Providence Water

20-YEAR INFRASTRUCTURE REPLACEMENT PLAN
2011-2030

December 2010

Cover: Rendering of Treatment Plant following completion of the Filter Rehabilitation and Influent Structure and Aerator upgrade projects.

PROVIDENCE WATER SUPPLY BOARD

INFRASTRUCTURE REPLACEMENT PLAN
For Fiscal Years 2011 Through 2030

Prepared In-House by the
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DECEMBER 2010

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Providence Water

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December 1, 2010

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 spanning from 2011 through 2030 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.

Since inception of our Infrastructure Replacement Program in 1996 we have invested approximately $191 million into our treatment plant, storage reservoirs, pump stations, dams, and transmission and distribution lines. Included in this plan, contained in the appendix of this document, is a report detailing the accomplishments of our infrastructure replacement program over the period from July 1996 through September 2010. It is our goal through these improvements, along with the ongoing planned improvements outlined in this plan submission, 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.

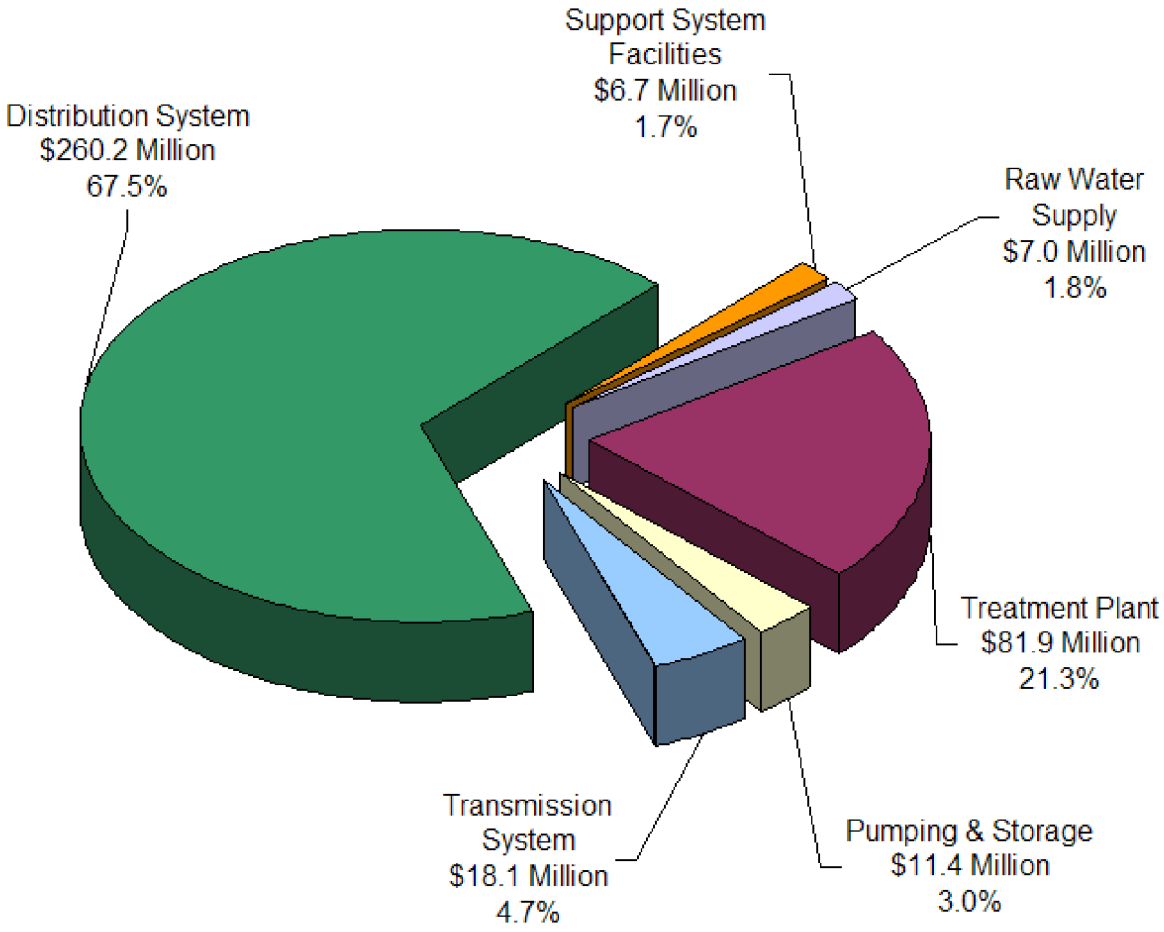
Respectfully,
PROVIDENCE WATER SUPPLY BOARD

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

Exhibit 1
Providence Water
20 Year IFR Expenditure Plan
Fiscal Years 2011 through 2030

	Total Amount	Budget 2011-2015	Budget 2016-2020	Budget 2021-2025	Budget 2026-2030
RAW WATER SUPPLY	6,950,000	3,650,000	1,850,000	800,000	650,000
TREATMENT PLANT	81,935,000	45,080,000	34,085,000	1,735,000	1,035,000
PUMPING AND STORAGE	11,425,000	1,500,000	3,625,000	6,150,000	150,000
TRANSMISSION SYSTEM	18,100,000	4,500,000	2,650,000	8,300,000	2,650,000
DISTRIBUTION SYSTEM	260,235,000	53,610,000	67,400,000	61,975,000	77,250,000
SUPPORT SYSTEMS AND FACILITIES	6,700,000	1,250,000	1,950,000	1,750,000	1,750,000
TOTAL	385,345,000	109,590,000	111,560,000	80,710,000	83,485,000

Exhibit 2
Providence Water
20 Year IFR Expenditures
Fiscal Years 2011 through 2030



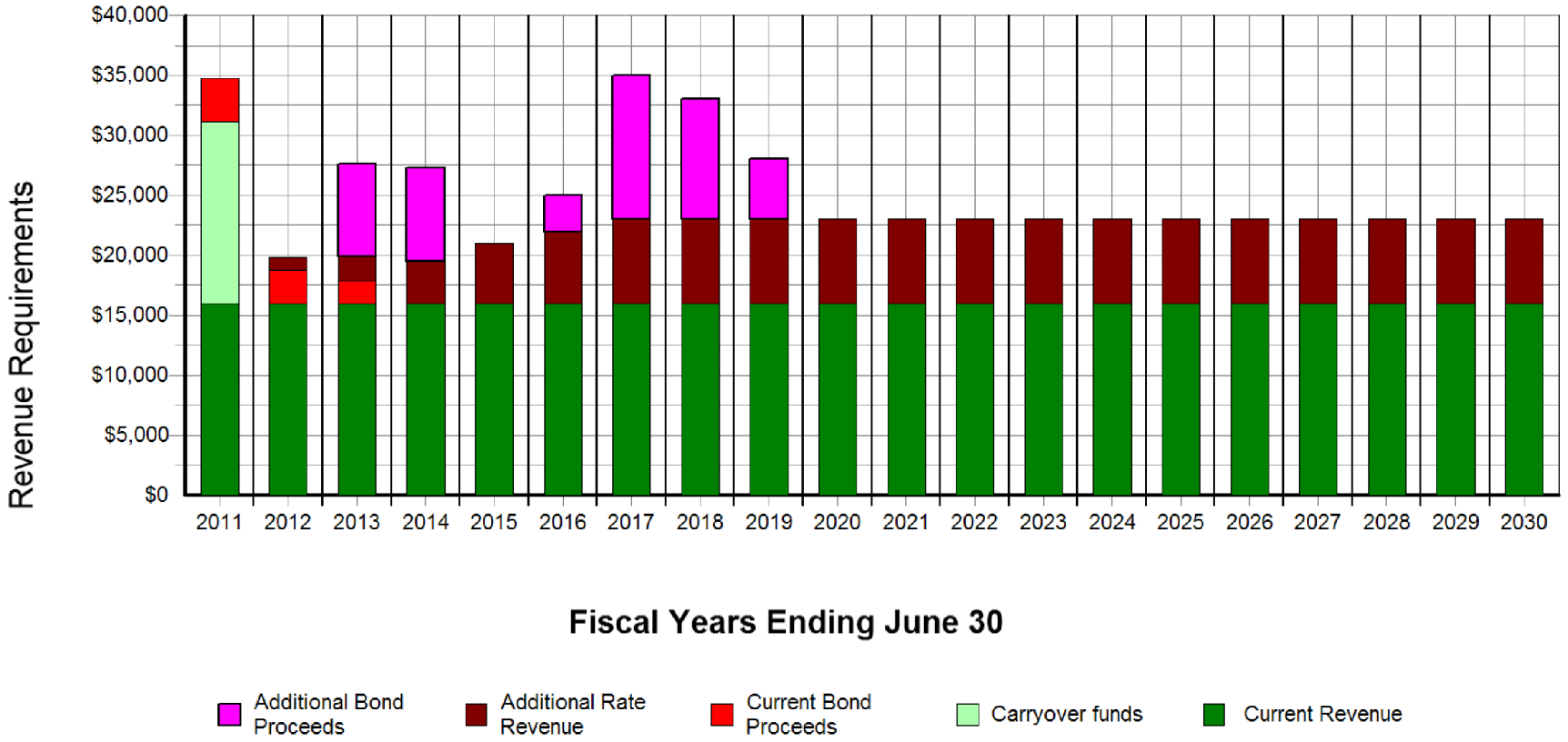
20 Year Investment - $385 million

Exhibit 3

Providence Water
Sources and Uses of Funds
IFR Funding & Expenditure Projections ($000's)
Fiscal Years 2011 through 2030

	2011-2015	2016-2020	2021-2025	2026-2030	2011-2030
	Phase 1	Phase 2	Phase 3	Phase 4	Total
Sources of Funding:					
Current Authorized Funding	$80,000	$80,000	$80,000	$80,000	$320,000
Current Bond Proceeds	8,300	0	$0	$0	8,300
Funds Available from Prior Years	15,123	0	$0	$0	15,123
Additional Rate Revenue	11,500	34,000	$35,000	$35,000	115,500
Additional Bond Proceeds	15,500	30,000	$0	$0	45,500
Total Sources of Funds	130,423	144,000	115,000	115,000	504,423
Uses of Funding:					
Cash Funded Construction Projects	$109,590	$111,560	$80,710	$83,485	$385,345
Existing Debt Service	18,742	14,689	14,689	14,689	62,809
Additional Debt Service	1,775	13,948	17,390	17,390	50,502
Total Uses of Funds	130,107	140,197	112,789	115,564	498,656
IFR Program Surplus/(Deficit)	$317	$3,804	$2,211	-$564	$5,767

Exhibit 4
Providence Water
IFR Funding Projections $(000's)
Fiscal Years 2011 through 2030



Infrastructure Replacement Plan FY 2011 through FY 2030

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 information for key components of the 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 summary of IFR program accomplishments with costs from fiscal years 1996 through 2010.

Section III - IFR Expenditure Plan - The section contains the projects and descriptions for the 20 Year IFR Expenditure Plan (fiscal years 2011 through 2030), the 5 Year IFR Expenditure Plan (fiscal years 2011 through 2015), and the 15 Year Expenditure Plan (fiscal years 2016 through 2030).

Section IV - Revenue Requirements - The sources and uses of funds for the 20 Year IFR Plan (fiscal years 2011 through 2030) and the IFR funding projections for the same period.

Appendix - The Comprehensive Clean Water Infrastructure Act of 1993, the Rules and Regulations for the Clean Water Infrastructure Plans, and the Infrastructure / Capital Program Report 1996 - 2010 (September 2010).

Section I

Facilities Description

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 Information – 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 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

Providence Water's sole source of supply 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

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.

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).

Crest elevation of the spillway is 284.00 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

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.

The dam impounding the waters in the Regulating Reservoir is an approximately 600 foot long earth embankment structure which includes a 260 foot long concrete overfall spillway. Elevation of the crest of the overfall is 285.50 feet (MHW).

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

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.

The dam forming Moswansicut Reservoir is a 450 feet long earth 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).

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 foot 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 with a steel sheeting and concrete corewall. The length of the dam is 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 are 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. The Raw Water Booster Pump Station is 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, 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 a 108-inch conduit and then 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

Ferric sulfate is added as a coagulant to the aerated water as it passes through the 108-inch conduit utilizing the pumped flash mix system. 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 and flocculation 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 cylindrical motion to the water. 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 manually by periodically draining and flushing the basins.

Filtration

Settled water travels from the basins through a 10-foot wide, 11-foot high rectangular concrete conduit to the plant's filters. Chlorine is added in this conduit for disinfection purposes. A second lime injection point is located in this conduit to raise the pH from 7.0 to 10.2. Carbon dioxide will be injected in this conduit to raise dissolved inorganic carbon (DIC) and alkalinity. 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 tri-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 control 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 filter backwash water is supplied by gravity via a 400,000 gallon wash water tank which is then discharged to the sludge lagoons.

Emergency Provisions

Emergency provisions at the plant include stand-by power and an emergency by-pass process that could allow chlorinated unfiltered water to flow to the system.

Electrical service is provided by a 23 kilo-volt (KV) transmission line to a 2.3 KV service to the treatment plant. The emergency electrical power at the plant is provided by a 600 KW diesel generator. This generator is capable of providing adequate power for treatment operations and life safety requirements during power outages. Redundant backup power for the system is also available through a 2000 KW diesel generator located at the Raw Water Booster Pump Station.

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 bulk 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.

Carbon Dioxide

A Carbon dioxide feed system is currently under construction under the Capital Program. Carbon dioxide will be added to the settled water to increase the levels of dissolved inorganic carbon (DIC) and alkalinity of the finished water in order to stabilize the pH throughout the distribution system. Carbon dioxide will be delivered in liquid form and will be stored in two storage tanks.

Chlorine

Chlorine is added to the settled water for disinfection. Chlorine is delivered to the plant in one ton containers which are transported to a storage room. The storage room is equipped with a ventilation system that would turn on and exhaust 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 paced to the metered effluent flow of the plant.

Solids Handling and Disposal

The treatment process 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 pushed and scoured using high pressure water and directed through drains in the basins where it then flows to off-site sludge settling 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 and control structures that allow the lagoons to be independently removed from service for dewatering and cleaning operations. Lagoons 1a and 1b are used to store the majority of water treatment sludge received by the lagoons. Lagoon 2 is used as a 'polishing' lagoon for further removal of sediments. 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 water 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 meet peak demand flows and to provide storage for emergency and fire fighting purposes.

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 is gravity fed and provides operational storage for the Low Service area of the distribution system. Water is supplied to the reservoir through aqueducts and transmission mains from the treatment plant.

Neutaconkanut Reservoir

Water continues to flow through the Neutaconkanut Conduit to the further downstream 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 provides operational storage for the gravity fed Low Service area and a portion of the pumped supply to the High Service area of the distribution 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 size of the reservoir to its current capacity. The facility provides operational, emergency, and fire storage to the High Service area of the distribution system.

Ridge Road Reservoir

The Ridge Road Reservoir has a capacity of 3.5 MG and provides operational, emergency, and fire storage for the Extra-High Service area of the distribution system. 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 enclosed underground concrete structure with a water depth of 20 feet and an overflow elevation of 485 feet mean high water (MHW). The facility provides operational storage for the Western Cranston area of the distribution system. Water is pumped to the reservoir by the Aqueduct Pump Station adjacent to the Aqueduct Reservoir.

PUMP STATIONS

In order to maintain an adequate supply of potable water at a sufficient pressure, Providence Water owns and operates ten 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 the head to provide adequate delivery capacity the water treatment plant under low reservoir water level conditions. The RWBPS is equipped with emergency power supplied by a 2000 KW diesel generator.

Dean Estates Pump Station

The Dean Estates Pump Station contains one 200 GPM pump, two 475 GPM pumps and two 1,200 GPM pumps. Emergency power is supplied by a 125 KW natural gas generator. The Dean Estates Pump Station serves the higher elevations in the Dean Estates and the Garden Hills subdivisions.

Greenville Avenue Pump Station

The Greenville Avenue Pump Station contains one 50 GPM jockey pump, three 320 GPM pumps, and one 750 GPM fire pump. 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 pumps water to Longview Reservoir and supplies water to the High Service area as well as the high pressure fire zone in downtown Providence.

Neutaconkanut Pump Station

The Neutaconkanut Pump Station contains four pumps with a pumping capacity of approximately 6,700 GPM each. A 1000 KW diesel generator supplies emergency power for the station. The station pumps water from the Neutaconkanut Reservoir and supplies water to Longview Reservoir and the High Service area.

Aqueduct Pump Station

The Aqueduct Pump Station contains four vertical turbine pumps with a pumping capacity of approximately 2,000 GPM each. A 600 KW diesel generator supplies emergency power for the station. The station pumps water to Lawton Hill Reservoir and the Western Cranston Service area.

Alpine Estates Pump Station

The Alpine Estates Pump Station contains one 100 GPM jockey pump and three 370 GPM domestic pumps. A 75 KW diesel generator supplies emergency power for the station. This station is currently out of service and serves as a back-up to the Cranston Commons Pump Station to provide water to the Alpine Estates subdivision in Western Cranston.

Ashby Street Pump Station

The Ashby Street Pump Station contains one 50 GPM jockey pump, two 100 GPM domestic pumps and one 750 GPM fire pump. Electrical power and emergency power is supplied to the station from the Neutaconkanut Pump Station. The station provides water to approximately 100 residential services in the Neutaconkanut Hill area in Johnston.

Cranston Commons Pump Station

The Cranston Commons Pump Station contains two 130 GPM jockey pumps and three 800 GPM domestic pumps. 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. The station provides water to Cranston Commons and Alpine Estates subdivision in Western Cranston.

TRANSMISSION AND DISTRIBUTION SYSTEM

Large diameter pipe conduits transfer raw 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 and 102-inch diameter Supplemental Tunnel and Aqueduct (STA).

Providence Water currently operates approximately 4 miles of concrete lined tunnel, 10 miles of concrete aqueduct, 114 miles of various sizes of transmission piping (16" to 66") and 885 miles of distribution piping (6" to 12").

Service Area

Providence Water supplies approximately 600,000 people in the State of Rhode Island with potable water through both its retail and wholesale customers.

The Retail Area

The retail service area consists essentially of all of Providence, Cranston, North Providence, and a significant portion of Johnston. The 74,000 retail service connections include residential, industrial, commercial, and fire service supplies.

The retail service area is divided into four major separate pressure zones: the Low Service, High Service, Extra High Service, and the Western Cranston water district.

The Low Service area comprises approximately 75% of the retail area and serves portions of Cranston, Johnston and Providence. The Low Service area is generally defined as the area within elevations 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 higher elevation sections of North Providence, Providence and the Town of Johnston. The High Service area is generally defined as the area within elevations 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 the approximate elevation of 305 feet MHW. 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 the water level is maintained at the approximate elevation of 397 feet MHW.

The Western Cranston water district encompasses 3.5% of the retail area. The pressure in this service area is maintained by the operating level at Lawton Hill Reservoir at the approximate elevation of 484 feet MHW. Water for this 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 in size, based upon customers' demands. Service connections are generally constructed of lead, copper, cast iron, or ductile iron. All services are metered.

The Wholesale Area

Providence Water wholesales water to nine water utilities in the Providence area. These include the Bristol County Water Authority (one interconnection), East Providence Water Division (one interconnection), Greenville Water District (one interconnection), Kent County Water Authority (three 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).

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 the plant's 36 master effluent meters. These meters are 12-inch venturi tube meters located on the effluent lines from the plant's filters. 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.

PROVIDENCE WATER
STATISTICAL INFORMATION
Exhibit 5

WATER SUPPLY SOURCES

	Watershed Area (Sq Miles)	Surface Area (Sq Miles)	Storage Capacity (MG)	Dam Length (feet)	Spillway Elevation (MHW)
Scituate Reservoir	92.8	5.30	37011	3200	284.00
Regulating Reservoir	22.3	0.38	428	340	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, filtration, disinfection, and fluoridation.

STORAGE FACILITIES

	Storage Capacity (MG)	Overflow Elevation (MHW)
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

PROVIDENCE WATER

STATISTICAL INFORMATION

Exhibit 5

PUMP STATIONS

Raw Water	2 - 30 MGD pumps; 2 - 50 MGD pumps; 2000 KW diesel generator
Dean Estates	1 - 200 GPM pump; 2 - 475 GPM pumps; 2 - 1,200 GPM pumps; 125 KW natural gas generator
Greenville Ave.	1 - 50 GPM jockey pump; 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	4 - 2,000 GPM pumps; 600 KW diesel generator
Alpine Estates	1 - 100 GPM jockey pump; 3 - 370 GPM pumps; 75 KW diesel generator
Ashby St.	1 - 50 GPM jockey pump; 2 - 100 GPM pumps; 1 - 750 GPM pump; emergency power provided by Neut. P.S. and generator.
Cranston Commons	2 - 130 GPM jockey pumps; 3 - 800 GPM pumps; emergency power provided by PS&G

TRANSMISSION AND DISTRIBUTION SYSTEM

4.5 miles - 90" Scituate Tunnel and Aqueduct

9.5 miles - 78" / 102" Supplemental Tunnel and Aqueduct

114 miles of transmission piping (16" to 66")

814 transmission valves

885 miles of distribution piping (6" to 12")

13,500 distribution valves

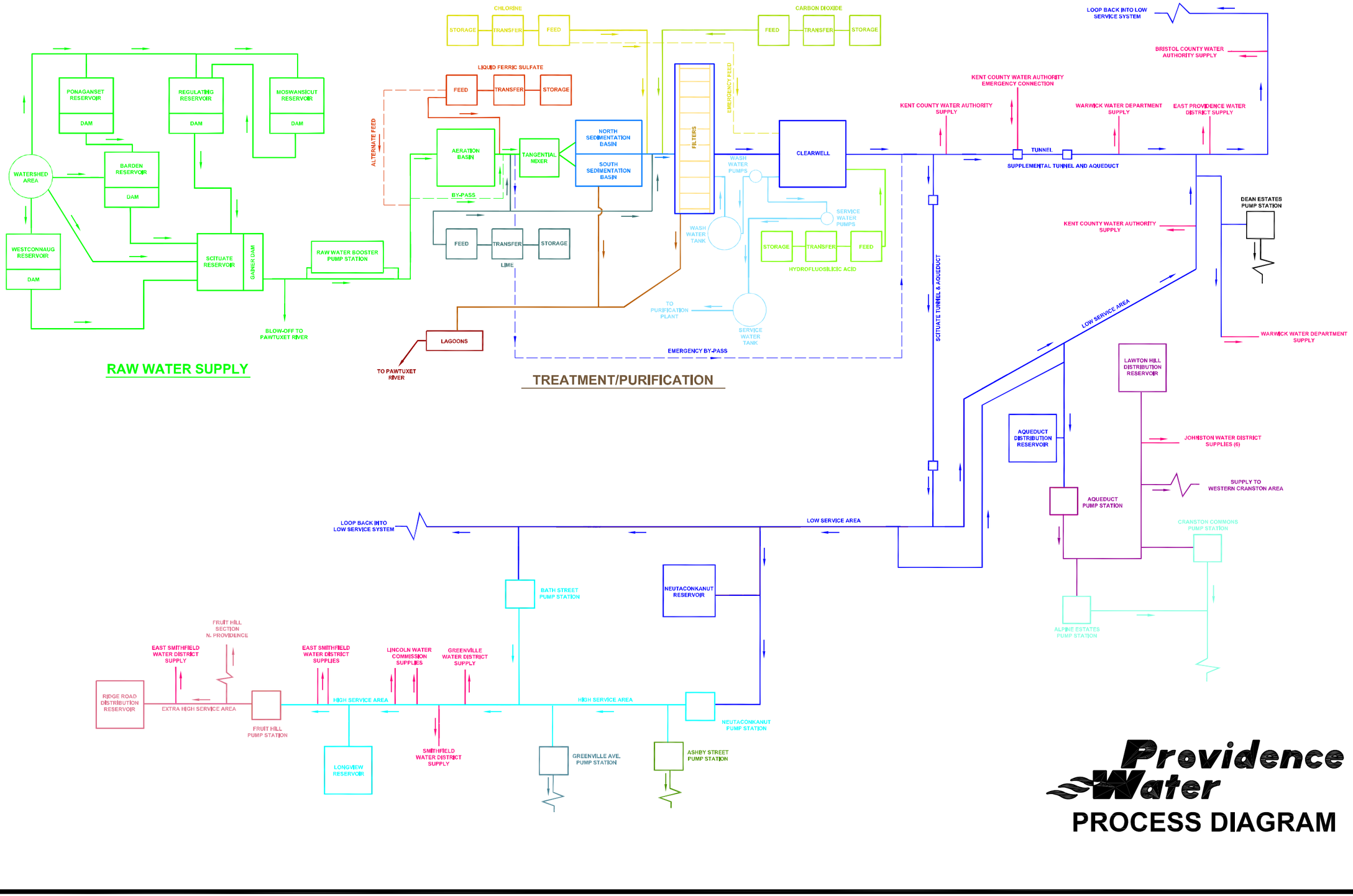
6,067 hydrants

74,000 service connections

WHOLESALERS

	Interconnections
Bristol County Water Authority	1
East Providence Water Division	1
Greenville Water District	1
Kent County Water Authority	3
Lincoln Water Commission	2
Smithfield Water Department	1
Warwick Water Department	2
Johnston Sewer and Water Department	6
East Smithfield Water District	3
Total	20

EXHIBIT 6



Providence Water

PROCESS DIAGRAM

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
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 has been reconstructed. Ponaganset Reservoir Dam has been rehabilitated and is in good condition. Barden, Westconnaug, and Moswansicut Reservoir Dams have been rehabilitated and are in excellent condition. Improvements to Regulating Reservoir Dam is in design and rehabilitation is needed to both the upstream and downstream slopes of the dam and at the outlet structure and spillway.
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	84	45	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. Electrical actuators were installed to operate the sluice gates. Instrumentation and telemetry have been replaced. The gatehouse is in need of architectural rehabilitation along with a replacement of the two existing cranes.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
RAW WATER SUPPLY				
60 inch Raw Water Influent Conduits	1926	85	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 was inspected and some of the exterior coating will need to be recoated. The cathodic protection system installed for the underground portion is in good working condition.
90 inch Steel Raw Water Influent Conduit	1926	85	50	Dates back to original plant construction. The 90" raw water conduit is in good condition. Minor internal surface imperfections were identified during a structural inspection and will be rehabilitated under the Influent Structure Rehabilitation project.
Raw Water Booster Pump Station	1966	45	50	The station is in relatively good condition. A 2000 kW generator was installed in 1996, replacing the old diesel generator. The electrical feeder lines to the 60" control valves from the station have been replaced and the valves are in good working condition. The suction and discharge valves, as well as the valve actuators for each of the booster pumps have been replaced. The motor control center has been replaced and the pumps rehabilitated. SCADA has also been added to this station. The station is in need of architectural rehabilitation.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS
BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
TREATMENT PLANT FACILITIES				
Treatment Plant Structure / Infrastructure	1926	84	50	The plant is generally in good condition with improvements made to the roof, lab, HVAC system, and electrical system. The public address system throughout the plant and forestry building is in the process of being replaced. The plant is in need of various architectural improvements.
Electrical Supply System - Treatment Plant	various	various	various	The overall system is in excellent condition. The feeder lines from the Hope substation to the treatment plant have been replaced. A 480-volt transformer and feed line has been installed at the treatment plant replacing the old 550V system. The old 175 kW generator was replaced with a 600 kW diesel generator.
Aeration	1926	85	5	The influent structure and aeration basin date back to the 1920s. Improvements to the aeration basin and influent structure are in design and rehabilitation will take place in the near future, consisting of the relocation and reconstruction of the basin, rehabilitation of concrete surfaces of the structures and conduits, replacement of the influent control valves, and reconstrruction work on the influent control chamber. Plant influent hydraulics will be improved by raising the overflow and aerator weirs.
Sedimentation Basins	1939	72	10	The concrete sedimentation basins at the plant consist of two large open water surface basins dating back to 1939. The concrete walls and slabs making up the basin have deteriorated over time. In light of the outmoded nature of this sedimentation process by today's standards, Providence Water is considering a new modern-design settling system to be installed in their place.
Filters and Appurtenances	1927/1943/1968	varies	5	Construction is in progress for the rehabilitation of all 18 filters at the treatment plant. Rehabilitation work consists of completely replacing the existing filters' valves, underdrains, washwater troughs, and media, and erecting a new superstructure to house the filters. In addition to the filter rehabilitation, all associated washwater and effluent piping and appurtenances are being replaced, including the replacement and relocation of the 48-inch washwater pipe.
Clearwell	1927/1943/1968	71	50	The exterior yard and the interior of the clearwell have been fully rehabilitated. The two venturi meters at the outlet have been rehabilitated.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
TREATMENT PLANT FACILITIES				
Wash Water System	1926 Tank 2004 Pumps	84 (Tank) 6 (Pumps)	50 (Tank) 30 (Pumps)	The pumps are in good condition. Concrete rehabilitative work was performed on the washwater tank. The washwater tank is in good condition.
Service Water System	1960 Tank 2004 Pumps	50 (Tank) 6 (Pumps)	50 (Tank) 30 (Pumps)	The pumps are in good condition. Magnesium anodes were installed in the tank for corrosion protection. The service water tank appears to be in good condition.
Ferric Storage/Transfer/Feed System	1997	13	10	The protective coating and insulation on the bulk storage tanks have shown wear and will need rehabilitative work.
Lime Storage/Transfer/Feed System Storage system Transfer system Feed system	 2006 2004 1998	 4 6 12	 20 20 <5	Due to the abrasive nature of lime, the pipe bends for the transfer system will need to be replaced eventually. The feed system is in need of replacement.
Chlorine Storage/Transfer/Feed System	1997	13	<5	Due to continually increasing safety concerns associated with bulk gaseous chlorine storage, the existing gaseous chlorine storage and feed systems will be replaced to a sodium hypochlorite system.
Fluoride Storage/Transfer/Feed System	2005	5	20	The system is in excellent operational condition. Only minor repairs are anticipated during the next 10 years.
Sludge Handling / Disposal System	2004	6	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 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	2010	0	10	The SCADA system is new and in excellent condition.
Carbon Dioxide Storage/Feed System	2010	0	20	The Carbon Dioxide system is new and in excellent condition.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
TRANSMISSION SYSTEM				
90-inch Scituate Tunnel and Aqueduct	1925	85	75	The entire 4.5 mile 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. Further rehabilitative work will be required in the tunnel section consisting of contact grouting to fill various voids between the concrete tunnel and the bedrock.
Supplemental Tunnel and Aqueduct (102" & 78")	1970	40	50	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. Because of prior deficiencies encountered on these pipelines, a program has been adopted in which the pipelines are inspected and repairs are conducted on a five year interval basis. In addition to the inspections, a fiber optic acoustic monitoring system has been installed in the 102" pipeline that continually monitors the pipeline for wire breaks.
Transmission Mains (16" to 66")	1871-2006	76	various	Some of the mains are older than 100 years and will eventually need to be replaced. No mains have been identified needing replacement in the short term.
Transmission Valves (16" to 60")	1871-2006	38	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	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
DISTRIBUTION SYSTEM				
Distribution Mains (6" to 12")	1871-2010	73	various	Approximately 27% of mains consist of unlined cast iron pipe installed prior to 1900. Main replacements are necessary.
Distribution Valves (6" to 12")	1871-2010	65	various	Of the approximately 13,500 valves in the system, 1,900 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	1871-2010	55 (all) 100 (lead)	various	Of the approximate 74,000 services in the system, over 23 percent are lead. Plans are to continue replacing these services under the Lead Service Replacement Program. Other lead services will be replaced on main replacement projects.
Hydrants	1941-2010	33	various	Plans are to replace all hydrants greater than 75 years old with new breakaway style hydrants.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS
BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
PUMPING AND STORAGE				
Aqueduct Reservoir and Gatehouse	1962	48	50	The reservoir and gatehouse are in good condition. The reservoir has been fully rehabilitated; exterior waterproofing was applied. Cracks and construction joints on the interior of the structure were sealed.
Neutaconkanut Reservoir and Gatehouse	1928	82	50	Dates back to the 1920s. The reservoir and gatehouse has been rehabilitated under a recent contract. Cracks and construction joints on the interior of the structure were sealed.
Longview Reservoir and Gatehouse	1928, 1990	82	50	The reservoir and gatehouse are in good condition. The reservoir has been fully rehabilitated; exterior waterproofing was applied. Cracks and construction joints on the interior of the structure were sealed.
Ridge Road Reservoir	1989	21	50	The storage tank is in good condition. The tank has some exterior cracking which needs to be rehabilitated.
Lawton Hills Reservoir	1972	38	50	A brief diving inspection was completed in 2004 and found the tank in relatively good condition. Some concrete rehabilitative work will be needed inside the reservoir.
Dean Estates Pump Station	1982	28	1	Construction has begun to rehabilitate the pump station and to combine the Garden Hills and Dean Estates pressure zones into a single pressure zone. Work includes installation of new VFD turbine pumps, elimination of the hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements.
Fruit Hill Pump Station	1989	21	10	The station is in good condition. It is anticipated that the pumps will need to be replaced along with upgrades to the various mechanical and electrical systems, including architectural improvements.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
PUMPING AND STORAGE				
Bath Street Pump Station				The pump station is in good condition. Rehabilitation of the pump station was completed in 1999 which included replacement of the pumps, suction and discharge piping, instrumentation and electrical system upgrades, architectural/structural improvements, and installation of an emergency power generator.
Building	1928	82	40	
Pumps	1999	11	19	
Neutaconkanut Pump Station				The pump station is in good condition. Rehabilitation of the pump station was completed in 1999 which included replacement of the pumps, suction and discharge piping, instrumentation and electrical system upgrades, architectural/structural improvements, and installation of an emergency power generator.
Building	1935	75	40	
Pumps	1999	11	19	
Greenville Ave Pump Station				The pump station is in good condition. It is anticipated that various mechanical, electrical, and architectural improvements will be needed.
Building	1994	17	10	
Pumps	1994	17	10	
Aqueduct Pump Station				The pump station is new and is in excellent condition.
Building	1972	38	40	
Pumps	2006	4	26	
Alpine Estates Pump Station	1988	23	7	The station needs upgrading of the electrical supply, new valves and piping, 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	12	18	This pump station is in excellent condition. It is anticipated that various mechanical, electrical, and architectural improvements will be needed.
Cranston Commons Pump Station	1996	15	15	The pump station is in good condition. 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.

Exhibit 7
PROVIDENCE WATER
SUMMARY OF PRINCIPAL COMPONENTS BY FACILITY CATEGORY

PRINCIPAL COMPONENTS BY CATEGORY	Installation Date(s)	Age of Component	Approx. Practical Remaining Life (years)	Assessment
SUPPORT SYSTEMS & FACILITIES				
Forestry Garage	1962	49	15	Various rehabilitative work has been conducted on the facility. The building is 49 years old and will require architectural and mechanical rehabilitation.
Academy Ave Administration Building	1954	57	5	Various rehabilitative work has been conducted on the facility. The building is 57 years old and will require architectural and mechanical rehabilitation. A new administration building is needed.
Aqueduct Reservoir Administration Building	1997	14	5	The building is a one level office building constructed in 1998. The facility is functional and will require minor architectural and mechanical rehabilitation.
Watershed Storage Facility	2009	2	40	Th e building is pre-engieered metal frame storage building constructed in 2009. The facility is in excellent condition.

Section II
IFR Program Accomplishments

Section II – IFR Program Accomplishments

Summary of IFR Program Accomplishments (Fiscal Years 1996 through 2010)

Exhibit 8 – IFR Expenditures for Fiscal Years 1996 through 2010 by Facility Type Pie Graph

Exhibit 9 – IFR Expenditures for Fiscal Years 1996 through 2010 by Year Bar Graph

SUMMARY OF IFR PROGRAM ACCOMPLISHMENTS - 1996 - 2010

Providence Water is a full service utility supplying drinking water and fire protection to four (4) retail customer communities of Providence, Cranston, North Providence, and Johnston and to nine (9) wholesale customer water systems representing 60 percent of the State's population. The source water comes from the Scituate Reservoir complex and 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. The utility and its workforce operate and maintain a vast system of mains, hydrants, service connections, and meters with a multitude of appurtenances.

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 of the State's water infrastructure systems, adopted the Comprehensive Clean Water Infrastructure Act in accordance with Chapter 46-15.6 of the General Laws of the State of Rhode Island. The law set aside portions of water revenues for long-term planned infrastructure replacement programs.

In accordance with the requirements of the legislation, a water supplier subject to Chapter 46-15.6 is required to develop and maintain an infrastructure replacement plan to be submitted to the Rhode Island Department of Health once every five years for review and approval. In accordance with the legislation, Providence Water prepared and submitted its first 20-year Infrastructure Replacement Plan in 1996. Subsequent 5-year plan updates were submitted thereafter in 2001 and 2006, with this being our fourth plan submission.

Since submission of our first plan in 1996, we have made substantial improvements to our infrastructure, having reinvested approximately $191 million into the system, with $64.5 million in improvements in the distribution system, $56.6 million into our water treatment facilities, $27.6 million into the transmission system, $11.8 million into pumping and storage facilities, $9.9 million into raw water supply facility structures, and $6.3 million into support facilities. Since the inception of our infrastructure replacement effort which began in 1990, approximately $200 million has been invested into system improvements.

In August 2007, we began the replacement of lead services in the distribution system on a large-scale basis to comply with the requirements of the Lead and Copper Rule. We have been replacing or cleaning and lining water mains where water quality complaints and low-pressure problems have been identified along with older and / or defective hydrants and valves in the system. All water meters have been replaced with new radio-frequency transmission meters providing automatic reading capabilities.

At our treatment plant, the chemical bulk storage / transfer / feed systems for chlorine, lime, ferric sulfate, and fluoride have been rehabilitated or replaced. Additional improvements have been made to the ferric sulfate feed system with the incorporation of a pumped flash mixer system to optimize coagulation. Concrete rehabilitative work has been performed on the interior of the clearwell, the effluent clearwell yard, the emergency bypass, and the wash water tank. The testing laboratory has been fully renovated to include a new floor, lighting, laboratory benches, HVAC, and electrical upgrades. Electrical upgrades have been done, essentially providing a completely new and reliable electrical feed service system to the plant. The old electrical substation dating back to the 1920's that fed the plant has been replaced with a new modern substation, the underground electrical feeders to the treatment plant have been replaced, and a new 480-volt transformer installed. The antiquated and obsolete 550-volt service has been replaced with a standard 480-volt service, the scope of work including construction of a new electrical room dedicated solely to electrical panelboards and switchgear, and the old 175 kW emergency power generator has been replaced with a new 600 kW generator. Improvements have been made to the plant's HVAC system. A new SCADA (Supervisory Control and Data Acquisition) system was completed in 2000 replacing the old analog Central Control Board system, and has been replaced again in 2010 to keep up with the changing hardware and software technology. All of the instrumentation and remote telemetry units (RTU's) have been replaced with programmable logic controllers (PLC's) for increased security, more efficient data transmission, and lower operating and maintenance costs.

In our transmission system, our problematic 102" aqueduct has been inspected at 5-year intervals since its catastrophic failure in November 1996. Substantial rehabilitation work has been performed on the line as the result of significant deterioration uncovered in each of the inspections. A third inspection which commenced in 2010 is underway. The 90" aqueduct has

been inspected with various concrete rehabilitative work performed. The first ever inspection of the 78" aqueduct has been conducted and pipe sections found to be severely deteriorated were rehabilitated. Valves 16" and larger, older than 75 years, and valves found to be defective have been replaced with new butterfly valves.

In our pumping and storage system the Neutaconkanut and Bath Street pump stations have been completely rehabilitated and the Aqueduct pump station replaced. The storage reservoirs at Longview, Aqueduct, and Neutaconkanut have all been fully rehabilitated.

At our raw water facilities, all sluice gates and stop shutters at the Gainer Dam gatehouse have been replaced. The Raw Water Booster pump station motor control center has been replaced and the old obsolete 1750 kW generator replaced with a new 2000 kW unit. Gainer Dam at the Scituate Reservoir, and the dams at Ponaganset Reservoir, Barden Reservoir, Westconnaug Reservoir, and Moswansicut Reservoir have all undergone rehabilitative work.

At our support facilities, offices have been renovated at Academy Avenue, underground fuel storage tanks at various facilities have been replaced with new above-ground tanks, all 27 Providence Water facility structures were brought into compliance with the amended Rhode Island Fire Safety Code, and the watershed storage facility used to house equipment and supplies has been replaced. Fencing has been replaced and access roads improved at a number of the various support facilities.

These improvements, along with the ongoing planned improvements outlined in this 2010 plan submission, will safeguard the integrity of our water supply for generations to come.

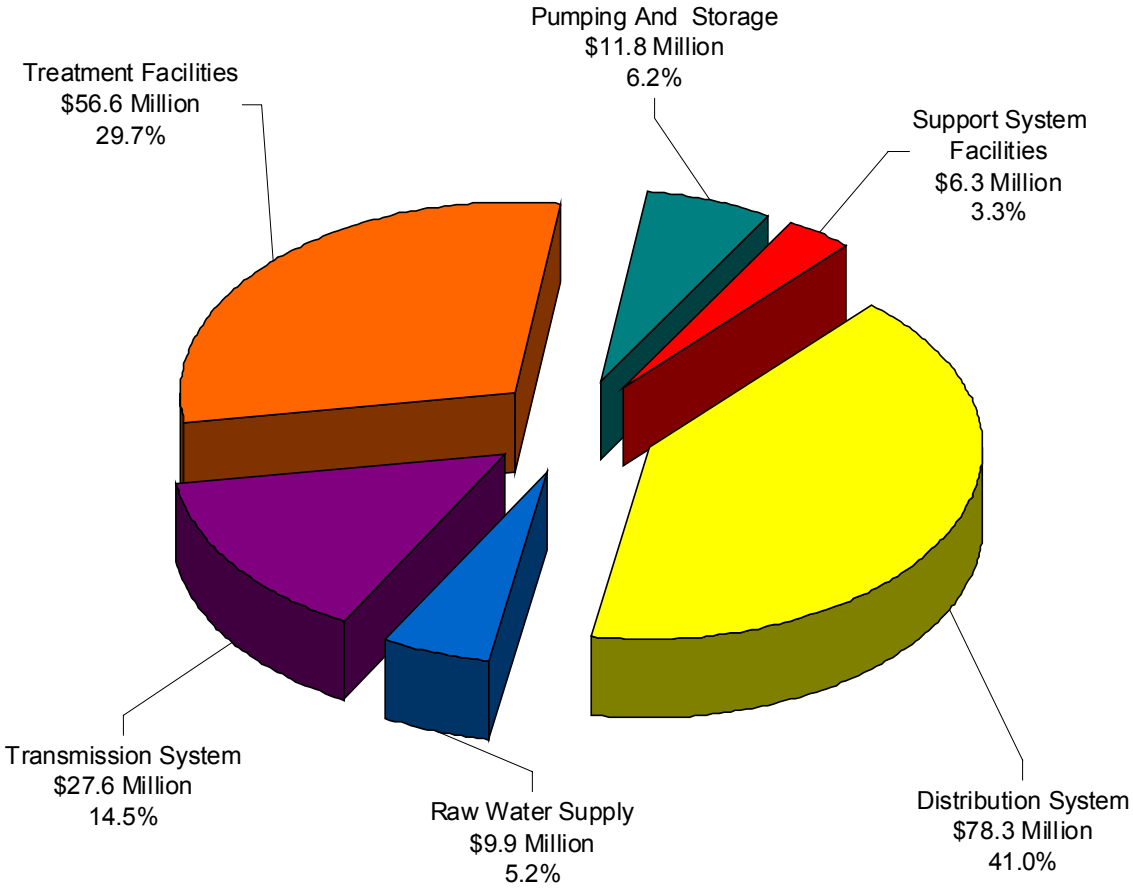
Every six months, Providence Water submits a project status report of its ongoing IFR/CIP program to the Rhode Island Public Utilities Commission. The latest report, submitted in September 2010, detailing our IFR and CIP accomplishments from 1996 through June 2010 is included for reference in the Appendix of this report.

Exhibit 8

Providence Water

IFR Expenditures

Fiscal Years 1996 to 2010*



Total Investment Into System $190.5 MIL

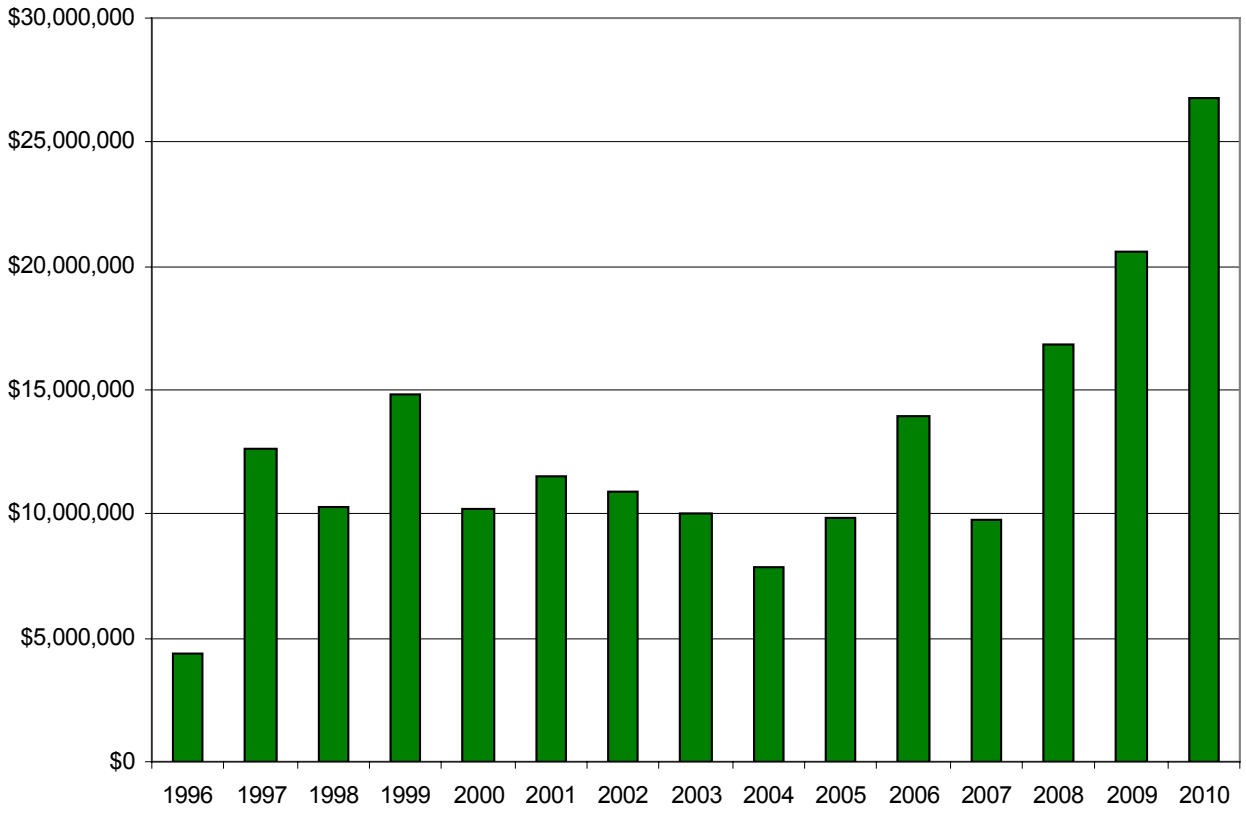
*Through June 30, 2010

Exhibit 9

Providence Water

Summary of IFR Expenditures

Fiscal Years 1996 to 2010



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	$13,996,118
2007	$9,746,919
2008	$16,854,654
2009	$20,622,218
2010	$26,790,595
Total to Date	$190,534,208

Section III
IFR Expenditure Plan

Section III – IFR Expenditure Plan

Background – IFR Needs and Expenditure Plan

Exhibit 1 – 20-Year IFR Expenditure Plan - Fiscal Years 2011 through 2030 - The twenty year infrastructure replacement expenditure plan is a summary of forecasted expenditure needs for the next twenty years, from fiscal year 2011 (ending June 30, 2010) through FY 2030 (ending June 30, 2030) 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.

Exhibit 2 – 20-Year IFR Expenditure Plan – Fiscal Years 2011 through 2030 Pie chart – Graphical representation of 20 Year IFR Expenditure Plan.

Exhibit 10 – 5-Year IFR Expenditure Plan Fiscal Years 2011 through 2015 - The Five Year Expenditure Plan is a detail of the planned infrastructure replacement program over the five year period from FY 2011 through FY 2015. 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.

Exhibit 11 – 5-Year Planned IFR Expenditures for Fiscal Years 2011 through 2015 Pie Chart – Graphical Representation of 5 Year IFR Expenditure Plan

Exhibit 12 - 5-Year IFR Project Overview Fiscal Years 2011 through 2015 - A brief narrative overview of the scope of each project for the 5 Year IFR Expenditure Plan.

Exhibit 13 - 15 Year IFR Expenditure Plan – Fiscal Years 2016 through 2030 - The Fifteen Year Expenditure Plan is a summary of the planned infrastructure replacement program over the fifteen year period from Fy 2016 through Fy 2030. 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.

Exhibit 14 - 15 Year IFR Project Overview Fiscal Years 2016 through 2030 - A brief narrative explanation of the scope of anticipated replacement work associated with each major component of the system for the 15 Year IFR Expenditure Plan..

Background - IFR Needs and Expenditure Plan

The plans contained herein encompass the five (5), and twenty (20) year projections of our infrastructure replacement needs and expenditures. The five-year plan is organized by specific projects, with projects grouped according to functional categories over the 5-year period from FY 2011 through FY 2015. The subsequent 15-year period of the fifteen 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 2016 through FY 2030. The 20-year plan summary is a composite of system needs and expenditure projected over the next twenty years (fiscal years 2011 through 2030), aggregated by major system category into four separate five-year plan increments.

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.

This is the fourth plan being submitted to the Rhode Island Department of Health (RIDOH) by Providence Water since enactment of the regulations. On February 29, 1996, Providence Water submitted its first 20-Year Infrastructure Replacement (IFR) plan to RIDOH. Our second IFR plan was submitted March 30, 2001, and our third on March 23, 2006. In accordance with the regulations, each plan identified needed system improvements over each ensuing 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 to June 30, 2010, we have reinvested $190.5 million into the system, with $64.5 million in improvements in the distribution system, $56.6 million in water treatment facilities, $27.6 million in the transmission system, $11.8 million in pumping and storage facilities, $9.9 million in reservoirs and dams, $13.8 million in meter

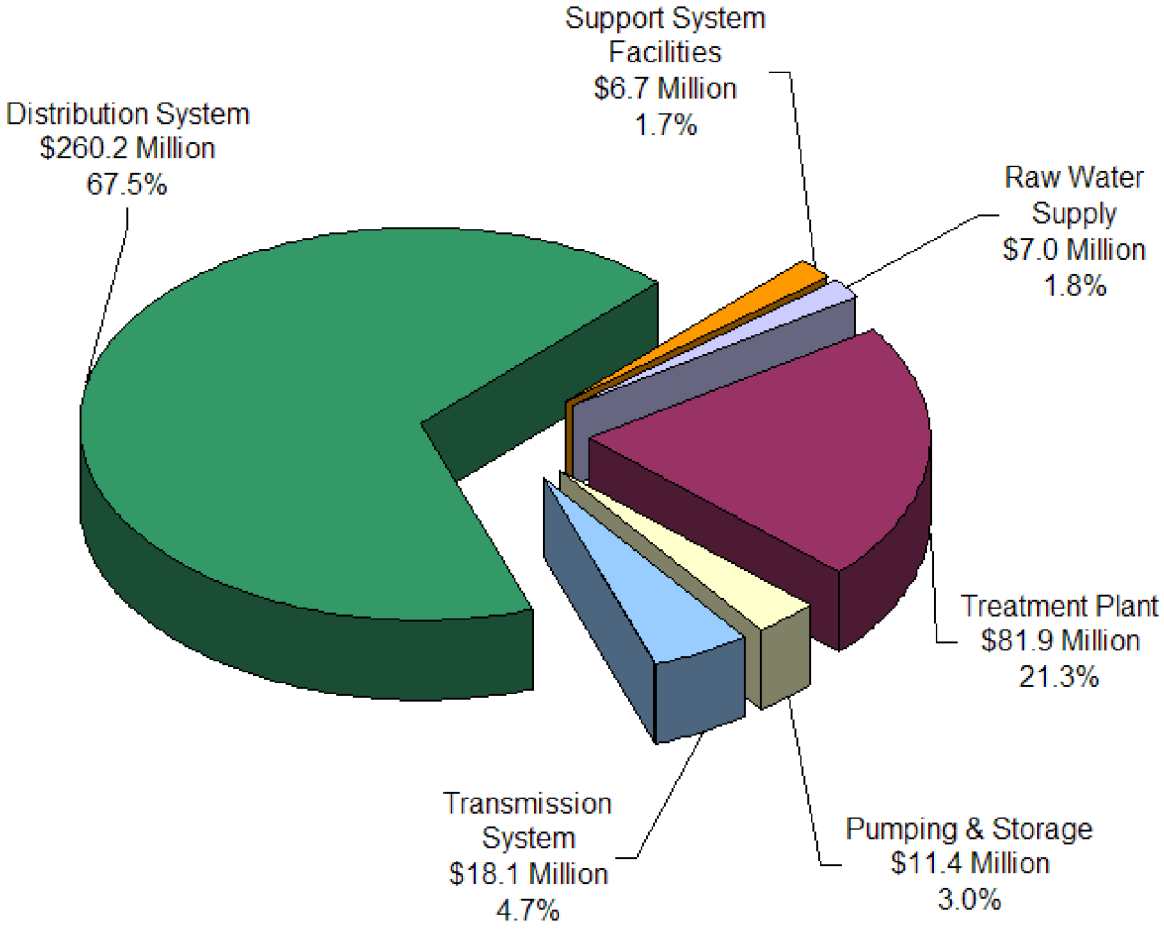
replacements, and $6.3 million into support facilities. Since the inception of our program of infrastructure replacements in 1990, nearly $200 million has been spent in improving the system.

Our plan addresses $426 million in needed improvements to the system over the next twenty-year period, with $110 million of that scheduled over the first five-year period at the treatment plant and within the distribution system alone. As with our previous plan, the latter years of this plan emphasize a major shift in concentration of work into the distribution area. The oldest portions of our distribution system date back 140 years, with approximately 27 percent of our water mains installed in the 1800's. To ensure the integrity and reliability of the system into the future, the upgrading and replacement of distribution mains and their appurtenances is to become one of the major focuses of our Infrastructure Replacement Program as we move forward.

Exhibit 1
Providence Water
20 Year IFR Expenditure Plan
Fiscal Years 2011 through 2030

	Total Amount	Budget 2011-2015	Budget 2016-2020	Budget 2021-2025	Budget 2026-2030
RAW WATER SUPPLY	6,950,000	3,650,000	1,850,000	800,000	650,000
TREATMENT PLANT	81,935,000	45,080,000	34,085,000	1,735,000	1,035,000
PUMPING AND STORAGE	11,425,000	1,500,000	3,625,000	6,150,000	150,000
TRANSMISSION SYSTEM	18,100,000	4,500,000	2,650,000	8,300,000	2,650,000
DISTRIBUTION SYSTEM	260,235,000	53,610,000	67,400,000	61,975,000	77,250,000
SUPPORT SYSTEMS AND FACILITIES	6,700,000	1,250,000	1,950,000	1,750,000	1,750,000
TOTAL	385,345,000	109,590,000	111,560,000	80,710,000	83,485,000

Exhibit 2
Providence Water
20 Year IFR Expenditures
Fiscal Years 2011 through 2030



20 Year Investment - $385 million

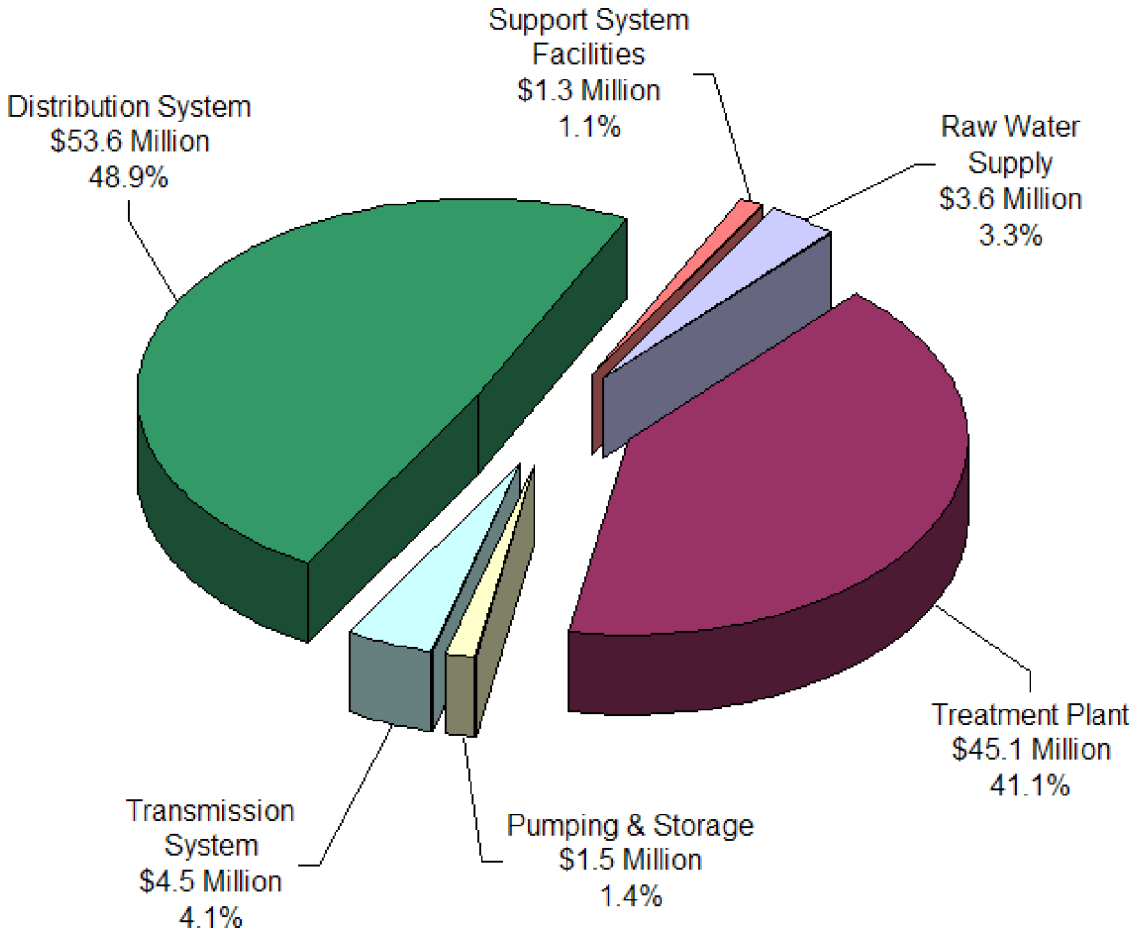
Exhibit 10
Providence Water
5 Year IFR Expenditure Plan
Fiscal Years 2011 through 2015

	Total Amount	Budget 2011	Budget 2012	Budget 2013	Budget 2014	Budget 2015
RAW WATER SUPPLY						
Reservoirs, Dams, and Watershed						
Regulating Reservoir dam rehabilitation	**1,200,000**		300,000	900,000		
Gainer Dam Spillway Rehabilitation	**300,000**		300,000			
Large dam improvements	**250,000**	50,000	50,000	50,000	50,000	50,000
Secondary dam improvements	**850,000**		100,000	300,000	450,000	
Watershed fencing, fire lanes, property rehabilitation	**250,000**	50,000	50,000	50,000	50,000	50,000
Raw Water Structures and Conduits						
Meter & junction chambers rehabilitation	**700,000**	700,000				
60" influent conduits - inspection	**50,000**		50,000			
90" influent conduit rehabilitation	**50,000**		50,000			
Raw Water Supply Total	**3,650,000**	**800,000**	**900,000**	**1,300,000**	**550,000**	**100,000**
TREATMENT PLANT						
Plant Influent and Aerator						
Influent structure rehabilitation	**330,000**	75,000	130,000	75,000	50,000	
Aerator / Influent actuators and valves replacement	**710,000**	90,000	330,000	240,000	50,000	
Influent structure - replace drain and bypass valves	**1,090,000**	140,000	520,000	380,000	50,000	
Influent / Effluent aerator conduits Inspect / Rehabilitate	**165,000**	35,000	50,000	55,000	25,000	
Aeration basin concrete rehabilitation	**800,000**	100,000	350,000	300,000	50,000	
Aeration basin - replace piping, nozzles, and drain valves	**1,200,000**	150,000	550,000	450,000	50,000	
Aerated, Settled, and Filter Influent Conduits						
Settled water conduit - installation of access hatch	**100,000**	50,000	50,000			
Concrete conduits inspect / rehabilitate	**1,100,000**	100,000	550,000	400,000	50,000	
Influent venturis inspection	**500,000**	50,000	200,000	200,000	50,000	
Emergency bypass - clean tunnel and install sluice gate	**75,000**		75,000			
Chemical Storage, Transfer, and Feed Systems						
Chlorine system upgrades	**2,500,000**			250,000	1,000,000	1,250,000
Ferric system upgrades	**250,000**		250,000			
Lime system upgrades	**900,000**	100,000	400,000	400,000		
Filters						
Filter replacement (including valves & piping)	**29,000,000**	9,000,000	7,000,000	5,000,000	4,000,000	4,000,000
Treatment process pilot model	**150,000**	100,000	50,000			
Inspect wash water system	**5,000**			5,000		

Exhibit 10
Providence Water
5 Year IFR Expenditure Plan
Fiscal Years 2011 through 2015

	Total Amount	Budget 2011	Budget 2012	Budget 2013	Budget 2014	Budget 2015
Building, Support, and Operational Systems						
Treatment plant building rehabilitation	**250,000**	50,000	50,000	50,000	50,000	50,000
PW lab / equipment Improvements	**250,000**	50,000	50,000	50,000	50,000	50,000
SCADA / Control system upgrades	**700,000**	600,000	25,000	25,000	25,000	25,000
Inspect service water system	**5,000**			5,000		
Sludge removal and disposal	**5,000,000**	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Treatment Plant Total	**45,080,000**	**11,690,000**	**11,630,000**	**8,885,000**	**6,500,000**	**6,375,000**
PUMPING AND STORAGE						
Neutaconkanut reservoir rehabilitation	**100,000**	100,000				
Dean Estates pump station upgrades	**1,200,000**	1,200,000				
Various pump station improvements	**100,000**	20,000	20,000	20,000	20,000	20,000
Storage tanks inspections / improvements	**100,000**		50,000	50,000		
Pumping and Storage Total	**1,500,000**	**1,320,000**	**70,000**	**70,000**	**20,000**	**20,000**
TRANSMISSION SYSTEM						
102" aqueduct inspection	**1,500,000**	1,500,000				
78" aqueduct inspection	**700,000**			700,000		
90" aqueduct inspection	**500,000**				500,000	
66", 60", 48" transmission mains inspections	**50,000**			50,000		
16" and larger valves replacements	**1,750,000**		250,000	500,000	500,000	500,000
Transmission System Total	**4,500,000**	**1,500,000**	**250,000**	**1,250,000**	**1,000,000**	**500,000**
DISTRIBUTION SYSTEM						
Replace / Upgrade water mains	**23,000,000**	5,500,000	5,500,000	4,000,000	4,000,000	4,000,000
Replace Distribution Valves	**500,000**	100,000	100,000	100,000	100,000	100,000
Replace lead services	**27,600,000**	4,200,000		7,700,000	7,800,000	7,900,000
Replace fire hydrants	**1,000,000**	200,000	200,000	200,000	200,000	200,000
Valve data collection program	**1,500,000**	750,000	750,000			
Leak detection	**10,000**	10,000				
Distribution System Total	**53,610,000**	**10,760,000**	**6,550,000**	**12,000,000**	**12,100,000**	**12,200,000**
SUPPORT SYSTEM FACILITIES						
Building and facilities rehabilitation	**1,000,000**	200,000	200,000	200,000	200,000	200,000
Facilities fencing and roads rehabilitation	**250,000**	50,000	50,000	50,000	50,000	50,000
Support System Facilities Total	**1,250,000**	**250,000**	**250,000**	**250,000**	**250,000**	**250,000**
TOTAL	**$109,590,000**	**$26,320,000**	**$19,650,000**	**$23,755,000**	**$20,420,000**	**$19,445,000**

Exhibit 11
Providence Water
5 Year IFR Expenditures
Fiscal Years 2011 through 2015



5 Year Investment - $109.6 million

EXHIBIT 12 – 5-Year IFR Project Overview - FY 2011 through 2015

RAW WATER SUPPLY

Reservoirs, Dams, and Watershed

Regulating Reservoir Dam Rehabilitation

The dam was inspected in 2004 and needed rehabilitative work was identified from the inspection. Design is in progress for improvements to include regrading and providing armor protection along both the upstream and downstream slopes, repairing/replacing the existing stone walls along both the upstream and downstream slopes, inspecting and rehabilitating the concrete spillway, rehabilitating the concrete outlet structure, and rehabilitating the current drainage system along the length of the dam.

Gainer Dam Spillway Rehabilitation

The upstream face of the spillway is exhibiting signs of wear. Plans are to completely replace all of the old unsound concrete along the upstream face of the spillway with a new concrete surface.

Large Dam Improvements

Six dams 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 that are conducted on a quarterly basis.

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. Plans are to rehabilitate several of the secondary dams based on prior inspections. In addition, plans are to inspect the remaining smaller secondary dams along the watershed. This will establish a scope of work in the subsequent years of the twenty-year plan to address needed improvements to extend their useful lives.

Watershed Fencing, Fire Lanes, Property Rehabilitation

The fences and access roads, much of which are 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 condition assessments.

Raw Water Structures and Conduits

Meter and Junction Chambers Rehabilitation

A construction contract has been awarded for rehabilitation of the Meter Chamber structure at the Scituate Reservoir Dam which includes replacing the existing exterior rubber roof membrane, removing and replacing the damaged sections of fence along the roof and injecting construction joints to stop leakage of groundwater into the tunnel. 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, 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. The exterior coating of the 60" conduits will be rehabilitated as necessary, and the partially submerged concrete filled cast iron pipe support columns will be replaced with reinforced concrete columns.

At the junction chamber, a construction contract has been awarded for exterior rip-rap improvements, 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, replacing the air release/vacuum valve assemblies, installing new lighting to improve lighting conditions inside and outside the structure, and rehabilitation of the exterior coating of the 60" conduits.

60" Influent Conduits - Inspection

Plans are to inspect the interior and exterior of the conduits every ten years. Inspection of the exposed piping consists of evaluating the condition of the exterior coating and an internal pipe assessment. Inspection of the underground pipeline consists of an over-the-line survey, an evaluation of soils along the pipeline, soil resistivity testing, an internal pipeline inspection, and evaluation and testing of the existing cathodic protection system. As the need for remedial work cannot be anticipated in advance, the budgeted amount shown for this project is for the inspection only.

90" Influent Conduit - Rehabilitation

The 90" influent conduit that transports raw water from Gainer Dam to the treatment plant is approximately 85 years old. The pipeline was recently inspected. Plans are to rehabilitate the concrete lining as identified during the inspection / assessment phase.

TREATMENT PLANT

Plant Influent and Aerator

Design is substantially in progress. The project is comprised of the following six sub-projects.

Influent Structure Rehabilitation

The influent structure is a reinforced concrete structure which has been in service for approximately 85 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. The overflow weir in the influent structure will be raised to increase hydraulic capacity for water influent through the structure. A masonry structure will be constructed on top of the existing footprint of the structure to protect the new actuators and electrical equipment from the elements.

Aerator / Influent Actuators and Valves Replacement

The 4 electrically operated 36-inch butterfly valves for the aerators will be replaced due to their age and condition. This project also consists of replacing the electric actuators, electrical conduits, power wiring and disconnects, and incorporating the new valve operators into the existing SCADA system.

Influent Structure - Replace Drain and Bypass Valves

Four 36-inch bypass gate valves allow diversion of influent water to bypass the aeration basin. Three 36-inch by 36-inch drain sluice gates are used to drain the aerator effluent conduit, influent control structure, influent tunnel, settled water conduit, and the mixer. A 72-inch by 72-inch influent venturi sluice gate was used during periods of extremely low influent flow for the purpose of diverting influent water through the south venturi meter to maintain flow meter accuracy. The valves, valve stems and operators are all approximately 85 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 consists of the replacement of the 4 bypass gate valves, the 3 drain sluice gates, the north influent venturi sluice gate, and all valve stems and guides. A new 72-inch by 72-inch sluice gate will be installed at the south venturi meter

entrance to provide the ability to isolate the influent control chamber from the downstream conduits. 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

An internal inspection of the steel and concrete influent and effluent aerator conduits, and an external inspection of the steel conduits, as well as structural evaluations of the steel and concrete conduits revealed areas that require rehabilitation addressed under this project.

Aeration Basin Concrete Rehabilitation

The aeration basin is a reinforced concrete lined basin within which the influent water aeration process takes place. The concrete panels forming the basin have settled and shifted, resulting in an uneven surfaces and exposed joints. The concrete is also severely deteriorated due to long term exposure to weather and treatment chemicals. This project includes the complete replacement and relocation of the aeration basin in a westerly direction away from its current location. This project also includes raising the elevation of the basin's circular weir to increase the hydraulic capacity for gravity water flow through the plant.

Aeration Basin - Replace Piping, Nozzles, and Drain Valves

Aeration takes place through a series of aerator nozzles and jets, which spray influent water into the air which spray influent water into the air. This project includes complete replacement of all piping, fittings, nozzles, and the aeration basin drain valve.

Aerated, Settled, and Filter Influent Conduits

Design is substantially in progress. The project is comprised of the following four sub-projects.

Settled Water Conduit - Installation of Access Hatch

Aerated and settled water is conveyed to the various treatment processes through circular and rectangular underground reinforced concrete conduits constructed in 1925. There is limited access to the upper settled water conduit as it is currently configured. Plans are to install an access hatch in conjunction with the filter rehabilitation project. The hatch will facilitate entry

into the settled water conduit by providing a safer and more convenient access point for inspection and rehabilitation 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 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. An internal inspection and structural evaluation of the concrete structures revealed deteriorated areas that require concrete rehabilitation addressed under this project.

Influent Venturis 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 concrete flow meters. These venturis measure the flow rate of water entering the plant.

An internal inspection, structural evaluation, performance evaluation, and plant operational considerations concluded that it is not cost effective to rehabilitate the existing venturi meters to original specifications.

This project consists of encapsulating and abandoning the existing venturi meters in place and installing new vortex meters within the twin existing 60" plant influent conduits upstream of the junction chamber. The flow signals will be incorporated into the existing SCADA system.

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 only, to flow directly to the effluent conduit in the event it becomes necessary to bypass the plant's treatment process in the event 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 which would be an impediment in the event that the bypass would need to be utilized. Plans are for cleaning the lime sludge buildup, addressing required concrete rehabilitative work and installing a flap gate at the entrance of the bypass tunnel to prevent future buildup of the lime sludge.

Chemical Storage, Transfer, and Feed System

Chlorine System Upgrades

Original plans called for the replacement of the existing gaseous chlorine feed equipment. However, in light of increasing safety and security concerns associated with bulk gaseous transport and storage, the entire gaseous chlorine system will be replaced with a new sodium hypochlorite system. As part of the project, a study will be conducted to determine whether the new system should consist of the bulk storage of delivered sodium hypochlorite or on-site generation of the solution.

Ferric System Upgrades

The liquid ferric storage system was installed in 1997. The three 12,000 gallon bulk storage tanks and associated piping are in need of some rehabilitative work. Work will include repairs to the tanks' exterior urethane foam insulation, replacement of exterior pipe and strainer insulation and surface recoating of the tank containment area. Additionally, the transfer and feed system will be further inspected and rehabilitative work performed as needed.

Lime System Upgrades

Due to the expected increase in lime dosage required as a result of the new carbon dioxide chemical feed system presently being installed, the existing feed system will need to be replaced as the current lime feed system does not have the capacity to handle the expected increase while still providing sufficient redundancy. As part of the project, a study will be performed to investigate the benefits and cost of switching from quicklime to hydrated lime. In addition, the existing pipe bends for the lime transfer system will need to be replaced due to the abrasive nature of the chemical.

Filters

Filter Replacement

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. The scope of work includes reconstructing all 18 filters, raising the filter backwash troughs to provide greater filter media depth providing the option for future use of granular activated carbon (GAC), completely removing the existing underground concrete roof slab structures covering the filters with construction of above-ground protective building structures in their place which will furnish full visibility and access to the entire surface areas of the filters. The project also includes replacement of all filter piping, control valves and meters, installation of filter-to-waste piping, and the relocation and replacement of the 48" washwater pipe from inside the congested pipe gallery to an enclosed area to be constructed outside the building. Pipe gallery improvements will also consist of new lighting, HVAC, and a new outside access point that will improve safety conditions and facilitate construction activity of the project. The scope of work also includes the replacement of the existing old control board SCADA system with a new state of the art non-proprietary system.

The project is currently in the first phase of construction, focused primarily within the pipe gallery. The second phase will include the complete reconstruction of all eighteen filter boxes including construction of new concrete gullet walls, installation of new filter underdrains, installation of new backwash troughs, incorporation of an air scour system, new filter media, and erection of the new filter superstructure above the rebuilt filters.

Treatment Process Pilot Model

A bench-scale pilot is operational at the treatment plant. This bench-scale pilot models the treatment train and is being used to evaluate various treatment alternatives to ensure continued compliance with current regulations. Being studied is the potential use of granular activated carbon (GAC) as the filter media at the treatment plant. Piloting work includes determining the impact of prechlorination on its life and whether a pre-oxidant will be required to control manganese in the event that GAC media is utilized.

Inspect Washwater System

The 400,000 gallon washwater tank, which provides backwashing water to the treatment plant's filters, is a circular reinforced concrete underground tank. Two 5,600 GPM horizontal centrifugal pumps are used to fill the washwater tank between filter backwashes. Plans are to evaluate the condition of the pumps, perform a structural evaluation of the tank, and address any deficiencies that are identified.

Building, Support, and Operational Systems

Treatment Plant Building Rehabilitation

The plant will be in need of ongoing improvements. Funds are budgeted for office reconditioning, architectural and structural improvements, rehabilitation of the electrical, plumbing, and mechanical systems, security and fire system upgrades, replacement of the public address system, and site improvements as needed.

PW Lab / Equipment Improvements

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

SCADA / Control System Upgrades

The budget amount in the first year of the plan represents the completion of construction for the upgrades to the existing SCADA system presently underway at the treatment plant. Improvements include new workstations, monitors servers, Programmable Logic Controllers (PLCs), I/O modules, racks and terminations, data communication network, a new operator console and WonderWare control system software upgrade.

Because computer technology is ever-changing and upgrades are routinely needed, funds have been budgeted for the upgrade of the remote PLC system and additional software programming on an as-needed basis. Annual funds are budgeted to anticipate ongoing needs which include future hardware replacements and software upgrades.

Inspect Service Water System

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. Two 1750 GPM horizontal centrifugal pumps pump water to the tank to feed the plant's service and process water system. Plans are to perform a structural evaluation of the tank, and address any deficiencies identified. As part of the scope, a coating application will be applied as needed to the interior and exterior surfaces of the tank, and the current cathodic protection system will be evaluated and replaced if needed.

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 filter backwash and sedimentation operations at the plant. All sludge accumulation that had been previously allowed to accumulate since the plant was originally placed in operation has now been removed from all three lagoons restoring them to their original design intent of providing adequate storage and serving as a buffer that will maintain an acceptable standard of water quality discharged to the Pawtuxet River. Remaining work for sludge removal consists of transport and disposal of the previously stockpiled sludge that was dredged from Lagoon 2, with payment for this work to continue over the subsequent years.

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. The main isolation gate valve, located in a valve vault outside of the reservoir, is difficult to operate and is in need of replacement. Plans are to replace this valve with a new 48" butterfly valve.

Dean Estates Pump Station Upgrades

Construction has begun to rehabilitate the Dean Estates Pump Station. The scope of work includes combining the Garden Hills and Dean Estates pressure zones into a single pressure zone served by one pump station. To accomplish this, a new water main will be installed at the Glen Hills Drive Bridge crossing RI 37. Plans are to rehabilitate only the Dean Estates Pump Station which will allow for the abandonment of the Garden Hills Pump Station. The rehabilitation of the Dean Estates Pump Station includes installation of new variable frequency drive vertical turbine pumps, elimination of the aged hydropneumatic tanks, instrumentation and electrical system upgrades, installation of an emergency generator, and architectural improvements to the pump station building.

Various Pump Stations Improvements

Plans are to periodically inspect all mechanical, electrical, architectural, and structural components of each pump station. Funds have been budgeted for anticipated improvements to remedy deficiencies as identified.

Storage Tanks Inspections / Improvements

Providence Water's distribution storage system consists of 4 underground concrete storage reservoirs and one aboveground tank. Plans are for interior inspections of the structures every ten years to assess their condition. All five tanks are scheduled for inspection during FY2012 and FY2013. Since remedial work cannot be identified at this time, the budget amount shown is for inspection only.

TRANSMISSION SYSTEM

102" Aqueduct Inspection

The 102" aqueduct transmission line, approximately 5.2 miles in length, was constructed in the 1960's and consists of prestressed concrete cylinder pipe (PCCP). In November 1996, a section of this pipeline where it crosses Oaklawn Avenue in Cranston experienced a catastrophic break where the side wall of the pipeline failed. Following the break, a program was developed for inspecting and rehabilitating (as necessary) this critical transmission line on a regular 5-year schedule. The aqueduct has been twice inspected since the with major rehabilitative work being found needed in both cases. In accordance with the inspection schedule, plans are to again perform interior and exterior inspections of the aqueduct in 2011. Since remedial work cannot be quantified at this time, the budget amount shown is for inspection and some minor rehabilitation work only.

78" Aqueduct Inspection

The 78" aqueduct transmission line, approximately 4.4 miles in length, was constructed in the 1960's and consists of prestressed concrete cylinder pipe (PCCP) and two sections of concrete lined tunnel. The 78" pipeline was first inspected in 2008. Major deficiencies were found and significant rehabilitative work became necessary. A program has implemented for inspecting and rehabilitating (as necessary) this transmission line on a regular 5-year schedule. The next inspection of the line is scheduled in the five-year plan. Since remedial work cannot be quantified at this time, the budget amount shown is for inspection only.

90" Effluent Aqueduct Inspection

The 4.5 mile long aqueduct transmission line was constructed in the 1920's. It is comprised of a concrete lined tunnel section between the west and east portals, and reinforced concrete pipe thereafter. Plans are to perform interior and exterior inspections of the aqueduct. Since remedial work cannot be quantified at this time, the budget amount shown is for inspection only.

66", 60", 48" Transmission Mains Inspections

The 66" main, installed in 1926, is an 8500 feet long riveted steel pipeline which transitions to a riveted steel 48" main at Budlong Road in Cranston which then continues easterly an additional 1500 feet to Reservoir Avenue. The 22,140 feet long 60" Neutaconkanut Conduit was installed in 1926. The reinforced concrete steel cylinder pipeline transitions to a 2100 feet long 48" pipeline feeding Neutakoncanut Reservoir. Plans are to perform interior and exterior inspections of the pipelines, rehabilitate the pipe as needed, and provide corrosion protection where applicable. Since remedial work cannot be quantified at this time, the budget amount shown is for inspection only.

16" and Larger Valves Replacements

There are approximately 814 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. Emphasis will also be given to replacing valves that are found to be defective.

DISTRIBUTION SYSTEM

Replace / Upgrade Water Mains

The Providence Water system consists of approximately 885 miles of smaller distribution pipes ranging in size from 6" to 12". Of these, approximately 27% 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. Generally, older unlined cast iron mains will need to receive first priority. Factors such as flow testing, 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 become an area of increasing concentration as our IFR program proceeds.

Replace Distribution Valves

Of the approximately 13,500 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. 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. Emphasis will also be given on replacing valves found to be defective.

Replace Lead Services

As a result of lead testing within the system under the requirements of the Lead and Copper Rule, Providence Water exceeded the lead action level of 15 ppb in more than 10% of customer taps sampled, and was required in September 2006, in accordance with the regulations, to begin the annual replacement of 7% of its 25,000 lead services. If at some future date Providence Water falls below the action level, our plan for the replacement of lead services we will reassessed.

In addition to the scheduled replacement of lead services under our formal program effort, lead services will be replaced in conjunction with the water main replacement program. Services will also be replaced on an ongoing basis under special conditions and where customers are

voluntary replacing their private side lead service. Providence Water will also continue to replace lead services in areas of local and state road resurfacing projects and where lead services are found to be leaking.

Replace Fire Hydrants

There are 6,067 hydrants in the system. Plans are generally to replace all hydrants as they become 75 years old with new breakaway style hydrants. Emphasis will also be given on replacing hydrants that are found defective.

Valve Data Collection Program

The project consists of performing an initial field assessment of the condition and operability of all valve assets, testing and operating each valve, documenting the valve data and condition, mapping with GPS to integrate water system utility information into Providence Water's GIS and asset management system.

Leak Detection

The system is comprised of approximately 885 miles of distribution mains, 114 miles of transmission mains, 814 transmission valves, 13,500 distribution valves, 74,000 services, and 6,067 hydrants. A system-wide leak detection was completed in 2010. The plan is to perform a leak detection survey at approximately 10-year intervals.

SUPPORT SYSTEM FACILITIES

Building and Facilities Rehabilitation

The Forestry Maintenance Garage, the Academy Avenue Administration Building, and the Aqueduct Reservoir Office Buildings are 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.

Facilities Fencing and Roads Rehabilitation

Plans are to replace damaged fencing and rehabilitate deteriorated roads at some of the various distribution reservoirs, pump stations, and facilities. The fencing and road improvements are selected by priority as determined by condition assessment.

Note: Some of these projects are in progress and the cost shown for the project may be a partial costs for the remainder of the project. Therefore, in these instances the budget amount does not reflect the entire cost of the project. The balance that makes up the full project cost was identified and reported prior to fiscal year 2011.

Exhibit 13
Providence Water
15 Year IFR Expenditure Plan
Fiscal Years 2016 through 2030

	Total Amount	Budget 2016-2020	Budget 2021-2025	Budget 2026-2030
RAW WATER SUPPLY				
Large Dam Improvements	**750,000**	250,000	250,000	250,000
Secondary Dam Improvements	**450,000**	150,000	150,000	150,000
Raw Water Booster Pump Station Improvements	**200,000**	200,000		
Gainer Dam Gatehouse Improvements	**1,000,000**	1,000,000		
Raw Water Conduit Improvements	**150,000**		150,000	
Watershed Fence and Road Rehabilitation	**750,000**	250,000	250,000	250,000
Raw Water Supply Total	**3,300,000**	**1,850,000**	**800,000**	**650,000**
TREATMENT PLANT				
Central Control System (SCADA) Upgrades	**600,000**	200,000	200,000	200,000
Conduits and Structures Inspection/Rehabilitation	**280,000**	10,000	260,000	10,000
Sedimentation Basins Rehabilitation	**30,000,000**	30,000,000		
Chemical Storage/Transfer/Feed Systems Improvements	**700,000**	150,000	400,000	150,000
Filter Improvements	**200,000**		200,000	
Treatment Plant Laboratory Improvements	**750,000**	250,000	250,000	250,000
Process Meter Replacements	**225,000**	75,000	75,000	75,000
Lagoon System Improvements	**1,200,000**	1,000,000	100,000	100,000
Treatment Plant Building Improvements	**2,900,000**	2,400,000	250,000	250,000
Treatment Plant Total	**36,855,000**	**34,085,000**	**1,735,000**	**1,035,000**
PUMPING AND STORAGE				
Pump Station Improvements	**425,000**	125,000	150,000	150,000
Bath Street Pump Station Improvements	**2,000,000**		2,000,000	
Neutaconkanut Pump Station Improvements	**2,000,000**		2,000,000	
Greenville Ave Pump Station Improvements	**1,000,000**	1,000,000		
Cranston Commons Pump Station Improvements	**1,500,000**	1,500,000		
Fruit Hill Pump Station Improvements	**1,000,000**	1,000,000		
Storage Tank Inspections / Improvements	**2,000,000**		2,000,000	
Pumping and Storage Total	**9,925,000**	**3,625,000**	**6,150,000**	**150,000**

Exhibit 13
Providence Water
15 Year IFR Expenditure Plan
Fiscal Years 2016 through 2030

	Total Amount	Budget 2016-2020	Budget 2021-2025	Budget 2026-2030
TRANSMISSION SYSTEM				
78" and 102" Aqueducts Inspection / Rehabilitation	**5,400,000**	1,600,000	1,800,000	2,000,000
90" Aqueduct Inspection / Rehabilitation	**6,000,000**		6,000,000	
66", 60", 48" Transmission Main Inspections	**100,000**	50,000		50,000
16" and Larger Valve Replacements	**2,100,000**	1,000,000	500,000	600,000
Transmission System Total	**13,600,000**	**2,650,000**	**8,300,000**	**2,650,000**
DISTRIBUTION SYSTEM				
Distribution Main Upgrades	**160,000,000**	25,000,000	60,000,000	75,000,000
Distribution Valve Replacements	**1,875,000**	500,000	625,000	750,000
Lead Service Replacements	**40,900,000**	40,900,000		
Hydrant Replacements	**3,750,000**	1,000,000	1,250,000	1,500,000
Leak Detection	**100,000**		100,000	
Distribution System Total	**206,625,000**	**67,400,000**	**61,975,000**	**77,250,000**
SUPPORT SYSTEMS AND FACILITIES				
Building and Facilities Rehabilitation	**3,000,000**	1,000,000	1,000,000	1,000,000
Records Management (GIS) Upgrades	**1,500,000**	500,000	500,000	500,000
Facility Fence and Road Rehabilitation	**750,000**	250,000	250,000	250,000
Underground Fuel Storage Tank Replacements	**200,000**	200,000		
Support Systems and Facilities Total	**5,450,000**	**1,950,000**	**1,750,000**	**1,750,000**
TOTAL	**275,755,000**	**111,560,000**	**80,710,000**	**83,485,000**

EXHIBIT 14 – 15-Year IFR Project Overview – FY 2016 through 2030

RAW WATER SUPPLY

Large Dam Improvements

Plans are to inspect all 6 dams and structures and to conduct remedial work as required to extend their useful lives. Amounts are budgeted for ongoing needed improvements.

Secondary Dam 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. Plans are to inspect all secondary dams and structures and to conduct remedial work as required to extend their useful lives. Amounts are budgeted for needed improvements for the continual upkeep of all 6 dams and appurtenant structures.

Raw Water Booster Pump Station Improvements

Various architectural improvements are needed at the Raw Water Booster Pump Station. Work includes replacement of the garage doors, windows and roof replacement, and brick and tile restoration.

Gainer Dam Gatehouse Improvements

The gatehouse dates back to its original construction in the 1920's and is in need of architectural rehabilitation along with replacement of the two existing cranes.

Raw Water Conduit Improvements

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 shown for this project is for inspection only.

Watershed Fence and Road 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. Amounts are budgeted to perform ongoing rehabilitative work as needed.

TREATMENT PLANT

Central Control System (SCADA) Upgrades

Given that the nature of computer technology is ever changing, funds have been budgeted 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 SCADA system.

Conduits and Structures Inspection / Rehabilitation

This project consists of internal inspections 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, and washwater tank every ten years. The project also consists of an internal inspection and structural analysis of the service water tank every five years. A budget amount has been included to perform these inspections and to address minor rehabilitative work only.

Sedimentation Basins Rehabilitation

The sedimentation basins at the plant consist of two large open water surface basins that were part of the plant's original construction back in the 1920s. The massive area of concrete walls and slabs making up the basin have deteriorated over time and initially our IFR plans were to rehabilitate and renew them back to nearly original condition. In light of the outmoded nature of this sedimentation process by today's standards, we have reconsidered this approach. Providence Water is considering a new modern-design settling system to be installed in their place. Such an installation would consist of automatic mechanized removal of sludge on a continuous basis, eliminating sludge buildup and cleaning and handling requirements. This project is at this point conceptual in nature only.

Chemical Storage/Transfer/Feed Systems Improvements

Five chemicals are added in the treatment process at different locations at the treatment plant. Amounts are budgeted for needed improvements to the feed systems during the 15-year plan period.

Due to the corrosive nature of the ferric sulfate, it is anticipated that various components of the storage, transfer, and feed systems will need to be rehabilitated during the 15-year period.

The lime feeders will be replaced during the first five years of the plan. Due to the abrasive nature of the dry chemical, sections or all of the transfer piping will need to be replaced at regular intervals.

The chlorine gas system will be replaced with a liquid chlorine system during the first five years of the plan. The new system will be inspected during the 15-year plan period and remedial work will be performed as needed.

Fluoride is added as a liquid in the clearwell just prior to water leaving the treatment plant. The fluoride system was installed back in 2005. Due to the corrosive nature of the chemical, it is anticipated that various components of the storage, transfer and feed systems will need to be rehabilitated during the 15-year period.

A carbon dioxide feed system is currently under construction under the Capital Program. The new system will be inspected during the 15-year plan period and remedial work will be performed as needed.

Filter Improvements

All eighteen filters, including all valves and piping, are scheduled to be rehabilitated during the first five years of the plan. Amounts are budgeted for needed improvements for the continual upkeep of the entire filtration system during the 15-year period.

Treatment Plant Laboratory Improvements

The plan is to replace laboratory equipment and provide architectural upgrades as they become necessary. The budget amounts shown in the plan are for anticipated needs.

Process Meter Replacements

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, PW is planning to replace fluoride residual meters, chlorine residual meters, pH meters, turbidimeters, and a total organic carbon meter.

Lagoon System Improvements

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 the transport and disposal of the previously stockpiled sludge that was dredged from Lagoon 2. Payment for this work will end in the first year of the 15-year plan in accordance with contractual requirements.

Treatment Plant Building Improvements

Various rehabilitative work has been conducted at the facility. The building requires ongoing structural, architectural, and mechanical rehabilitation and upgrades.

PUMPING AND STORAGE

Pump Station Improvements

Plans are to periodically inspect all mechanical, electrical, architectural, and structural components of each pump station. Funds have been budgeted for anticipated improvements, and to remedy deficiencies as they are identified through inspections.

Bath Street Pump Station Improvements

It is anticipated that various mechanical, electrical, architectural, and structural improvements will be needed at this pump station as they are identified through inspections. Major upgrades to the station will be required in the second five-year period of the fifteen-year plan.

Neutaconkanut Pump Station Improvements

It is anticipated that various mechanical, electrical, architectural, and structural improvements will be needed at this pump station as they are identified through inspections. Major upgrades to the station will be required in the second five-year period of the fifteen-year plan.

Greenville Avenue Pump Station Improvements

It is anticipated that various mechanical, electrical, architectural, and structural improvements will be needed at this pump station as they are identified through inspections. Major upgrades to the station will be required in the first five-year period of the fifteen-year plan.

Cranston Commons Pump Station Improvements

Anticipated in the first 5 years of the 15-year plan is the replacement of the below grade pump station with an above ground pre-engineered packaged unit with its own emergency back-up generator.

Fruit Hill Pump Station Improvements

It is anticipated that pumps will need to be replaced in the first five years of the 15 year plan along with upgrades to the various mechanical and electrical systems, as well as architectural and structural improvements.

Storage Tanks Inspections / Improvements

Plans are to alternately perform a visual inspection and an extensive inspection every ten years for the 5 tanks in the system. Visual inspections will be performed by divers without dewatering the structure. More extensive inspections will be conducted in a fully dewatered structure. Since remedial work cannot be quantified at this time, the budget amounts shown in the plan are for inspection only.

TRANSMISSION SYSTEM

78" and 102" Aqueducts Inspection / Rehabilitation

The 78" and 102" aqueduct 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. The 78" and the 102" aqueducts have both undergone significant rehabilitation as extensive corrosive damage has been discovered in previous inspections. In accordance with the inspection and rehabilitation program developed, both the 78" and 102" lines will continue to be inspected and rehabilitated, as necessary, every five years.

90" Aqueduct Inspection / Rehabilitation

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 previously inspected and rehabilitated as corrosive damage was discovered during the inspection. During the last inspection of the tunnel section, 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 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.

66", 60", 48" Transmission Mains Inspection

The 66" main, installed in 1926, is a riveted steel pipeline and extends for 8500 feet and then transitions into a riveted steel 48" main at Budlong Road and continues easterly for an additional 1500 feet to Reservoir Avenue. The 60" reinforced concrete steel cylinder pipeline (Neutaconkanut Conduit), installed in 1926, extends for 22,140 feet and feeds into a 48" reinforced concrete steel cylinder pipeline for an additional 2100 feet to the Neutakoncanut Reservoir. 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 1955 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. Emphasis will also be given on replacing valves that are found defective.

DISTRIBUTION SYSTEM

Distribution Main Upgrades

The system consists of approximately 885 miles of smaller size distribution pipes ranging in size from 6" to 12". Of these mains, approximately 27 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 in 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.

Distribution Valve Replacements

Of the 13,500 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.

Lead Service Replacements

The plan is to continue to replace lead services in accordance with the requirements of the Lead and Copper Rule. If at some future date Providence Water falls below the regulatory lead action level, we will reassess our plan for the replacement of lead services.

Additionally, lead services will be replaced in conjunction with the water main replacement program. 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. Providence Water will also continue to replace lead services in areas of local and state road resurfacing projects and where lead services are found to be leaking.

Hydrant Replacements

The objective of the hydrant replacement program will be to maintain ages of hydrants in the system no older than 75 years. Emphasis will also be given on replacing hydrants that are found to be defective.

Leak Detection

The system is comprised of 885 miles of distribution mains, 114 miles of transmission mains, 814 transmission valves, 13,500 distribution valves, 74,000 services, and 6,067 hydrants. The plan is to perform a leak detection survey of the system every ten years.

SUPPORT SYSTEM FACILITIES

Building and Facilities Rehabilitation

The Forestry Maintenance Garage, Academy Avenue Administration Building, Aqueduct Reservoir Office, and the Watershed Storage Building 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.

Records Management (GIS) 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 both the asset management system and GIS. Upgrades will consist of hardware replacements, software upgrades, and new hardware and software additions to the system.

Facility Fence and Roads Rehabilitation

It is anticipated in the 15-year plan that various facility access roads will need to be resurfaced. Fences will also be in need of replacement or rehabilitation.

Underground Fuel Storage Tank Replacements

Planned work is scheduled for the first five years of the 15-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

Section IV – Revenue Requirements

Overview of Revenue Requirements

Exhibit 3 – Sources and Uses of Funds – FY 2011 through 2030 – 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 $16 million per year. Additional funding and borrowing will be required to balance the projected expenditures.

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. Over the years, Providence Water has requested and the PUC has approved several increases to the funding level consistent with our plan and accomplishments.

Providence Water has a short term revolving line of credit with Century Bank that provides Providence Water access to funds in case of an emergency or cash flow fluctuations. Providence Water does plan to issue bonds for some of our projects in our IFR plan. The plan is also balanced by projecting a number of additional increases in the funding level authorized by the PUC. Please see EXHIBIT-4. Over the 20 year period, current funding is $320 million, current available bond proceeds are $8.3 million and available funds from prior years are $15.1 million. Additional bond proceeds of $45.5 million and additional rate revenue of $115.5 million will be needed to balance the plan.

Uses of funds

Providence Water has cash funded projects totaling $385,345,000 over the 20 year period. This amount includes capitalized labor and benefits authorized by the Public Utilities Commission to be reimbursed to Providence Water's Operating Fund from the IFR Fund. Debt service is included as a use of funds in this plan. Existing debt service totals $62,809,000, and additional debt service totals $50,502,000.

To recap, total cash funded construction projects are $385.3 million, current debt service is approximately $62.8 million and additional debt service is projected at $50.5 million for total uses of funds of $498.7 million. Total sources of funds are projected at $504.4 million, resulting in a small $5.7 million projected surplus over the 20 year period. 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, and the projected funding of the plan, is based on the best information available at this time.

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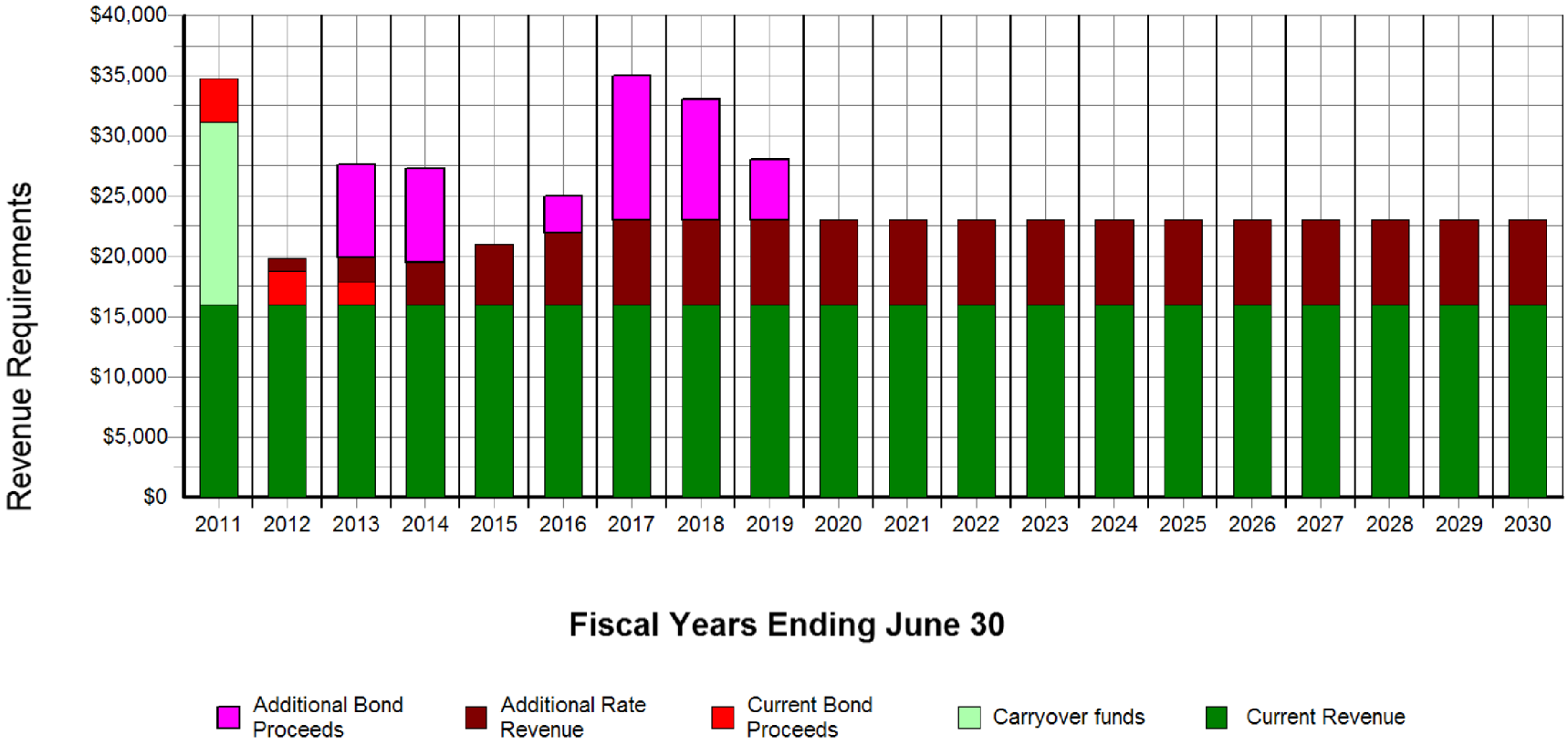
Exhibit 3

Providence Water
Sources and Uses of Funds
IFR Funding & Expenditure Projections ($000's)
Fiscal Years 2011 through 2030

	2011-2015	2016-2020	2021-2025	2026-2030	2011-2030
	Phase 1	Phase 2	Phase 3	Phase 4	Total
Sources of Funding:					
Current Authorized Funding	$80,000	$80,000	$80,000	$80,000	$320,000
Current Bond Proceeds	8,300	0	$0	$0	8,300
Funds Available from Prior Years	15,123	0	$0	$0	15,123
Additional Rate Revenue	11,500	34,000	$35,000	$35,000	115,500
Additional Bond Proceeds	15,500	30,000	$0	$0	45,500
Total Sources of Funds	130,423	144,000	115,000	115,000	504,423
Uses of Funding:					
Cash Funded Construction Projects	$109,590	$111,560	$80,710	$83,485	$385,345
Existing Debt Service	18,742	14,689	14,689	14,689	62,809
Additional Debt Service	1,775	13,948	17,390	17,390	50,502
Total Uses of Funds	130,107	140,197	112,789	115,564	498,656
IFR Program Surplus/(Deficit)	$317	$3,804	$2,211	-$564	$5,767

Exhibit 4
Providence Water
IFR Funding Projections $(000's)
Fiscal Years 2011 through 2030



Appendix

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

Infrastructure / Capital Program Report 1996 - 2010 (September 2010)

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".
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1.)

§ 46-15.6-2 Legislative findings, intent, and objectives. - (a) 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.

(b) That the objectives of this chapter are:

(1) 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

(2) That the plans and their execution achieve and insure that the investment of the public in such facilities is not eroded.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1; P.L. 2007, ch. 340, § 53.)

§ 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1.)

§ 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1.)

§ 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, water resources board, 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1; P.L. 1995, ch. 103, § 1; P.L. 1997, ch. 37, § 1; P.L. 1998, ch. 340, § 1; P.L. 2009, ch. 288, § 9; P.L. 2009, ch. 341, § 9.)

§ 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. 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1; P.L. 2009, ch. 288, § 9; P.L. 2009, ch. 341, § 9.)

§ 46-15.6-7 Rules governing content of programs, components, review, evaluation, funding, and implementation. - The department with the concurrence of the water resource board, 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 water resource board, 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1; P.L. 1997, ch. 37, § 1; P.L. 2009, ch. 288, § 9; P.L. 2009, ch. 341, § 9.)

§ 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1.)

§ 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.
History of Section.
(P.L. 1993, ch. 312, § 1; P.L. 1993, ch. 438, § 1.)

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.

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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

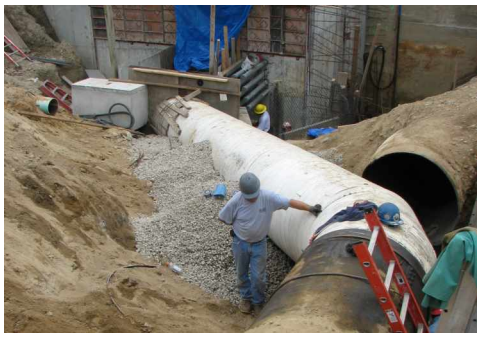
EQUIPMENT	YEARS
Source of supply plant	
Structures and improvements	35-40
Collecting/impounding reservoirs	50-75
Intake structures	35-45
Wells and springs	25-35
Galleries and tunnels	25-50
Supply mains	50-75
Pumping plant	
Structures	35-40
Pumping equipment	10-15
Other pumping plant	20
Water treatment 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

Providence Water

Infrastructure/Capital Program Report
1996 – 2010







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SEPTEMBER 2010

Providence Water

PROVIDENCE WATER SUPPLY BOARD

INFRASTRUCTURE/CAPITAL PROGRAM REPORT
For July 1, 1995 Through June 30, 2010

Prepared In-House by the
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SEPTEMBER 2010

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INTRODUCTION

Providence Water is a full service utility supplying drinking water and fire protection to 60 percent of the State's population in 14 communities. 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.

Presently, Providence Water has an active Infrastructure Replacement Program in place which is intended to stave off deterioration and obsolescence. Providence Water began this program in 1990. The program was expanded in 1996 with the further availability of Infrastructure Replacement Funds.

Reliable drinking water has always been the basis of economic development and the seed for communal life throughout the world. Initially, Rhode Island's population, centering around Providence, received its water from wells. As development became more dense, industrialization and urbanization generated waste, threatening the groundwater upon which the population relied. By the mid-1860's, Providence created its first formal water utility which impounded water in an open-surface reservoir and distributed it through an ever-growing piping system within the communities in the central portion of the State. Continued pressure by urbanization and industrialization led to more intense pollution of the rivers and the underground basin and it became apparent that a new source of water needed to be found. By 1925, the Scituate Reservoir complex and a modern water treatment plant had been constructed, which is the source of water supply to approximately 600,000 people today.

In 1993, the state legislature was asked to adopt a law which would set aside portions of water revenue for a long-term planned infrastructure replacement program. The R.I. Public Utilities Commission, who recognized the same need as Providence Water did, provided funding incrementally for this program. Since 1993, Providence Water allocates a portion of its revenue to ensure the reliability of the system into the next century.

Providence Water engineers and accountants have implemented a "Funded Depreciation Program" under the infrastructure replacement legislation which is administered as a restricted fund under PUC orders. This program is based on practical economic lives of various facility groups, obsolescence, severity of deterioration, and inflationary impacts on materials and construction. Providence Water is still catching up on the decades of deterioration and plans to replace facilities uniformly throughout the system once the initial backlog has been overcome.

The initial Infrastructure Replacement Plan was submitted in February 1996 with the second plan submitted March 2001 in accordance with the requirements of the Comprehensive Clean Water Infrastructure Act of 1993. The plan is amended as needed to meet new challenges as they manifest themselves. An infrastructure replacement plan is a living document which must be monitored and amended periodically to meet the initial objective of the program under which it was established.

Since 1990, Providence Water has reinvested nearly $220 million into the utility's infrastructure replacements and capital improvements. None of this could have happened had this program not been proposed by us initially, had the legislature and the Commission not supported the wisdom of the need, and had our engineers and workforce not dedicated themselves to this mission as we did.

PROVIDENCE WATER
Source of Funds *

	CIP & Infrastructure Replacement Funds	Meter AMR Fund	Water Operating Fund	$12 Million RICWFA Bond	RI Water Resources Board Bond	RICWFA Bonds '99,'01,'02,'03,'08	Total IFR / CIP Expenditures
FY 1997	$6,218,945	$0	$805,992	$3,241,456	$2,506,182	$0	$12,772,575
FY 1998	$9,238,174	$0	$911,427	$0	$324,021	$0	$10,473,622
FY 1999	$14,067,247	$0	$1,077,270	$0	$0	$0	$15,144,517
FY 2000 **	$4,453,264	$615,379	$1,059,091	$0	$0	$4,842,508	$10,970,242
FY 2001	$6,989,458	$948,305	$2,044,602	$0	$0	$2,589,224	$12,571,589
FY 2002	$9,297,372	$795,496	$1,614,338	$0	$0	$2,418,731	$14,125,937
FY 2003	$8,435,588	$1,217,768	$1,171,251	$0	$0	$2,580,661	$13,405,268
FY 2004	$8,122,198	$750,247	$1,211,479	$0	$0	$1,502,197	$11,586,121
FY 2005	$9,530,028	$487,538	$992,721	$0	$0	$23,348	$11,033,635
FY 2006	$13,520,361	$764,454	$987,443	$0	$0	$0	$15,272,258
FY 2007	$9,569,062	$772,658	$968,454	$0	$0	$0	$11,310,174
FY 2008	$18,229,137	$88,055	$515,334	$0	$0	$0	$18,832,526
FY 2009***	($4,006,988)	$55,091	$521,131	$0	$0	$24,904,502	$21,473,736
FY 2010	$20,007,683	$0	$282,961	$0	$0	$6,955,335	$27,245,978

* Provided by Providence Water Finance Department

** $3,199,639 of RICWFA Bond proceeds reimbursed CIP/IFR Funds for expenses incurred in FY 99

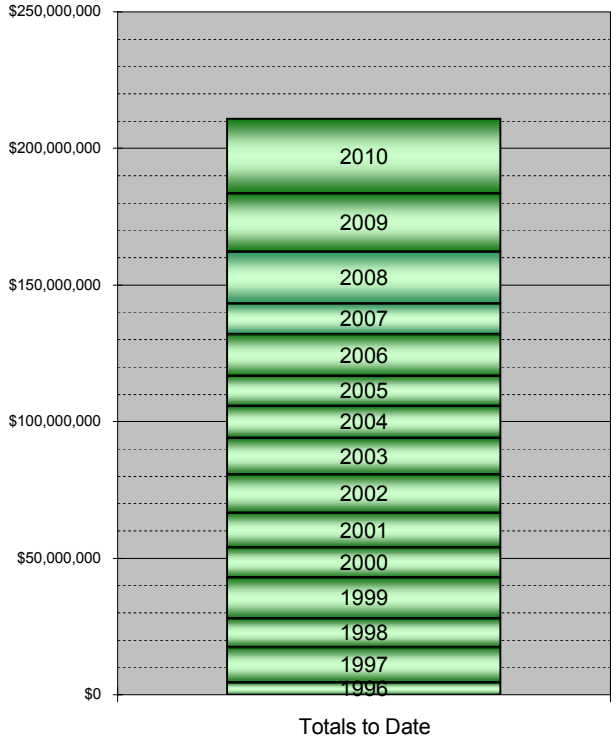
*** $12,435,056.81 of RICWFA Bond proceeds reimbursed CIP/IFR Funds for expenses incurred in FY 08

** * During January - June 2010 IFR Fund reimbursed $456,009.81 to Operating Fund per the RI PUC order.

PROVIDENCE WATER

Summary Of Expenditures

Fiscal Years 1996 To 2010

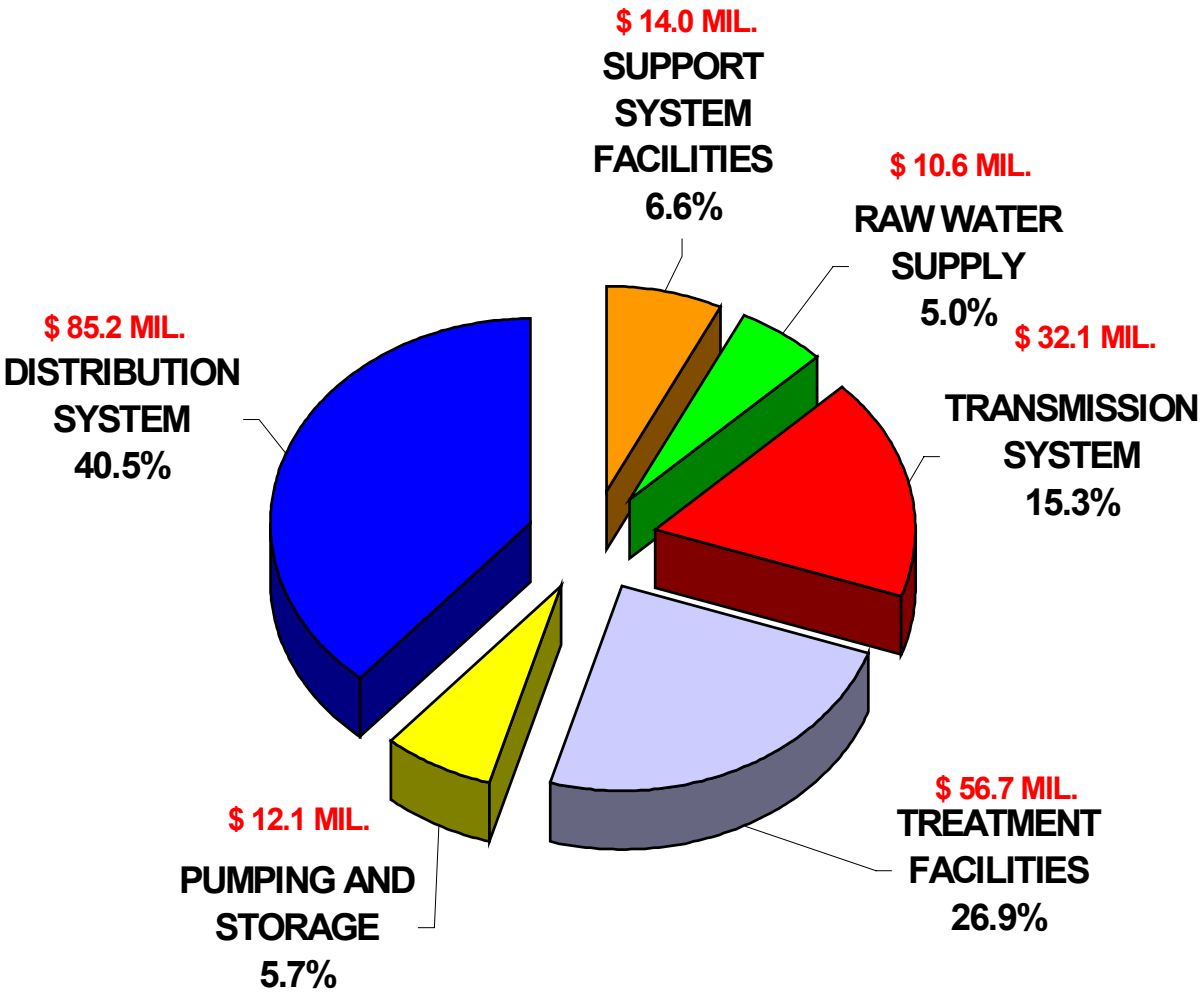


	Expenditures		
Fiscal Year	**IFR**	**CIP**	**TOTAL**
1996	$4,380,022	$188,374	**$4,568,396**
1997	$12,612,265	$160,310	**$12,772,575**
1998	$10,248,978	$224,644	**$10,473,622**
1999	$14,864,327	$280,190	**$15,144,517**
2000	$10,175,318	$794,924	**$10,970,242**
2001	$11,551,726	$1,019,863	**$12,571,589**
2002	$10,915,284	$3,210,653	**$14,125,937**
2003	$10,054,569	$3,350,699	**$13,405,268**
2004	$7,864,982	$3,721,139	**$11,586,121**
2005	$9,856,233	$1,177,402	**$11,033,635**
2006	$13,996,118	$1,276,139	**$15,272,258**
2007	$9,746,919	$1,563,255	**$11,310,174**
2008	$16,854,654	$1,977,873	**$18,832,526**
2009	$20,622,218	$851,518	**$21,473,736**
2010	$26,790,595	$455,383	**$27,245,978**
Totals to Date	**$190,534,210**	**$20,252,365**	**$210,786,575**

PROVIDENCE WATER

IFR / CIP Expenditures

Fiscal Years 1996 Through 2010*



Total Investment Into System $210.6 MIL.

*Expenditures Through June 30, 2010

IFR PROJECT STATUS REPORT

PROJECT NARRATIVES

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

Gainer Dam Stonewall Rehabilitation

Construction has been completed to reconstruct 5800 feet of the dry masonry type stonewall located on the north and south sides of RI Route 12 along the length of Gainer Dam.

60" Influent Conduits - Corrosion Protection

Corrosion on 60 inch main prior to rehabilitation

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.

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

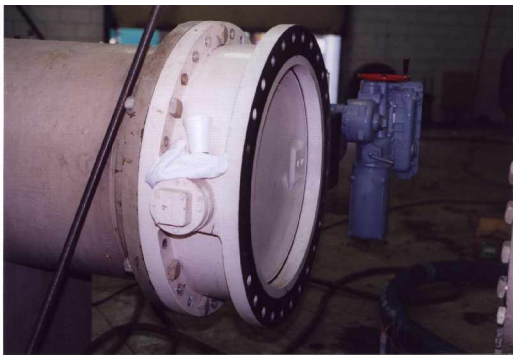
Installation of Level Measuring Equipment

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)

Construction is complete at Westconnaug Reservoir Dam consisting 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.

Installation of new sluice gate

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 has been completed for needed improvements to the heating system.

Raw Water Booster Pump Station Electrical Upgrades

The project to replace the motor control center at the RWBPS is complete. The motor control center dated back to the original construction of the pump station in 1966 and needed to be replaced as parts have become obsolete. The project consisted 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.

Installation of new motor control center

Large Dam Improvements

Work under this project is to address minor deficiencies as identified through continuing inspections. At Westconnaug Reservoir a new security gate has been installed at the main entrance of the dam. At Barden Reservoir the downstream slope of the dam was regraded and reseeded, and the riprap along the spillway channel was reconstructed. Work also included installation of a safety handrail along the west bank of the spillway.

Evaluation of Secondary Dams

A study to assess the risks to, and the need for improvements to the smaller secondary dams within the watershed has been completed. These secondary dams include the Coomer Reservoir Dam, the Kimball Reservoir Dam, and the Peeptoad (Harrisdale) Pond Dam. The study included a visual inspection, geotechnical evaluation, and hydraulic and hydrologic analyses. A scope of work is being identified from this study for future rehabilitation work.

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.

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.

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

Two of four new lime feeders installed at treatment plant

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

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 liquid ferric sulfate bulk storage tanks

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.

New check valve installation

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.

Painting of 48" Washwater Main

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 blowers

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.

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.

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.

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

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.

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.

New treatment plant emergency generator

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

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.

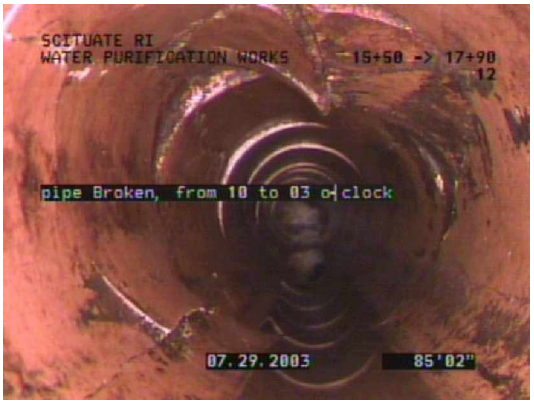
New Pumps following replacement

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



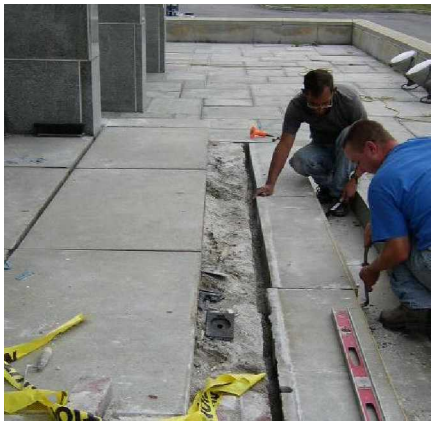
Screen shot of pipe inspection – Broken Pipe

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

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. The new lime transfer system was placed in operation in January 2005.

Lowering section of new blower building into place

Footings for new access stairs to silos

New fluoride tanks in place

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.

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 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.

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 is complete for the upgrades to the various heating system components throughout the treatment plant.

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 and the replacement of the three access hatches for the tank has been completed. The replacement of the main 36" washwater valve has been replaced and the project is now complete.

Service Water Tank Inspection / Improvements

The service water tank located at the treatment plant has been inspected and was found to be in very good structural condition. The sacrificial zinc anodes were replaced as recommended in the inspection report.

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 replaces the ferric injection point from pre-aeration (where it takes approximately 40 seconds to mix) to a new post-aeration injection point which provides near instantaneous mixing. The project is complete and the new pump flash mixer system is operational.

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 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.

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 telemetry 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.

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.

A new water level transducer was installed at the Lawton Hill reservoir to replace the old transmitter. The old transmitter was sometimes affected by pressure fluctuations when the reservoir was filling which interfered with the proper control of pumping operations. The new transmitter will more reliably measure the water level in the reservoir.

A new water level transducer, transmitter, and radio telemetry equipment were installed at the outlet structure of Sludge Lagoon #2 to monitor the water discharge over the existing stop logs to the Pawtuxet River. Radio receiver equipment was installed at the Water Treatment plant and tied into the Master PLC (programmable logic controller) to receive the transmitted data. A new report was developed to log the flow data from the new transmitter. The new transmitter now allows the continuous monitoring of the discharge rate from the sludge lagoons.

A new PLC was installed at the new emergency pumping facility recently constructed at structure "D" in our transmission system. The new PLC will transmit pumping and flow data to the master PLC at the water treatment plant. Plans are to install distribution system monitoring equipment at structure '"D" to monitor pH, chlorine residual, conductivity, and fluoride.

Construction has been completed to upgrade the Autocon RTU at the Greenville Avenue pumping station to an Allen-Bradley PLC. These improvements are being conducted in conjunction with upgrades to the pumping station which consisted of installing variable frequency drive (VFD) controls on the three domestic pumps to stabilize water pressures within its service area. A new remote pressure monitoring station is being installed in the distribution system of the pumping zone of the Greenville Ave. pumping station to provide system operating pressure data to the station and the central control system at the treatment plant.

Thirty-Four (34) gage and differential pressure transmitters have been replaced at all of the 24 remote locations. All of the 24 remote telemetry units (RTU's) have been

replaced with programmable logic controllers (PLC's) for increased security, more efficient data transmission, and lower operating and maintenance costs. Additionally, software and hardware modifications to the master PLC at the treatment plant to incorporate the modifications from the remote pump station PLC's are completed. A redundant master PLC was installed for added system reliability. The existing chart recorder and level transmitter have been replaced at the Gainer Dam gatehouse to ensure continued accuracy and reliability.

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

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

Installation of new access manhole into 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

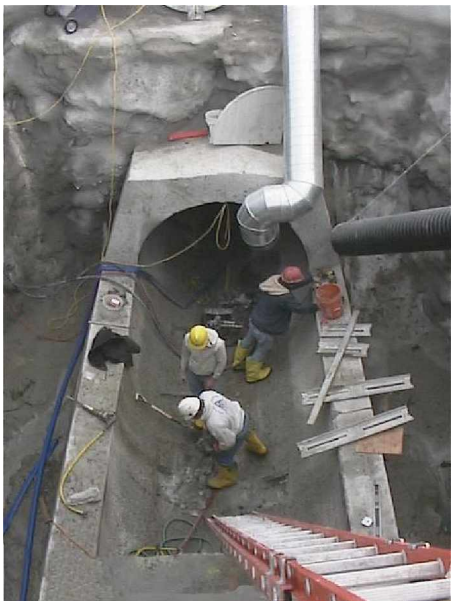
Extensive concrete corrosion damage was discovered in the treatment plant's 90-inch effluent conduit during the rehabilitation of the plant's effluent venturi meters. Subsequently, a video inspection in November 1999 revealed further extensive concrete corrosion damage continuing along the 90" aqueduct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



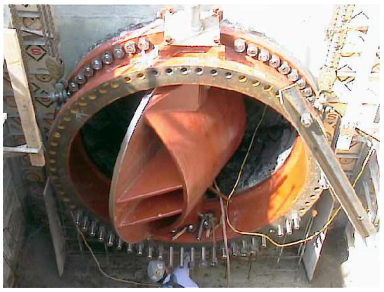
Access into 90" aqueduct at new valve location

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.

102" Aqueduct - Inspection

A contract was 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 had not been previously done. These seven pipe sections were 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. Several pipe sections were excavated and inspected with several minor deficiencies being corrected.
Also as part of this project, a fiber optic data acquisition system and acoustic monitoring sensor line was installed in the pipeline. This system provides real-time monitoring on a continuous 24-hour per-day basis to acoustically detect and analyze reinforcing wire breaks as they occur. Since this fiber optic sensor line will continually monitor the sounds being transmitted through the pipeline to detect the acoustic events associated with the failure and break of prestressed wires, it is expected that there will not be the need to dewater and perform internal inspections of the pipeline as frequently as originally expected.

The pipeline was placed back in service prior to the start of the high demand season. During the fall of 2006, the remaining portion of the pipeline from the 102-inch butterfly valve to Structure E was inspected utilizing the same electromagnetic imaging performed on the first pipeline section. The electromagnetic imaging found no major problems, detecting only 19 pipe sections with a minor number of possible wire breaks. An interior structural walkthrough that included hammer sounding of the entire pipe section at various circumference positions also indicated no major areas of concern in this pipeline section. The acoustic monitoring sensor line was also extended from the 102-inch butterfly valve to Structure E, which will enable the entire 102-inch pipeline to be continually monitored.

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

The first time ever inspection of the 78 inch aqueduct has been completed and pipe sections found severely deteriorated have been repaired. Providence Water is in the process of reviewing the final report of the inspection findings and pipeline condition and risk assessments for both the 78" and 102" aqueducts.

In preparation of the inspection of the 78" pipeline, four existing access manholes and covers that had previously been buried well below grade were raised to the surface. In addition, to assist in the dewatering of the pipeline and to provide additional access, four additional manholes were installed along the pipeline.

The inspection began in the fall of 2007 utilizing the same technique that was used on the 102" inspection involving electromagnetic imaging through the interior of the pipeline which detects the presence of broken prestressed wires within the pipe, and a visual and structural inspection using acoustic hammer soundings. The inspection was performed in two phases.

During the first phase, the 78" pipeline was inspected from the treatment plant up to the newly installed 78" butterfly valve at Kent County's Clinton Avenue connection. Based on the results from both the electromagnetic testing and acoustic soundings, it was determined that four pipe sections warranted further investigation. These four pipe sections were excavated and found to have significant damage consisting of numerous wire breaks and significant hollow areas. Three of the four pipe sections were repaired utilizing a 3-sided reinforced concrete encasement structure. Due to the depth of cover (approximately 25'), the fourth pipe section was repaired utilizing post-tensioned tendons around the exterior of the pipe encased in reinforced concrete.

The second phase of the inspection was performed from the 78" butterfly valve to Structure D. Once again utilizing electromagnetic imaging and acoustic hammer soundings, five pipe sections of concern were identified. Three pipe sections were partially excavated and inspected from which it was determined that no repair work was needed. The two remaining pipe sections, located beneath a roadway, were excavated and found to have significant damage consisting of numerous wire breaks and significant hollow areas. Due to the extent of the damage to these pipe sections,

the pipe sections were repaired utilizing post-tensioned tendons around the exterior of the pipe encased in reinforced concrete. One additional pipe section in this area was also excavated and although no wire breaks or significant hollow areas were found, areas of exposed reinforcing wires were observed. To further protect this pipe section it was encased in reinforced concrete. In addition, an access manhole was installed on this pipe section in anticipation of further repair work being required in this area in the future. Note that this project is combined with the inspection and rehabilitation of the 102" Aqueduct, the 78" tunnel section, and the tunnel shaft Structures "D" and "E"

Improvements to Structure "D" and "E"

A contract was awarded for inspection/design services for Structures "D" and "E". The inspection of these structures was completed this past fall. Note that this project is combined with the inspection and rehabilitation of the 102" and 78" Aqueducts.

66" Transmission Main Inspection

The 66" main, approximately 8500 feet in length, installed in 1926, is a riveted steel pipeline. The inspection of this pipeline consisted of an over the line sight survey, soil resistivity testing, soil chemistry analyses, leak detection, and an internal inspection and select external excavations. The 66" transmission main inspection has been completed and the line was found to be in good structural condition with no major remedial work required. Cleaning and recoating the exposed exterior surfaces of the transmission main and valves located in one air release, one blowoff, and two access vaults were completed as recommended by the inspection report.

60" Transmission Main Inspection

The 60" main (Neutaconkanut Conduit), installed in 1926, is a 21,000 feet-long 60-inch reinforced concrete steel cylinder pipeline. The exterior inspection of the 60" transmission main has been completed consisting of an over the line sight survey, soil resistivity testing, soil chemistry analyses, and select excavations to inspect the main. Exterior and interior inspections were conducted on the transmission main that indicated that the conduit is in very good physical condition. A final condition assessment report was submitted with the results indicating that no follow-up work is needed on the concrete pipe.

P**umping and Storage**

Delivery of new generator enclosure

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.

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.

Aqueduct Reservoir Waterproofing

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.

Ridge Road Reservoir - Inspection

The Ridge Road tank, constructed in 1989, is an above ground prestressed concrete tank with a storage capacity of 3.5 MG which provides operational and fire flow storage for the Extra-High Service area of North Providence. Inspection of the Ridge Road Reservoir tank has been completed. No corrective action was identified for the interior or exterior of the tank at this time. The tank will be inspected again in about five years.

Aqueduct Pump Station Rehabilitation

Construction for rehabilitation of the pump station has been completed. 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 included a modular addition to the existing building that houses 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.

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. Work has been completed for concrete rehabilitation of the interior of the tank, installation of a new electric hoist in the gatehouse, rehabilitation of the existing stop shutters, and the installation of a 60" butterfly valve to functionally replace a 75-year-old gate valve. Also completed were the replacement of a sluice gate inside the reservoir and the installation of a 48" feed line adjacent to the tank to allow for improved water circulation inside the tank.

A leak was discovered on the new 48" circulation line in the vicinity of the reservoir when the reservoir was placed back in service in the spring and the line has been subsequently shut down. Excavation of the reservoir slope has been completed and the leak was located in the casting in the reservoir wall where the new pipe enters the reservoir. Repairs have been completed.

<u>Distribution System</u>

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.

Replace Water Meters

In accordance with the Report and Order of Docket Number 3832, the funding for future water meter replacements is to be from a restricted Meter Replacement Account rather than from the IFR Account. All meter replacements, and all Automatic Meter Reading (AMR) activities, are now funded from the same restricted account, the Meter Replacement Account. For this reason, meter replacements and AMR system program activities will no longer be reported on an on-going basis in the IFR / CIP Status Report.

Leak Detection

A leak detection survey has been completed of the entire distribution system and major transmission lines. The survey utilized sonic leak detection equipment to detect audio frequencies created by water leakage. When suspected water leaks were detected, a leak noise correlator was used to confirm and precisely identify where the leak was located along the pipe. A total of 184 leaks were detected and verified. The final report is in the process of being finalized.

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.

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.

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

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.

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 complete.

Removal of Original Forestry Boiler

Various Support System and Facility Improvements

The employee parking lot at the Academy Avenue Administration Building has been rehabilitated. 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.

Safety improvements were made to the diesel and gasoline underground fuel storage tanks at the treatment plant with the installation of a leak monitoring system. The older system had stopped working and was obsolete. At Longview Reservoir, improvements were made to the existing radio system by installing a solar powered battery charging system that provides backup emergency power to the two-way radio repeater. In the event of a power loss, this system would provide backup power that would keep radio communications alive. At Academy Avenue, 85 lockers were purchased for operations personnel to address the lack of personal storage space at that facility. Also at Academy Avenue, the vehicle exhaust removal system in the garage was upgraded to improve the air quality for personnel.

New Egress from Forestry Garage

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. Compliance issues consist of upgrading fire sprinklers,

municipal alarms, fire rated doors, fire rated wall separations, and safety rails. Construction is complete and all Providence Water facilities are now in compliance with the new Rhode Island Fire Safety Code that was adopted in February 2004.

Watershed Storage Facility

Replacement of the 80-year-old Forestry Storage Building adjacent to the settling lagoons has been completed. The scope of work included asbestos abatement and demolition of the existing building, removal of an old abandoned underground fuel storage tank, design and construction of a new pre-engineered storage building, and a road sand granular storage shed. Associated site work included grading, paving, and security fencing.

Raw Water Supply

Fencing, Fire Lanes and Property Rehabilitation

Fencing was installed along sections of watershed property to replace deteriorated fencing and new concrete fence posts were installed to replace old posts that had weathered or were otherwise deteriorated. Some of the old gates at the fire lanes that lead into our property have been replaced to create a wider and more secure entrance for vehicles and materials. Fencing improvements are conducted by priority as determined by previously conducted inventories and evaluations. Construction for the rehabilitation of the access road and drainage system along the perimeter of Rockland Cemetery has been completed.

Treatment Plant Facilities

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. A new dishwasher and two new spectrometers were purchased to replace the old units. The dishwasher is used for washing laboratory equipment and the spectrometers are used daily in the routine testing of water samples.

The chemistry lab refrigeration unit was replaced with a new commercial grade unit. The existing unit was old and in need of constant repair. The refrigeration equipment is used for the storage of reagents, and drinking water and non-drinking water samples, which are stored at 4 degrees C for the preservation of sample integrity.

A spectrophotometer was purchased to replace an existing defective unit. The lab spectrophotometer is used for water testing on a daily basis.

A fluoride meter was purchased for the lab to monitor grab-samples from the treatment plant and the distribution system. The meter replaces an older unit.

A new lab high-performance atomic absorption spectrometer was purchased to replace an existing unit. The spectrometer is used for trace-metal-analysis on various plant, distribution system and watershed water samples, including tap water for Lead and Copper Rule monitoring. In addition, a new air compressor was purchased for use with the spectrometer because the existing unit was undersized for the new unit.

Two replacement lab bench top pH meters were purchased to replace older units.

Sludge lagoon at the beginning of dredging operations

Sludge lagoon dredging operations in progress

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.

Unloading of culvert sections for residual management system

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

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.

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 is being removed over a period of time under the current contract.

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.

Replace Sand Filters

Construction is in progress for the rehabilitation of all 18 filters at the treatment plant. The rehabilitative work will be performed in several phases for several years and is expected to be in construction to 2015.

The scope of work for the project includes reconstructing all 18 filters, raising the filter backwash troughs to provide greater filter media depth providing the option for future use of Granular Activated Carbon (GAC), completely removing the existing underground concrete roof slab structures covering the filters with construction of above-ground protective building structures in their place which will furnish full visibility and access to the entire surface areas of the filters.

The project also includes replacement of all filter piping, control valves and meters, installation of filter-to-waste piping, and the relocation and replacement of the 48" washwater pipe from inside the pipe gallery to an enclosed area to be constructed outside the building. Pipe gallery improvements will also consist of new lighting, HVAC, and a new outside access point that will improve safety conditions and facilitate construction activity of the project. The scope of work also includes the replacement of the existing antiquated proprietary SCADA system with a new state of the art non-proprietary system.

Excavation of slope for new wash water pipe

Coring for new wash water pipe

Installation of new 48 inch wash water pipe

Preparations for transfer to new SCADA system

Installation of new 48" wash water pipe

Configuration of new SCADA system

Transmission System

Replace 16" and Larger Valves

Five separate contracts were completed for replacing 198 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 twenty-one (121) 16" valves, nine (9) 20" valves, forty-one (41) 24" valves, twenty-two (22) 30" valves, four (4) 42" valves and one (1) 48" valve.

Removal of old 48 inch transmission gate valve

Pumping and Storage

Dean Estates Pump Station Upgrade

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. Construction has begun rehabilitate the Dean Estates Pump Station. The scope of work includes combining the Garden Hills and Dean Estates pressure zones into a single pressure zone, which will be served by one pump station. To accomplish this, a new water main will be installed at the Glen Hills Drive Bridge crossing RI 37. Plans are to rehabilitate only the Dean Estates Pump Station, which will allow for the abandonment of the Garden Hills Pump Station. The rehabilitation of the Dean Estates Pump Station 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.

Various Pumping and Storage Improvements

The generator enclosure for the Bath Street pump station required remedial work to upgrade some of the sound attenuation insulation that had deteriorated.

Distribution System

Replace Distribution Valves

Since 1996, 736 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, 1321 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

The EPA Lead and Copper Rule requires that systems monitor drinking water at the customer tap. In accordance with the Rule, if after corrosion control optimization is implemented, lead concentrations exceed an action level of 15 ppb in more than 10% of customer taps sampled, the system is required to replace lead service lines under its ownership. The regulations require that the utility must replace annually 7% of the total amount of lead services in the system. In accordance with EPA requirements, the Rhode Island Department of Health found that Providence Water exceeded the lead action level on September 30, 2006 (the date at the conclusion of the latest monitoring period) and was required to begin the annual replacement of 7% of its 25,000 lead services. Because of lead-time in gearing up for an undertaking of this magnitude, RIDOH and Providence Water agreed to a compliance schedule that fulfills the intent of the regulation whereby 14% of the lead services must be replaced over the two-year period ending September 30, 2008 and 7% annually thereafter. Replacement of lead services began in August of 2007 and Providence Water has to date replaced 8082 services under this new program effort. Since the inception of our formal IFR program in fiscal year 1996, 12889 lead services have been replaced.

Replace / Upgrade Water Mains

Since 1996, 54,989 feet of main were replaced at 136 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 136 locations, 58 were bleeder main replacements. These have since been eliminated, resulting in a substantial reduction in the wasting of water.

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.

Main Replacement Work in Progress

Support System Facilities

Rehabilitate Access Roads / Fencing - PW Property

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.

At Aqueduct Reservoir, the oldest sections of fence surrounding the tank have been targeted for replacement. To date, approximately 1500 feet of fence has been replaced with another 5000 feet of fence remaining. . At the treatment plant, two new main entrance gates are being installed at the west side of the plant to replace the two original older problematic units.

Raw Water Supply

90" Influent Conduit - Inspection

Design is substantially in progress. The 90" influent conduit that transports raw water from Gainer Dam to the treatment plant is approximately 75 years old. The project has been combined with the "Plant Influent and Aerator Rehabilitation".

Rehabilitate large dams (Regulating Reservoir Dam)

Design is in progress for remedial work to include regrading and providing armor protection along both the upstream and downstream slopes, repairing/replacing the existing stone walls along both the upstream and downstream slopes, inspecting and rehabilitating the concrete spillway, rehabilitating the concrete outlet structure, installing guardrails along each side of the roadway that traverses the crest of the dam, and replacing the current drainage system along the length of the dam. The engineering assessment prior to design consisted of an underwater dive inspection, both topographic and bathymetric surveys, and test borings.

Meter and Junction Chambers Rehabilitation

A contract has been awarded for improvements to the meter chamber structure at the base of the dam which will consist of 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 tunnel running under the dam. Inspection and evaluation of the exterior coating of the 60" influent conduits and the cast iron pipe supports that are partially submerged below the 60" influent conduits in the tunnel have been completed. The exterior of the pipe and the pipe supports will be rehabilitated in areas where deficiencies have been identified.

A contract has been awarded for improvements to the junction chamber which will consist of 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, replacing the air release valves, installing new lighting to improve lighting conditions inside the structure, and evaluation and rehabilitation of the exterior coating of the surfaces of the 60 inch supply mains as needed.

Treatment Plant Facilities

Plant Influent and Aerator Rehabilitation

Design is substantially in progress. The project is comprised of the following six projects.

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 age and condition. Anticipated work consists of replacing all 4 gate valves, 4 butterfly valves, electric actuators, valve stems and guides, and electrical ducts, including the installation of 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 allow diversion of influent water to bypass the aeration basin. Three 36-inch by 36-inch drain sluice gates are used to drain the aerator effluent conduit, influent control structure, influent tunnel, settled water conduit, and the mixer. A 72-inch by 72-inch influent venturi sluice gate is used during periods of extremely low influent flow for the purpose of diverting influent water through only a single venturi meter to maintain 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

Anticipated work consists of an internal inspection of the steel and concrete influent and effluent aerator conduits, performing an external inspection of the steel conduits, performing structural evaluations of the steel and concrete conduits, and performing any required rehabilitative work.

Aeration Basin Concrete Rehabilitation

The aeration basin is a reinforced concrete lined basin with cast in place concrete panels. The expansion joints between panels were sealed with caulking. 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 long term exposure to weather and treatment chemicals. Anticipated work includes replacement of the reinforced concrete lining, and inspection and structural evaluation of the associated concrete flow structures to identify needed rehabilitative work.

Aeration Basin - Replace Piping, Nozzles, and Drain Valves

Aeration is effected through a series of aerator nozzles and jets supplied by a cast iron piping network. 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 the total replacement of these components is not necessary, the budget will be modified.

Aerated, Settled, and Filter Influent Conduits

Design is substantially in progress. The project is comprised of the following four projects.

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 inspection and rehabilitation 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 evaluation 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, which would be 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 evaluation of the concrete emergency bypass tunnel, and addressing required rehabilitative work. A gate will be installed at the entrance of the bypass tunnel to prevent the future buildup of lime sludge.

Treatment Plant Facilities

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.

Chlorine Room 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.

A study is being conducted to investigate the possible conversion from the current gaseous chlorine feed system to a liquid chlorine feed system. The study will include several options for the location of a new liquid chlorine feed system.

Treatment Plant Facilities

Sedimentation Basins Rehabilitation

The sedimentation basins at the plant consist of two large open water surface basins that were part of the plant's original construction back in the 1920s. The massive area of concrete walls and slabs making up the basin have deteriorated over time and initially our IFR plans were to rehabilitate and renew them back to nearly original condition. In light of the outmoded nature of this sedimentation process by today's standards, we have reconsidered this approach. Providence Water is considering a new modern-design settling system to be installed in their place. Such an installation would also include the automatic mechanized removal of sludge on a continuous basis, eliminating sludge buildup and cleaning and handling requirements. This project is at this point conceptual in nature only.

Treatment Plant Architectural Improvements

Various architectural improvements are needed at the Treatment Plant. Flooring systems in the treatment plant need varying levels of rehabilitative work, and in some areas floor tiles containing asbestos need to be removed and replaced with new flooring. Ventilation needs to be improved in the lime feeder room.

Architectural improvements have been completed that included new ceiling tiles and lighting in the auditorium, lobby, and conference room; upgrading the audio-visual equipment in the auditorium; replacing the public address system throughout the plant; replacing handrails and stair treads; and various architectural improvements to personnel spaces.

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IFR PROJECT STATUS REPORT

PROJECT COST AND SCHEDULE DETAILS

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 06/30/10	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			
Gainer Dam stonewall rehabilitation	Planning	In House	Jan 02	100%	Jun 02	NA	$591,601	NA
	Design	In House	Jun 02	100%	Apr 07			
	Construction	Apr 07	May 08	100%	Apr 10			
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	In House	Mar 02	100%	Mar 02	NA	$67,200	NA
	Design	NA	NA	NA	NA			
	Construction	In House	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	$747,134	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	NA	$134,171	NA
	Design	Apr 02	May 02	100%	Jul 03			
	Construction	Jul 03	May 04	100%	Jun 06			

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PROJECTS COMPLETED (cont)								
Raw Water Supply (cont)								
Raw Water Booster Pump Station Electrical Upgrades	Planning	In House	Jul 05	100%	Sep 05	NA	$783,064	NA
	Design	In House	Sep 05	100%	Mar 06			
	Construction	Apr 06	Jun 06	100%	Dec 07			
Large Dam Improvements	Planning	*various projects*				NA	$127,987	NA
	Design							
	Construction							
Evaluation of secondary dams	Planning	NA - Study is complete				NA	$71,961	NA
	Design							
	Construction							
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			
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			
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			

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PROJECTS COMPLETED (cont)								
Treatment Plant Facilities (cont)								
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			
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	In House	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			
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							
Rehabilitate Lime Transfer System	Planning	In House	Jun 01	100%	Feb 02	NA	$2,058,020	NA
	Design	Feb 02	Jun 02	100%	Sep 03			
	Construction	Oct 03	Jun 04	100%	Nov 05			

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PROJECTS COMPLETED (cont)								
Treatment Plant Facilities (cont)								
Rehabilitate Fluoride Transfer System	Planning	In House	Jun 01	100%	Feb 02	NA	$882,008	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	NA	$918,449	NA
	Design	Jun 01	Jun 01	100%	Jul 03			
	Construction	Jul 03	May 04	100%	Jun 06			
Replace water heaters for process water	Planning	In House	May 01	100%	Dec 01	NA	$91,041	NA
	Design	Apr 02	May 02	100%	Jul 03			
	Construction	Jul 03	May 04	100%	Jun 06			
Treatment Plant - heating system upgrade	Planning	In House	Aug 02	100%	Sep 02	NA	$539,334	NA
	Design	Oct 02	Oct 02	100%	Jul 03			
	Construction	Jul 03	May 04	100%	Jun 06			
Wash water tank - structural rehabilitation	Planning	In House	Dec 02	100%	Feb 03	NA	$416,223	NA
	Design	Feb 03	Sep 03	100%	Apr 05			
	Construction	Apr-05	Oct 05	100%	Dec 06			
Service Water Tank - inspection / rehabilitation	Planning	In House	Sep 06	100%	Oct 06	NA	$3,229	NA
	Design	In House	Sep 07	100%	Sep 07			
	Construction	NA	Oct 07	100%	Nov 07			
Clarification Optimization (Pumped Flash Mixer System)	Planning	In House	Nov 03	100%	Jul 03	NA	$1,174,211	NA
	Design	Feb 03	Mar 03	100%	Sep 04			
	Construction	Sep 04	Jun 05	100%	Jul 08			
Process Control and Control System Upgrades	Planning					NA	$1,646,484	NA
	Design	Work is Ongoing - Various Upgrades						
	Construction							
Transmission System								
102" Aqueduct-Investigation/Rehabilitation	Planning	In House	Dec 96	100%	Feb 98	NA	$6,038,079	NA
	Design	In House	Nov 98	100%	Oct 99			
	Construction	In House	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			
102" aqueduct - inspection / rehabilitation	Planning	In House	Sep 04	100%	Dec 04	NA	$8,261,474	NA
	Design	Dec 04	Sep 05	100%	Dec 07			
	Construction	Dec 04	Nov 05	100%	Dec 07			
78" aqueduct - inspection / rehabilitation	Planning	In House	Sep 04	100%	Dec 04	NA	$6,726	NA
	Design	Dec 04	Oct 06	100%	Nov 08			
	Construction	NA	Oct 07	100%	Nov 08			
Improvements to structures "D" and "E"	Planning	In House	Sep 04	100%	Dec 04	NA	$6,726	NA
	Design	Dec 04	Jan-07	100%	Nov 08			
	Construction	-----	-----	-----	-----			

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PROJECTS COMPLETED (cont)								
Transmission System (cont)								
66" Transmission Main Inspection	Planning	In House	Sep 06	100%	Jun 07	NA	$48,530	NA
	Design	In House	Sep 07	100%	Sep 07			
	Construction	NA	Dec 07	100%	Jan 08			
60" Transmission Main Inspection	Planning	In House	Sep 06	100%	Jan 08	NA	$48,530	NA
	Design	NA	NA	NA	NA			
	Construction	NA	NA	NA	NA			
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	In House	Jul 98	100%	Dec 98	NA	$105,723	NA
	Design	In House	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			
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	$11,989	NA
	Design	NA	NA	NA	NA			
	Construction	Sep 01	Oct 01	100%	Nov 01			
Ridge Road Tank - inspection / rehabilitation	Planning	In House	Sep 06	100%	Nov 06	NA	$9,687	NA
	Design	NA	NA	NA	NA			
	Construction	NA	NA	NA	NA			
Aqueduct Pump Station Rehabilitation	Planning	In House	Oct 02	100%	Mar 03	NA	$2,353,475	NA
	Design	Jun 03	Dec 03	100%	Sep 04			
	Construction	Dec 04	Apr-05	100%	Nov 07			

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PROJECTS COMPLETED (cont)								
Pumping and Storage (cont)								
Neutaconkanut reservoir - inspection / rehabilitation	Planning	In House	Dec 02	100%	Feb 03	NA	$2,501,158	NA
	Design	Feb 03	Sep 03	100%	Apr 05			
	Construction	Apr-05	Oct 05	100%	Jun 08			
Distribution System								
Various Distribution System Improvements	Planning	*various projects*				NA	$4,510,922	NA
	Design							
	Construction							
Replace water meters	Planning	80,546 meters replaced				NA	$13,841,637	NA
	Design							
	Construction							
Leak Detection	Planning	In House	May 01	100%	Jan 02	NA	$189,675	NA
	Design	In House	Jun 07	100%	May 08			
	Construction	May 08	Oct 08	100%	Sep 10			
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	$580,539	NA
	Design							
	Construction							
Remove / replace underground storage tanks	Planning	*various projects*				NA	$629,948	NA
	Design							
	Construction							
Forestry Building - heating system upgrade	Planning	In House	Aug 02	100%	Sep 02	NA	$299,568	NA
	Design	Oct 02	Oct 02	100%	Jul 03			
	Construction	Jul 03	May 04	100%	Jun 06			
Various Support System and Facility Improvements	Planning	*various projects*				NA	$327,019	NA
	Design							
	Construction							
Fire Safety System Improvements	Planning	In House	Jul 04	100%	Jun 06	NA	$1,888,610	NA
	Design	In House	Apr 05	100%	Sep 06			
	Construction	In House	Apr 05	100%	Jul 07			
Watershed Storage Facility	Planning	In House	Jul 04	100%	Nov 05	NA	$934,141	NA
	Design	In House	Oct 05	100%	Feb 08			
	Construction	Feb 08	Jul 08	100%	Sep 09			

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CONSTRUCTION								
Raw Water Supply								
Fencing, fire lanes, property rehabilitation	Planning Design Construction	Work is Ongoing - Various Projects				NA	$8,100	NA
Treatment Plant Facilities								
Lab Improvements	Planning Design Construction	Work is Ongoing - Various Projects				NA	$87,352	NA
Sludge handling / disposal	Planning Design Construction	In House Jan 95 Sep 97	Jan 96 Feb 96 Jun 98	100% 100% 60%	Nov 02 Feb 03 (Jul 16)	$27,000,000	$20,524,516	$6,475,484
Replace sand filters	Planning Design Construction	In House Feb 05 Feb 09	Jul 03 Oct 05 Sep 09	100% 100% 25%	Nov 04 Jan 09 (Mar 15)	$45,000,000	$15,782,671	$29,217,329
Transmission System								
Replace 16 inch & larger valves	Planning Design Construction	Work is Ongoing - 198 large valves replaced				(1)	$5,737,911	NA
Pumping and Storage								
Dean Estates Pump Station upgrade	Planning Design Construction	In House Jun 05 Apr 10	Dec 04 Sep 05 (Aug 10)	100% 100% 0%	Feb-05 Apr 10 (Feb 11)	$1,400,000	$200,213	$1,199,787
Various Pumping and Storage Improvements	Planning Design Construction	*various projects*				NA	$42,462	NA
Distribution System								
Replace distribution valves	Planning Design Construction	Work is Ongoing - 736 valves replaced				(1)	$1,935,064	NA
Replace fire hydrants	Planning Design Construction	Work is Ongoing - 1,321 fire hydrants replaced				(1)	$3,397,865	NA
Replace lead services	Planning Design Construction	Work is Ongoing - 12889 lead services replaced				(1)	$45,885,810	NA
Replace / upgrade water mains	Planning Design Construction	Work is Ongoing - 54,989 feet of main replaced				(1)	$8,532,862	NA
Support System Facilities								
Rehabilitate Access Roads and Fencing - PW Property	Planning Design Construction	*various projects*				NA	$1,143,133	NA

(1) Distribution work is ongoing and long term

IFR STATUS REPORT	SCHEDULE					COST		
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DESIGN								
Raw Water Supply								
90" influent conduit	Planning	In House	Aug 01	100%	Jun 06	$100,000	$41,328	$58,672
	Design	Jun 06	May 07	90%	(Dec 10)			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Rehabilitate large dams (Regulating Reservoir Dam)	Planning	In House	Jan 07	100%	Feb 07	$1,700,000	$69,867	$1,630,133
	Design	Feb 07	Oct 07	75%	(Aug 10)			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Meter and Junction Chamber Rehabilitation	Planning	In House	Feb 08	100%	Sep 08	$500,000	$110,805	$389,195
	Design	Sep 08	Sep 08	100%	Jun 10			
	Construction	Jun 10	(Oct 10)	- - - - -	- - - - -			
Treatment Plant Facilities								
Plant Influent and Aerator Rehabilitation	Planning	In House	May 01	100%	Jun 06	$6,400,000	$318,051	$6,081,949
	Design	Jun 06	May 07	90%	(Dec 10)			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
Aerated, Settled, and Filter Influent Conduits	Planning	In House	May 01	100%	Jun 06	$1,000,000	$60,853	$939,147
	Design	Jun 06	May 07	90%	(Dec 10)			
	Construction	- - - - -	- - - - -	- - - - -	- - - - -			
PLANNING								
Treatment Plant Facilities								
Process meter replacement	Planning	*various projects*				NA	$84,716	NA
	Design							
	Construction							
Chlorine Room Upgrades	Planning	In House	Sep 05	25%	- - - - -	$200,000	$46,433	$153,567
	Design	In House	Sep 05	25%	- - - - -			
	Construction	In House	Sep 05	25%	- - - - -			
PENDING								
Treatment Plant Facilities								
Sedimentation Basins Rehabilitation	Planning	No Action				$9,100,000	$0	$9,100,000
	Design							
	Construction							
Treatment Plant Architectural Upgrades	Planning	*various projects*				$400,000	$283,765	$116,235
	Design							
	Construction							

Total IFR Expenditures **$190,534,210**

CIP PROJECT STATUS REPORT

PROJECT NARRATIVES

Raw Water Supply

Alternate Source of Supply Study

In collaboration with the RIWRB, an initial phase of a study of potential alternate supply sources was completed. This initial phase involved a preliminary assessment of the potential feasibility of alternate redundant supply sources. The findings suggested that the best approach for obtaining supplemental water might be through the development of multiple relatively low yielding sources including new groundwater sources, abandoned municipal wells, abandoned industrial wells, and possible river sources. A supplemental source would reduce the vulnerability of a single supply source.

Providence Water continued to collaborate with the Rhode Island Water Resources Board on the next phase of this project. This phase involved a study to determine the need, feasibility, and reasonableness of developing the sources identified in the previous phase. The intent of this study was to determine which, if any sources could justifiably be developed as supplemental sources to the existing PW system. The study was awarded in June 2001, commenced in September 2001, and was completed in May 2004.

Treatment Facilities

Electronic Treatment Process Monitoring Equipment

Twenty (20) water quality monitoring particle counters have been purchased and installed. These particle counters have been installed to monitor each of the plant's eighteen filters and the influent and effluent water. Six (6) pH meters have been purchased and installed to monitor pH at various locations in the plant.

Treatment Plant - Install Pipes for Effluent Metering / Sampling

The installation of 12 stainless steel pipes along the length of the clearwell to be used as sampling points for water quality collection is complete.

Transmission System

Install Transmission Mains (Western Cranston)

Several transmission main extensions in this area of the system were installed in order to reinforce the transmission grid. Construction has been completed for the installation of 10,000 feet of 16-inch pipe along Pippin Orchard Road and 3,300 feet of 24-inch main along Wilbur and Conley Avenues.

Installation of 24" main on Conley Avenue

Installation of 24" tapping sleeve and valve

78" and 102" Valves for Wholesale Connections

A design/build services contract for the installation of flow controls for the 78"/102" Supplemental Tunnel & Aqueduct has been completed. Installation of the 102" flow controls, including the installation of a 102" butterfly valve and bypass piping, was completed in the fall of 2002. Construction of the 78" flow controls, which included a new 78" butterfly valve and bypass piping, was completed in the winter of 2007.

Lowering the 102" valve into place

Installation of these controls enables redundant supply routes to the Kent County Water Authority and the Warwick Water Department wholesale connections. This provides the ability to maintain a continuous supply to these connections in the event of a failure in any section of the aqueduct and provides the ability to shutdown all

sections of the aqueduct for inspection, maintenance, or repair without interrupting service to these connections.

Emergency Interconnection - Structure D

Construction of an emergency interconnection between Providence Water and the Kent County Water Authority (KCWA) was completed. This interconnection provides an important secondary feed source enabling Providence Water to supply Kent County in the event the Clinton Avenue connection or pump station were to become disabled, and also allowing Kent County to supply a quantity of water to the Providence Water system under certain emergency events. This interconnection also allowed the installation of the 78" aqueduct valve in the vicinity of Kent County's Clinton Avenue connection, providing the ability to isolate the aqueduct on either side of the connection, and the opportunity to shut down and drain the 78" aqueduct for conducting its first ever interior inspection and needed repairs. The connection consisted of the installation of submersible pumps within the aqueduct shaft at Structure D, along with the necessary suction and discharge piping to transfer the pumped water to the Kent County Water Authority System. Providence Water worked with Kent County to obtain partial funding reimbursement through the Rhode Island Water Resources Board's emergency interconnection grant program.

The project was virtually complete and the pumps operated trouble-free for the approximately 3 month period during the installation of the 78" valve and inspection of the aqueduct. During subsequent pump exercising runs, one of the pumps failed. The pump was removed and repaired under warranty by the manufacturer. Following this, the second of the two pumps experienced a similar type failure. This pump was also removed and repaired under warranty by the manufacturer. The pump station is now complete and fully operational.

Pumping and Storage

Neutaconkanut Hill Booster Pump Station

Construction is complete for the installation of a booster pump station in the Neutaconkanut Hill area of Johnston to boost the pressure in the area to Providence Water standards. This is a high elevation area of the system that had been tied into the system at the request of the Town of Johnston due to concerns about potential well contamination and previously experienced unacceptably low pressure during periods of high demands.

Distribution System

Various Main Extensions For System Improvements

A new ductile iron main was installed in the King Phillip Street area of Providence. The 1234 foot extension eliminated the need to repair a water main break under the eastbound lane of RI Route 6. The old cast iron main was abandoned in place.

AMR System

In accordance with the Report and Order of Docket Number 3832, the funding for future water meter replacements is to be from a restricted Meter Replacement Account rather than from the IFR Account. All meter replacements, and all Automatic Meter Reading (AMR) activities, are now funded from the same restricted account, the Meter Replacement Account. For this reason, meter replacements and AMR system program activities will no longer be reported on an on-going basis in the IFR / CIP Status Report.

Support System Facilities

Forestry Building - Office Construction

Offices have been constructed in the mezzanine area of the garage to house forestry support staff. Construction is complete.

New Fencing and Roads - PW Property

New security fencing was installed around 10 air vents and the east portal for the portion of the supplemental tunnel and aqueduct located between Scituate and Cranston. Additionally, a contract has been completed to install approximately 1500 feet of new fence along the Gainer Dam access road and spillway channel. The project was needed to limit access to the edge of the spillway channel for concerns over safety. Security fencing was installed along Route 116 across from the Purification Works to keep vehicular traffic from entering the area at the base of Gainer Dam. Construction is complete for the installation of a bar gate on Providence Water owned property off of Pontiac Ave. to prohibit unwarranted access.

Security Upgrade at Treatment Plant and Facilities

Construction is complete for security improvements to all Providence Water Facilities in conjunction with recommendations of a previously conducted system-wide security assessment. A security room has been constructed at the treatment plant to monitor all aspects of security at the plant and associated satellite facilities. A security room with monitoring consoles has been constructed at both the Cranston and Academy Avenue administration buildings to monitor activities at each facility. Construction at the plant, administration buildings, and remote facilities consisted of the addition of cameras, motion detectors, lighting, fencing, intrusion detection, and access control.

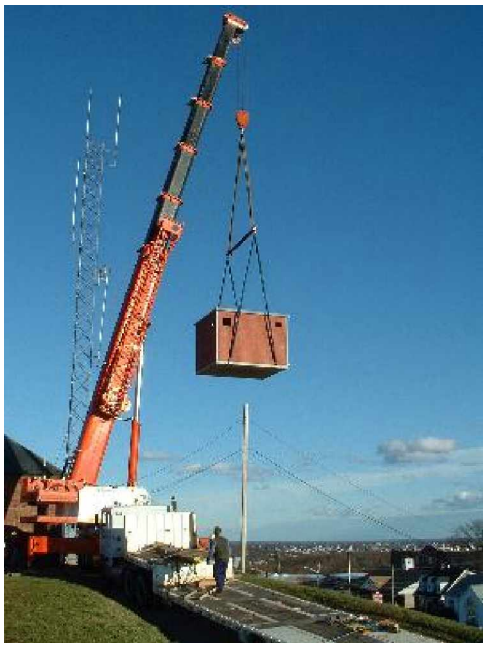
Underground and aerial fiber optic cable was installed from four Providence Water facilities west of RI Rt. 116 to the treatment plant. The fiber optic cable is being used for carrying video, security access, and SCADA to the treatment plant from the Gainer Dam gatehouse, the Raw Water Booster pumping station, the junction chamber, and the meter chamber.

Various Capital Projects

A project has been completed in which surge protectors were installed at all pump stations to help protect the instrumentation systems and pump station controls from damage caused by lightning strikes.

A water sampling station and security cabinet for the Bristol County Water Authority (BCWA) 30-inch connection has been installed. The station will be used as one of the points for obtaining samples in the system for water quality testing.

A new pre-engineered concrete communications shed was installed at the Longview Reservoir. The new communications shed provides a dedicated and secure location for the communication equipment that had been previously installed inside the Longview Reservoir gatehouse.



Lowering Communications Shed to Foundation

Distribution System

MLOG Leak Detection

Providence Water has purchased and is installing an automated system-wide leak detection system throughout its distribution system. Approximately 3000 of the 7200 MLOGS have been installed in the system. MLOG leak detection sensors are installed on house service lines (on every 5 to 10 services in the distribution system depending on the distance between laterals) for recording and logging acoustic sounds generated by leaks on water mains, services, and appurtenances. The data is transmitted by radio and collected by drive-by radio-read controllers.

Hydrant Locks

Providence Water has purchased and has started installing hydrant locks in strategic areas of the distribution system. Approximately 300 of the 1200 locks have been installed on hydrants to prevent the unauthorized use of water. Providence Water has commonly experienced difficulty with street sweepers filling their trucks without authorization and with vandals opening hydrants on hot days during the summer. Hydrants opened by untrained individuals can cause a disruption in the flow of water resulting in water hammer and water quality problems. In addition the loss of unmetered treated water results in lost revenue.

Support System Facilities

GIS System and base mapping conversion system

A report consisting of a needs assessment, a feasibility study, and development of an implementation plan was finalized. The report provided Providence Water with an overall plan for implementing a Geographic Information System (GIS). A large-scale plotter and plan-size document scanner/reproduction equipment were purchased for mapping needs as part of the new GIS system. This equipment allowed for the creation of maps and plans, and scanning of existing plans for inclusion in the GIS. An upgrade to Providence Water's hydraulic modeling software was also purchased that will also allow modeling to be integrated with GIS.

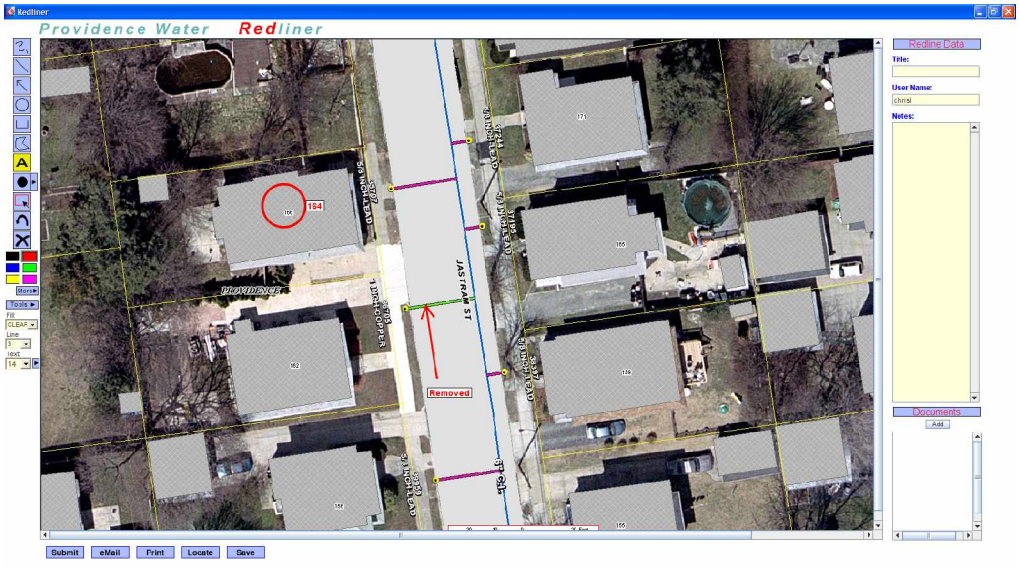
Also completed was a project to gather asset location information in Western Cranston using Global Positioning System (GPS) technology. This project provided GIS mapping of facilities in the acquired Western Cranston portion of the system for which information was lacking. This project area served as part of a pilot program for the longer-term development of an overall GIS program for our entire system.

An aerial flight of the Providence Water service area was completed along with the subsequent creation of orthophotos and planimetrics used to create a base map for the distribution system in GIS.

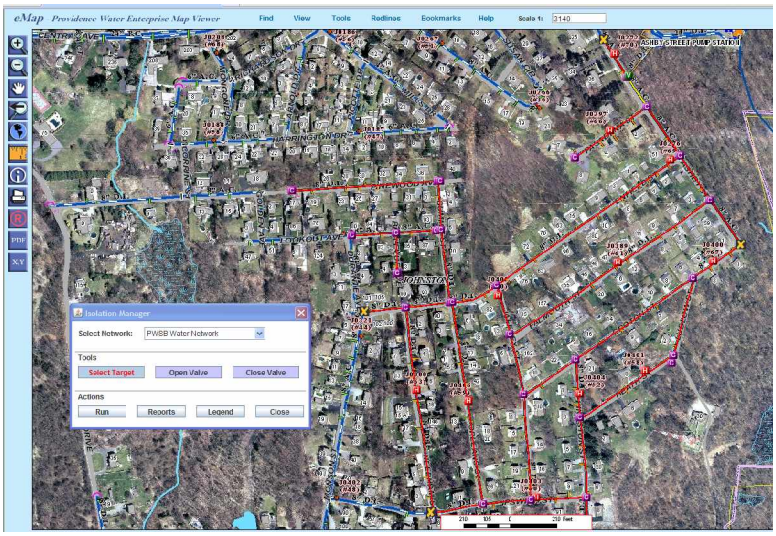
The implementation of the full-scale system wide enterprise GIS is nearing completion. The project consisted of the conversion of the existing distribution system asset records that resided in various software programs and paper records into one centralized database and mapping system. Scanning of older distribution system as-built drawings is in progress. The as-built construction records will be linked with the GIS mapping to provide a higher degree of construction detail if needed. The project also included business process modeling to optimize and customize the design of the system, as well as the purchase and development of all computer hardware, software applications, and data needed to support a fully functional, customized GIS program. Also included was the development of a customized intranet viewer that provides easy access to the data for the entire organization. The integration of the Hansen asset data and CSTAR customer billing data is approximately 90% complete. The GIS mapping is being verified and adjusted as necessary to ensure full consistency with all of our paper records.

We are in the process of investigating and evaluating competing mobile technologies to provide for field access to records and maps, and to record and update field data. An RFP is being prepared for mobile deployment of the GIS. Three GPS units were purchased to collect and update locational data in conjunction with the on-going lead service replacement program. This collected data will be converted to GIS data for display in the enterprise GIS.

GIS Viewer Under Development



Redline tool for GIS Viewer



Isolation Manager tool for GIS Viewer

Treatment Plant Facilities

Install New CO2 System

Design is in progress for the installation of a new planned carbon dioxide (CO2) bulk storage and chemical feed system at the treatment plant. The system is intended to increase both the level of dissolved inorganic carbon (DIC) and the alkalinity of the finished water which will stabilize the pH throughout the distribution system with the objective of reducing lead levels.

Scituate Avenue Transmission Main (Western Cranston)

Design is in progress for the installation of approximately 3500 feet of 16-inch water main along Scituate Avenue that will close a major transmission loop in the system and provide a secondary feed route to a large area of the system presently dependent on a single feed main. The transmission main installation is part of the overall improvement plan for the Western Cranston area of the system. Design is also in progress for the installation of approximately 1,000 feet of 20-inch transmission main to provide a needed interconnection between a 24-inch section of transmission main in Scituate Avenue and our 20-inch main in Plainfield Pike. A RIDEM wetlands permit has been obtained along this route for a stream crossing.

Transmission System

Western Cranston - Water System Improvements

This is a general planning category for improvements in the Western Cranston area of the system. This section of the system was acquired from Cranston in 1996. Various improvements are needed to bring this area of the system up to system standards. The improvements will consist of increased pumping and transmission capacity, expanded storage, and improvements in the transmission and distribution system. The improvements will be more specifically identified in this report as they take place.

Support System Facilities

Organizational and Facility Assessment

A study was completed that evaluated the physical condition and space adequacy of our current office and maintenance facilities to assess their continuing suitability for PW operations. A commercial real estate company has been contracted to search for suitable site options for the relocation of our facilities.

CIP PROJECT STATUS REPORT

COST AND SCHEDULE DETAILS

CIP 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 06/30/10	Funds Needed to Complete
PROJECTS COMPLETED								
Raw Water Supply								
Alternate Source of Supply Study	Planning	Jul 96	May 97	100%	Jun 04	NA	$643,794	NA
	Design	NA	NA	NA	NA			
	Construction	NA	NA	NA	NA			
Treatment Facilities								
Electronic treatment process monitoring equipment	Planning	In House	Apr 95	100%	Jun 95	NA	$111,157	NA
	Design	In House	Jul 95	100%	Nov 95			
	Construction	Aug 95	Feb 96	100%	Jun 97			
Treatment Plant - Install pipes for effluent metering / sampling	Planning	In House	Jan 96	100%	Mar 96	NA	$3,444	NA
	Design	In House	Dec 97	100%	Dec 97			
	Construction	In House	May 98	100%	May 98			
Transmission System								
Install Transmission Mains (W. Cranston)	Planning Design Construction	*various projects*				NA	$2,007,334	NA
78" & 102" Valves for Wholesale Connections	Planning	In House	Feb 01	100%	Nov 01	NA	$1,737,502	NA
	Design	Oct 01	Feb 02	100%	Jan 08			
	Construction	Oct 01	Jul 02	100%	Jan 08			
Emergency Interconnection - Structure D	Planning	In House	Dec 06	100%	Apr 07	NA	$474,475	NA
	Design	In House	Dec 06	100%	Oct 07			
	Construction	In House	Jul 07	100%	Oct 07			
Pumping and Storage								
Neutaconkanut Hill Booster Pump Station	Planning	In House	Oct 97	100%	Jan 98	NA	$202,135	NA
	Design	In House	Jan 98	100%	Sep 98			
	Construction	Sep 98	Dec 98	100%	Sep 99			
Distribution System								
Various Main Extensions for System Improvements	Planning Design Construction	*various projects*				NA	$70,584	NA
AMR system	Planning	In House	July 94	100%	July 96	NA	$6,849,859	NA
	Design	In House	Apr 98	100%	Dec 98			
	Construction	In House	Aug 99	100%	Dec 08			
Support System Facilities								
Forestry Building - Office Construction	Planning	In House	Apr 96	100%	Mar 97	NA	$18,325	NA
	Design	In House	Apr 97	100%	Dec 97			
	Construction	In House	Apr 97	100%	Jun 98			
New fencing and roads - PW property	Planning	In House	Apr 97	100%	Jun 97	NA	$79,560	NA
	Design	In House	Jun 97	100%	Aug 97			
	Construction	Oct 97	Mar 98	100%	Apr 98			
Security upgrade at treatment plant and facilities	Planning	May 97	Dec 97	100%	Nov 99	NA	$4,051,894	NA
	Design	Jul 01	Dec 01	100%	Aug 02			
	Construction	Mar 02	Mar 02	100%	Jun-08			

CIP 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 06/30/10	Funds Needed to Complete
PROJECTS COMPLETED (cont)								
Support System Facilities (cont)								
Various Capital Projects	Planning Design Construction	*see narrative*				NA	$207,611	NA
CONSTRUCTION								
Support System Facilities								
MLOG Leak Detection	Planning Design Construction	In House Dec 09 NA	Jun 09 Dec 09 Mar 10	100% 100% 50%	Dec 09 Mar 10 (Jun 12)	$1,000,000	$47,496	$952,504
Hydrant Locks	Planning Design Construction	NA NA In House	NA NA Mar 10	NA NA 25%	NA NA (Aug 11)	$360,000	$104,023	$255,977
Support System Facilities								
GIS System and base mapping conversion system	Planning Design Construction	Jan 02 Jan 04 Apr 05	Feb 02 Apr 04 Nov 05	100% 100% 90%	Jun 03 Dec 06 (Dec 12)	$5,000,000	$3,239,549	$1,760,451
DESIGN								
Treatment Plant Facilities								
Install New CO2 System	Planning Design Construction	In House Mar 10 - - - - -	Oct 01 Apr 10 - - - - -	100% 30% - - - - -	Jan 10 (Dec 10) - - - - -	$3,000,000	$30,505	$2,969,495
Transmission System								
Scituate Ave. Transmission Main (W. Cranston)	Planning Design Construction	In House In House - - - - -	Oct 01 Jan 10 - - - - -	100% 50% - - - - -	Jan 10 (Jan 11) - - - - -	$600,000	$34,344	$565,656
PLANNING								
Transmission System								
Western Cranston - water system improvements	Planning Design Construction	*various projects*				NA	$219,529	NA
Support System Facilities								
Organization and Facility Assessment	Planning Design Construction	*Project is a study*				NA	$119,246	NA

Total CIP Expenditures **$20,252,365**