CHAPTER 10

CAPITAL IMPROVEMENTS

INTRODUCTION

This chapter presents the proposed schedule to implement the 6-year and 10-year Capital Improvement Plan (CIP) in accordance with the requirements of WAC 246-290. Water system capital improvements have been scheduled and prioritized on the basis of water quality concerns, growth, regulatory requirements, component reliability, system benefit, and financial priority. Additional projects for the 20-year planning period have also been identified; however, projects are currently only scheduled through 2025. When the Plan is updated at the end of the 6-year and 10-year planning periods, the projects presented for the 20-year planning period should be reevaluated and scheduled for the subsequent planning period if necessary.

The estimated cost of each of the projects is given in this chapter. All costs are presented in 2015 dollars and include engineering, administration and contingency. It is assumed in each estimate that complete road restoration will be required for pipe replacement projects. Coordination with other infrastructure or road paving projects may reduce costs and will be considered in planning for the construction of future facilities.

In the future, other projects may arise that are not identified as part of the District's CIP. Such projects may be deemed necessary for ensuring water quality, preserving emergency water supply, accommodating transportation improvements proposed by other agencies, or addressing unforeseen problems with the District's water system. Due to budgetary constraints, the completion of these projects may require that the proposed completion date for projects in the CIP be rescheduled. The District retains the flexibility to reschedule proposed projects and to expand or reduce the scope of proposed projects, as best determined by the District's Commissioners when new information becomes available for evaluation. Each capital improvement project should be reevaluated to consider the most recent planning efforts as the proposed completion date for the project approaches.

The CIP is classified into four categories:

- Miscellaneous Projects (M)
- PRV Replacement Program (P)
- Seismic Upgrade Program (S)
- Repair and Replacement Program (R)

Each category is further divided into a detailed list of projects presented chronologically over the 10-year planning period. Projects after the year 2025 are included in the CIP; however, these projects do not have a fully developed cost estimate since the projects are

beyond the 10-year planning period. Cost estimates are provided for projects identified for the 10-year planning period. A water base map illustrating the locations of all CIP projects for the 10-year planning period is presented at the back of this Plan.

MISCELLANEOUS PROJECTS (M)

M-1: EASEMENT ISSUES (6-YEAR)

Estimated Project Cost: $50,000 ($25,000 for Water Utility and $25,000 for Wastewater Utility)

The project plans to allocate funds to address easement issues, including easement encroachment and acquiring the easements for existing water mains that are unrecorded.

M-2: RWA SOURCE DEVELOPMENT (20-YEAR)

Estimated Project Cost: $300,000

The District plans to continue to consider the option of RWA as a future source of supply. The project allocates funds for continued study on developing the RWA water right as an additional supply source.

M-3: LAKE FOREST PARK RESERVOIR AND PUMP HOUSE IMPROVEMENTS (6-YEAR)

Estimated Project Cost: $250,000

Upgrades will be constructed at both the reservoir and pump house sites. The generator at the pump house is nearing the end of its useful life and replacement parts are no longer easily acquired. The existing generator will be replaced. The pump house will get electrical system upgrade and VFD motors. The reservoir has exterior elements that need to be recoated.

M-4: WATER SYSTEM PLAN EXTENSION (6-YEAR)

Estimated Project Cost: $20,000

The District plans to file for a 4-year extension of their Water System Plan in 2021 in compliance with WAC 246-290-100.

M-5: LEAK DETECTION (ANNUAL)

Estimated Annual Project Cost: $5,000

The District plans to conduct leak detection annually in order to minimize lost water. Leak detection will be performed at areas of suspected leaks, known maintenance problems areas, and critical water main locations.

M-6: NORWAY HILL RESERVOIR INTERIOR RECOATING AND SEAL WELDING (6-YEAR)

Estimated Project Cost: $1,270,000

Typically, interior coatings last approximately 20 to 25 years. The interior of the reservoir was inspected in 2015 and revealed corrosion on the interior and at the joints of the roof rafters. Seal welding will be performed to prevent additional corrosion at the roof joints and the entire interior will be recoated.

M-7: INGLEMOOR STANDPIPE EXTERIOR AND INTERIOR RECOATING (6-YEAR)

Estimated Project Cost: $1,020,000

Typically, exterior coatings last approximately 15 to 20 years. The District plans to recoat the Inglemoor Standpipe as needed.

M-8: INGLEMOOR RESERVOIR 3 EXTERIOR RECOATING (10-YEAR)

Estimated Project Cost: $620,000

Typically, exterior coatings last approximately 15 to 20 years. The District plans to recoat the Inglemoor Reservoir 3 as needed.

M-9: WESTHILL STANDPIPE INTERIOR RECOATING (10-YEAR)

Estimated Project Cost: $330,000

Typically, interior coatings last approximately 20 to 25 years. The District plans to recoat the reservoir as needed.

M-10: KINGSGATE RESERVOIR INTERIOR RECOATING (10-YEAR)

Estimated Project Cost: $485,000

Typically, interior coatings last approximately 20 to 25 years. The District plans to recoat the reservoir as needed.

M-11: HEADQUARTERS SKYLIGHT AND COATINGS (6-YEAR)

Estimated Project Cost: $275,000

The District headquarters will undergo various improvements. The building has approximately a dozen skylights that are leaking and will be repaired. The exterior of the building will also be painted. There will be various other upgrades for maintenance throughout the headquarters.

M-12: 112TH PRV AND HYDROTURBINE PROJECT (10-YEAR)

Estimated Project Cost: $1,254,000

The District investigated replacing several existing control vault stations with one regional control vault. The regional vault would be located on a private parcel on 112th Avenue NE and replace Master Meter 3, include approximately 270 linear feet of new pipe, and a hydroturbine. The turbine would reduce the head of the water from the total pipeline while producing electricity. The turbine's payback period is approximately 9 years.

M-13: 366 ZONE WATER MAIN (10-YEAR)

Estimated Project Cost: $520,000

The District plans to install approximately 2,000 linear feet of 12-inch ductile iron water main from PRV 35 to the 366 Zone. It is anticipated that this PRV will need to be relocated in the future due to roadway expansions in Kirkland.

M-14: 104TH STREET MASTER METER 4 UPGRADES (10-YEAR)

Estimated Project Cost: $130,000

Master Meter 4 will be upgraded to allow more water to flow into the 601 Zone directly from the Tolt. The upgrades will include upsizing the existing Cla-Val and connection piping size to the Tolt to allow more flow. This project improves system reliability as it would be an additional point of withdrawal from the Tolt if the Inglemoor transmission main went out of service.

M-15: WATER SYSTEM PLAN (10-YEAR)

Estimated Project Cost: $100,000

The District plans to update its Water System Plan in 2025 in compliance with WAC 246-290-100.

M-16: ST. EDWARDS WATER MAIN LOOP (10-YEAR)

The District plans to install approximately 2,800 linear feet of 12-inch ductile iron water main from St. Edwards State Park to Juanita Drive NE. The Water main will be located in an existing sewer easement and will complete a loop to better serve the 601W Zone.

Estimated Project Cost: $530,000

M-17: 366 ZONE RESERVOIR AND BOOSTER STATION (10-YEAR)

The District plans to construct a new 4 MG reservoir and booster station at the site of Evergreen Hospital to serve planned urban development. The Totem Lake 380 Zone will be connected to the 366 Zone through the construction of approximately 4,000 linear feet of 12-inch ductile iron water main.

Estimated Project Cost: $8,500,000

PRV STATION (P)

P-1: PRV STATION UPGRADES (6-YEAR)

Estimated Project Cost: $900,000

The District has an ongoing PRV replacement and maintenance program. Three PRV stations will be rebuilt each year for approximately 150,000 annually. Improvements at each station may include one or more of the following: new vault and piping, vault relocation, painting, hatch lid, drain repairs, pipe supports, and ladder improvements.

SEISMIC UPGRADE PROGRAM (S)

S-1: ACCESS MANWAYS TO INGLEMOOR TRANSMISSION MAIN (20-YEAR)

Estimated Project Cost: $140,000

The Inglemoor transmission main will undergo video inspection to identify the existing condition of the pipe and the best access points for maintenance. The project will install five to seven access manways to the 24-inch transmission main.

S-2: INGLEMOOR RESTRAINED JOINTS IN LIQUEFACTION ZONE (6-YEAR)

Estimated Project Cost: $100,000

The District plans to install restraints on approximately 165 linear feet of the Inglemoor 24-inch concrete cylinder transmission main constructed in 1975 with 24-inch restrained joint ductile iron pipe throughout the seismic hazard area near the crossing of the Sammamish River. This project will strengthen the pipeline through unstable soils along its alignment.

S-3: NORWAY HILL BOOSTER STATION (10-YEAR)

Estimated Project Cost: $425,000

The District plans to upgrade the Norway Hill Booster Station at the end of the existing pump's useful life. The upgraded booster station will be designed to provide maximum day demand to the Inglemoor Tank Farm so that it can be used as an alternate source of supply to the 24-inch Inglemoor Transmission Main. This project also includes the installation of a standby generator and automatic transfer switch.

S-4: 68TH AVENUE NE BRIDGE WATER MAIN REPLACEMENT (6-YEAR)

Estimated Project Cost: $360,000

The City of Kenmore plans to replace a bridge on 68th Avenue NE that crosses the Sammamish River. The bridge will be replaced with one that is up to seismic code. This project will replace approximately 800 linear feet of the existing 12-inch ductile iron water main attached to the existing bridge crossing of the Sammamish River that serves the 342 Zone. A new 12-inch ductile iron main will be hung under the new bridge.

S-5: SAMMAMISH RIVER CROSSING REPLACEMENT WATER MAINS (10-YEAR)

Estimated Project Cost: $500,000

For Part 1 of this project, the District plans to directionally drill a 10-inch OD HDPE water main beneath the Sammamish River at 84th Avenue NE. This project will replace the existing 12-inch ductile iron water main attached to a bridge crossing of the Sammamish River that serves the 342 Zone.

For Part 2 of this project, the District plans to bore a 10-inch OD HDPE water main beneath the Sammamish River at 91st Avenue NE. This project will replace 450 linear

feet of existing 8-inch ductile iron attached to a bridge crossing of the Sammamish River that serves the 342 Zone.

S-6: INGLEMOOR TRANSMISSION MAIN REPLACEMENT (BEYOND 20-YEAR CIP)

Estimated Project Cost: $6,400,000

The District plans to replace the Inglemoor Transmission Main between the Tolt connection and the Inglemoor Tank Farm. The existing pipeline is estimated to have approximately 35 to 45 years of remaining useful life. The transmission main will likely follow the alignment of the existing pipeline.

REPAIR AND REPLACEMENT PROJECTS (R)

The District has identified a number of water main replacement projects based on the Asset Management Program. Criteria used to identify projects are a probability of failure greater than 90 percent or a risk factor of 14 or greater. Table 10-1 presents the District's repair and replacement program for the 10-year planning period in no specific order. The District also plans to budget $100,000 per year for discretionary water main repair and replacement projects that have not yet been identified. All costs estimates assume that the projects are constructed in public right-of-way and include engineering and construction administration. A map of the replacement projects is included in Appendix M.

TABLE 10-1

Water Main Replacement Program

No.	Project Name/Location	Replacement Material/Age	Length (feet)	Cost
R-1	112/Champagne Point Water Main Replacement	8" AC – 1975	2,717	$ 338,000
R-2	117/84 Water Main Replacement	12" AC – 1974; 6" PVC C200 – 1977	1,089	$ 262,000
R-3	118/90 Water Main Replacement	1" Poly	233	$ 8,000
R-4	120/94 Water Main Replacement	8" Cast Iron – 1969	54	$ 13,000
R-5	124/84Water Main Replacement	12" AC – 1974	113	$ 42,000
R-6	Water Main Replacement	6" PVC C200 – 1973	1,306	$ 228,000
R-7	132/86 Water Main Replacement	4"–8" Cast Iron – 1964; 12" PVC C200 – 1978	3,088	$ 629,000
R-8	134/108 Water Main Replacement	8" AC – 1960	373	$ 94,000
R-9	135/93 Water Main Replacement	4"–8" Cast Iron – 1968	1,341	$ 288,000
R-10	135/HPD Water Main Replacement	8" AC – 1975; 2"–8" PVC C200 – 1976	6,376	$ 1,467,000
R-11	136/89 Water Main Replacement	8" AC – 1973; 3" PVC C200 – 1973	646	$ 80,000
R-12	139/90 Water Main Replacement	6" Cast Iron – 1966	269	$ 47,000
R-13	140/116 Water Main Replacement	6"–10" Cast Iron – 1960	1,328	$ 301,000

TABLE 10-1 – (continued)

Water Main Replacement Program

No.	Project Name/Location	Replacement Material/Age	Length (feet)	Cost
R-14	140/121 Water Main Replacement	8" Cast Iron – 1967	233	$ 54,000
R-15	140/84 Water Main Replacement	8" Cast Iron – 1963	1,005	$ 232,000
R-16	141/83 Water Main Replacement	4" Cast Iron – 1960	131	$ 16,000
R-17	141/95 Water Main Replacement	2"–8" PVC C200 – 1976	1,101	$ 174,000
R-18	143/83 Water Main Replacement	6" Cast Iron – 1960	835	$ 147,000
R-19	144/88 Water Main Replacement	8"–12" PVC C200 – 1977	1,476	$ 421,000
R-20	145/100 Water Main Replacement	8" AC – 1960	3,107	$ 773,000
R-21	146/106 Water Main Replacement	1"–8" PVC C200 – 1975	1,107	$ 223,000
R-22	150/106 Water Main Replacement	2" PVC C200 – 1976	604	$ 35,000
R-23	155/Juanita Water Main Replacement	8" Cast Iron – 1960	754	$ 174,000
R-24	164/112 Water Main Replacement	6" Cast Iron – 1964	1,288	$ 223,000
R-25	175/73 Water Main Replacement	8" – 1960	45	$ 11,000
R-26	181/60 Water Main Replacement	8" AC – 1974	853	$ 214,000
R-27	182/66 Water Main Replacement	8" AC – 1960	2,191	$ 505,000
R-28	187/64 Water Main Replacement	Varies	3,017	$ 641,000
R-29	190/61 Water Main Replacement	1" Poly	276	$ 8,000
R-30	197/58 Water Main Replacement	Varies	809	$ 146,000
R-31	200/55 Water Main Replacement	4"–6" Cast Iron – 1960	663	$ 113,000
R-32	Juanita Safeway Water Main Replacement	10" Cast Iron – 1960	381	$ 110,000
R-33	Juanita/138 Water Main Replacement	8" AC – 1960	95	$ 24,000
R-34	Kenmore Lanes Water Main Replacement	8" Cast Iron – 1958	369	$ 86,000
R-35	Kingsgate Water Main Replacement	4"–10" Cast Iron – 1964	10,630	$ 1,981,000
R-36	Kirkland Fire Station 27 Water Main Replacement	6" AC – 1960	160	$ 31,000
R-37	Private Fire Line	Unknown	237	$ 28,000
R-38	Simonds/92 Water Main Replacement	8" AC – 1960	58	$ 15,000
R-39	Uplake Dental Water Main Replacement	8" PVC C200 – 1975	336	$ 78,000
Total Cost				**$10,260,000**

The hydraulic analysis in Chapter 6 identified several deficiencies in fire flow. Many of the deficiencies are the result of municipal annexations where the fire flow requirement was increased from 1,000 gpm for King County regulations to 1,500 gpm under the new municipal regulations. Most of the deficiencies occur on dead-end hydrant waterlines that are 6 inches or smaller. The District may elect to upgrade these waterlines to 8 inches as part of other projects or as separate projects. Some of the hydrant deficiencies can also be addressed by adjusting the hydraulic grade of the zone.

TABLE 10-2

Hydrant Fire Flow Upgrade Program

No.	Name/Location	Upgrade
R-40	NE 140th Street and 98th Avenue NE	8-inch to hydrant
R-41	86th Avenue NE north of NE 190th Street	8-inch to hydrant
R-42	89th Avenue NE north of NE 192nd Place	8-inch to hydrant
R-43	NE 154th Street and 61st Place NE	Adjust HGL up by 15 psi
R-44	61st Place NE and NE 152nd Street	
R-45	NE 152nd Street and 62nd Avenue NE	
R-46	NE 194th Street east of 37th Avenue NE	8-inch to hydrant
R-47	NE 141st Way and 125th Avenue NE	8-inch to hydrant
R-48	NE 151st Street last hydrant	Adjust HGL up by 5 psi
R-49	NE 200th Place west of 55th Avenue NE	8-inch to hydrant
R-50	NE 196th Court east of 40th Place NE	8-inch to hydrant
R-51	NE 139th Street west of 70th Avenue NE	8-inch to hydrant
R-52	NE 139th Street and 71st Place NE	8-inch to hydrant

SUMMARY

Table 10-3 provides a summary of the capital improvement plan project costs. All costs are shown in year 2015 dollars. The 6-year CIP cost is $4,500,000 and the 10-year CIP cost is $13,444,000.

TABLE 10-3

Capital Improvement Plan Summary[(1)]

CIP Number	Project Description	Project Cost[(1)]		
		6-year	10-year	20-year
M-1	Easement Issues	$ 25,000		
M-2	RWA Source Development			$ 300,000
M-3	Lake Forest Park Reservoir and Pump House Improvements	$ 500,000		
M-4	Water System Plan Extension	$ 20,000		
M-5	Leak Detection	$ 30,000	$ 50,000	$ 100,000
M-6	Norway Hill Reservoir Interior Recoating and Seal Welding	$1,270,000		
M-7	Inglemoor Standpipe Exterior and Interior Recoating	$1,020,000		
M-8	Inglemoor Reservoir 3 Exterior Recoating		$ 620,000	
M-9	Westhill Reservoir Interior Recoating		$ 330,000	
M-10	Kingsgate Reservoir Interior Recoating		$ 485,000	
M-11	Headquarters Skylight and Coatings	$ 275,000		
M-12	112th PRV and Hydroturbine Project		$1,254,000	
M-13	366 Zone Water Main		$ 520,000	
M-14	104th Street Master Meter 4 Upgrades		$ 130,000	
M-15	Water System Plan		$ 100,000	
M-16	St. Edwards Water Main Loop		$ 530,000	
M-17	366 Zone Reservoir and Booster Station		$8,500,000	
P-1	PRV Station Upgrades	$ 900,000		
S-1	Access Manways to Inglemoor Transmission Main			$ 140,000
S-2	Inglemoor Restrained Joints in Liquefaction Zone	$ 100,000		
S-3	Norway Hill Booster Station		$ 425,000	
S-4	68th Avenue NE Bridge Water Main Replacement	$ 360,000		
S-5	Sammamish River Crossing Replacement Water Mains		$ 500,000	
S-6	Inglemoor Transmission Main Replacement			$6,400,000
Total Cost		**$4,500,000**	**$13,444,000**	**$6,940,000**

(1) Shown in 2015 dollars.