

8. IMPROVEMENT PROGRAM

8.1 Introduction

This chapter develops capital improvement plans (CIPs) for the 6- and 20-year planning horizons to address the system needs and deficiencies identified in the previous chapters of this WSP. The improvements have been prioritized to provide the necessary capacity according to the schedules described in Chapters 3 and 4. In addition to capital improvements, this chapter also presents O&M improvements and non-facility projects that the City will undertake to improve the performance and reliability of the water system.

As documented throughout this WSP, two different development scenarios have been evaluated: with and without the development of the MPCs. The City has elected to plan improvements to the water system according to the “without MPCs” scenario due to uncertainties as to when the MPCs will begin to develop. This chapter describes a schedule of improvements and individual projects in detail for the “without MPCs” scenario. The “with MPCs” scenario would entail many of the same projects, only on an accelerated schedule and with additional projects being required in the later years of the 20-year planning horizon. A schedule of improvements for the “with MPCs” scenario is presented for reference, but it will need to be reevaluated and updated at such time that it is determined that the MPCs are ready to begin development.

8.2 Project Prioritization

The need for the capital projects that make up the CIPs is described in Chapters 3 and 4. The primary consideration in prioritizing projects was to ensure that sufficient capacity is available in the system such that projected growth rates are accommodated, consistent with Growth Management Act mandates and Thurston County projections. Furthermore, the implementation of capital projects needs to take into account plans for the acquisition of additional water rights by the City. The CIPs have been prepared in accordance with the schedule shown in the Water Rights Mitigation Plan for new water rights being approved and transfers being completed (see Table 1-2 in Appendix 4E). For example, the Mitigation Plan shows a Phase 1 water right of 554 acre-feet being approved between 2010 and 2012. The 6-year CIP includes the development of Southwest Yelm Well 1A, which would withdraw water under this water right, being completed and put into service in 2012.

In addition to being developed to ensure that there is sufficient capacity available, the CIPs have been developed to improve the reliability and flexibility of the system. The existing sources, Wells 1A and 2, are very close to each other in downtown Yelm. If a hazardous material spill impacts one well, it would likely also impact the other. Development of the wells in the southwest Yelm wellfield will provide a much greater level of reliability and flexibility.

Construction of the new reservoirs will provide more flexibility for operation of the system while a reservoir is offline for maintenance. In addition, the reservoir to be constructed in southeast Yelm was sited to improve fire flow conditions in that area of the system.

Distribution system improvements were prioritized to address the most severe deficiencies first. Projects D-1, D-2, and D-3 (see Section 8.3.5) were selected to be constructed between 2010 and 2014 to improve fire flows in downtown Yelm around City Hall.

Non-facility and O&M projects were prioritized to address issues that were identified during the development of the CIPs. For example, as new sources are developed and put into service, the existing WHPP will need to be updated or an entirely new plan will need to be prepared. As the existing water system facilities were evaluated, it was determined that a computerized O&M system would allow system operators to track maintenance tasks, inventories, and operating records more efficiently. Consequently, the implementation of a maintenance system has been budgeted at a cost of \$25,000 per year for 4 years.

8.3 Project Descriptions

This section provides details about the individual projects that make up the 6- and 20-year CIPs. Figure 8-1 shows the location of the improvements. The schedules and cost estimates for the CIPs are summarized in Section 8.5.

8.3.1 Water Rights Mitigation

The Water Rights Mitigation Plan (Appendix 4E) presents a program of mitigation efforts that have been proposed to offset impacts to water bodies that are affected by the City's pumping of water associated with new and transferred water rights. Mitigation efforts will potentially include the acquisition of consumptive water rights, habitat restoration projects, and the future retirement of the downtown wells. Annual project costs of \$580,000 and \$290,000 have been allocated in the CIPs for 2010 and 2011 to pay for these mitigation efforts; after 2011, \$100,000 is allocated per year.

8.3.2 Sources

Preliminary locations of the southwest Yelm wells were identified in the Mitigation Plan (see Figure 8-2). Development of the CIPs assumed that the first three wells in the CIPs would be at the sites labeled "SW Yelm Pref," "SW Yelm Option 2," and "SW Yelm No. 3" as shown on Figure 8-2, and that these three wells would be connected to a single water treatment system and reservoir, as described below. Each well has been assumed to have a pumping capacity of 750 gpm in the water rights mitigation planning efforts. If the wells show that a greater production than 750 gpm can be reliably and safely achieved, alternative locations in the same general vicinity would be investigated.

The planning-level cost estimate prepared for the wells planned for the southwest Yelm wellfield is presented in Table 8-1. The estimated cost was checked against two data points: (1) Golder and Associates prepared a technical memorandum estimating the cost for planning, drilling, and gaining approval for a well in southwest Yelm to be approximately \$360,000; and (2) a well recently constructed in Quincy, Washington, with a similar capacity and depth had a construction cost of \$380,000. The cost estimate in Table 8-1 shows a similar cost for the well itself (\$412,000) and also includes costs for the pump, well house, etc. A contingency factor of 25 percent is used for planning purposes, and the estimated construction cost is estimated to be \$1,159,000. The estimated project cost, including administration, engineering, and construction management is then estimated to be \$1,530,000.

Note: Cost estimates assume that land for the wells and other facilities in southwest Yelm will be provided under a covenant or some other instrument with the landowner at a minimal cost to the City.

Figure 8-1
City of Yelm 6- and 20- Year
Capital Improvement Plans
without MPCs Scenario

Legend

- City of Yelm
- Urban Growth Area
- Existing Water System
- Existing Tanks
- Existing Active Well

Well	W-	6 Year CIP	20 Year CIP
Treatment System	WTS-		
Reservoir	RES-		
Transmission/ Distribution Piping	T- / D-		

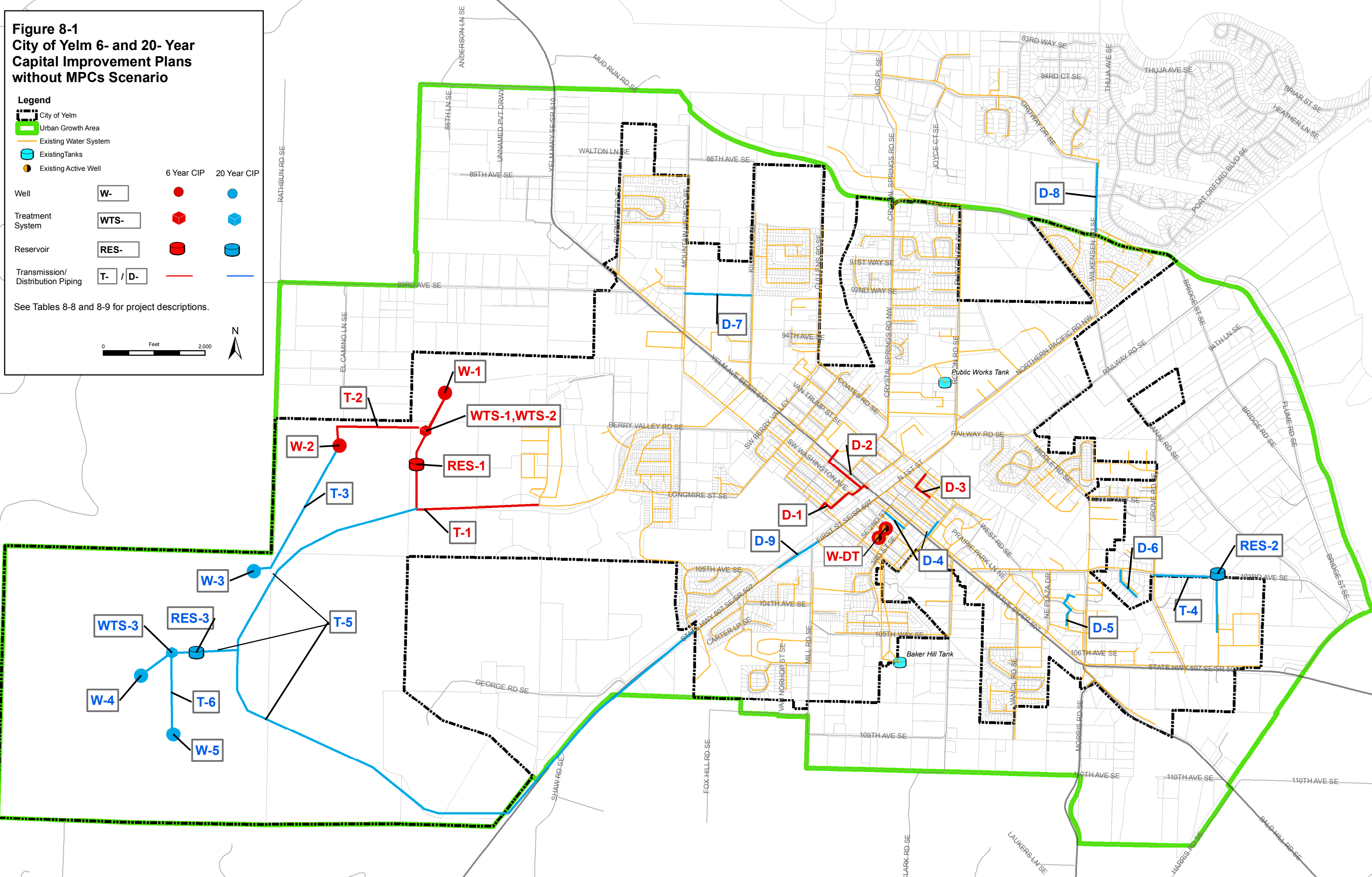
See Tables 8-8 and 8-9 for project descriptions.

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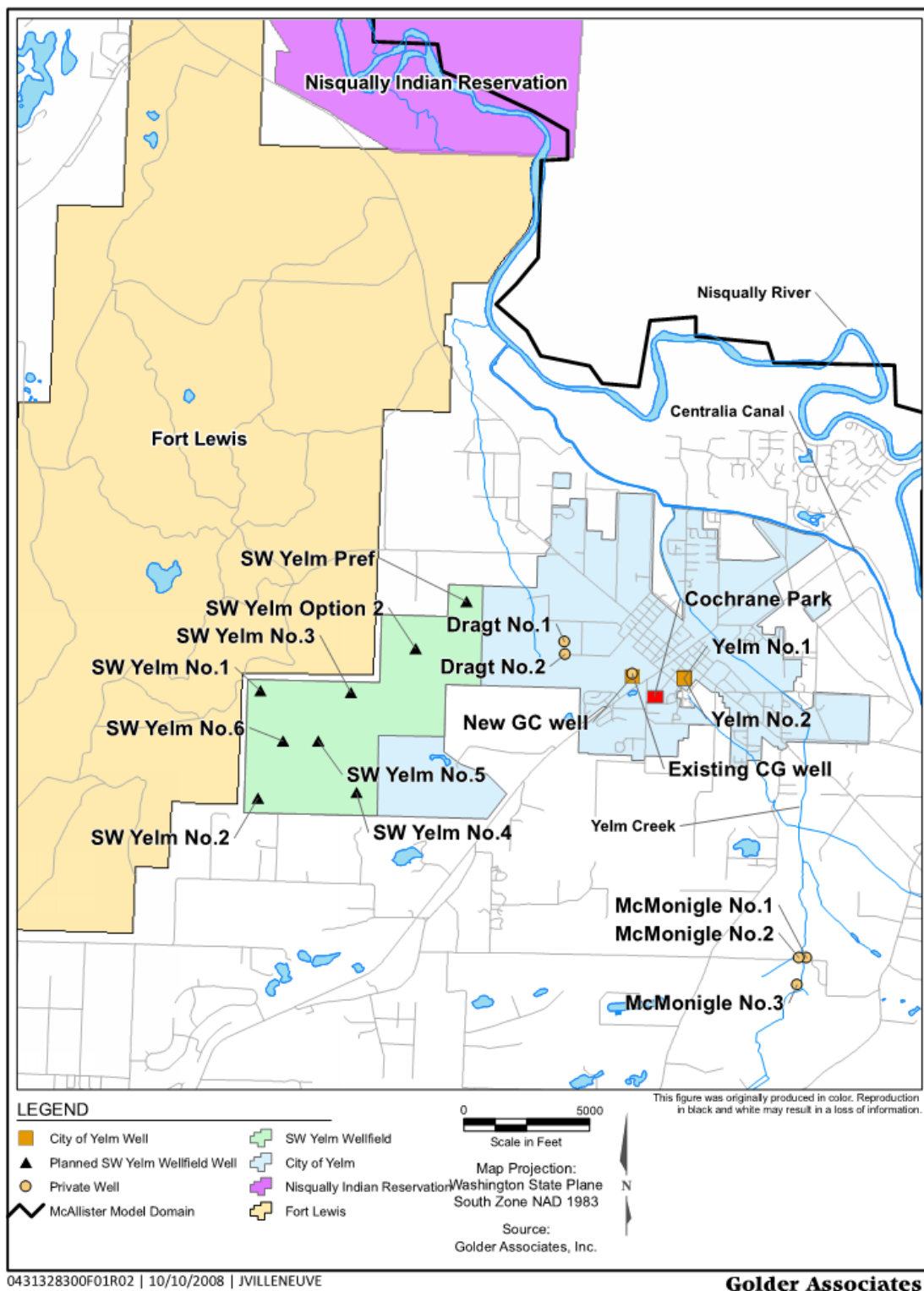


Figure 8-2. Preliminary Locations of Southwest Yelm Wells

Table 8-1. Typical Southwest Yelm Well Construction Cost Estimate

Facility	Factor		Estimated Cost
Well			\$412,000
Pump			\$52,000
Well house			\$103,000
Site development			\$103,000
Electrical (including service to site)			\$206,000
I&C			\$52,000
Subtotal (includes sales tax)			\$927,000
Contingency	25%	of Subtotal	\$232,000
		Estimated Construction Cost	\$1,159,000
Permitting	5%	of estimated construction cost	\$58,000
Design	12%	of estimated construction cost	\$139,000
Bidding/construction services	10%	of estimated construction cost	\$116,000
City admin./legal/funding	5%	of estimated construction cost	\$58,000
		Estimated Project Cost	\$1,530,000

In addition to developing new sources, the City is planning to complete improvements at the Downtown Wells to increase the source capacity from 1,200 gpm to 1,700 gpm. The cost estimate for this project was prepared during a preliminary report completed in 2010 by Parametrix, and estimates a cost of approximately \$1,000,000. The anticipated completion date for this project is 2011.

8.3.3 Water Treatment

Water treatment for the new sources will include disinfection at a minimum. Since corrosion control is required for the downtown wells, it is assumed that corrosion control will also be required for the new wells. For the purposes of estimating project costs it was assumed that both disinfection (using gaseous chlorine in cylinders) and corrosion control (using sodium hydroxide) will be the same as at the downtown wells.

The one water quality sample that was taken from the southwest Yelm wellfield at the location “SW Yelm No. 1” in Figure 8-2 showed the manganese concentration to be about twice the secondary maximum contaminant limit (SMCL) (0.106 mg/L measured vs. a limit of 0.05 mg/L). Manganese concentrations from other wells in the area were typically substantially lower than the SMCL. It is expected that over time the manganese concentration in water from wells in the southwest Yelm wellfield will decrease as the well is operated to withdraw water from different aquifer layers (personal communication with Golder and Associates, August 2008). Appendix 8A provides water quality data for a number of wells in the area. (Note: These data are provided to show previous sampling work and should not be taken as the results of a rigorous sampling and testing program.)

The water quality data that is available is not enough to indicate that a treatment system for manganese will be required. Consequently, cost estimates do not include costs for treatment system disinfection and corrosion control.

The planning level cost estimate prepared for the treatment systems on the southwest Yelm wellfield is presented in Table 8-2. The estimated construction cost for the initial treatment system (project WTS-1) is \$966,000 with a project cost of \$1,300,000.

Table 8-2. Water Treatment System Construction Cost Estimate			
Facility	Factor		Estimated Cost
Treatment building separate from pump house			\$361,000
Chlorine gas disinfection system			\$155,000
Caustic soda system			\$103,000
SCADA system/security			\$52,000
Emergency generator			\$103,000
Subtotal (includes sales tax)			\$773,000
Contingency	25%	of Subtotal	\$193,000
		Est. Construction Cost	\$966,000
Permitting	3%	of est. const. cost	\$29,000
Design	15%	of est. const. cost	\$145,000
Bidding/construction services	12%	of est. const. cost	\$116,000
City admin./legal/funding	5%	of est. const. cost	\$48,000
		Est. Project Cost	\$1,300,000

Additional treatment system projects will include the expansion of WTS-1 when Southwest Yelm Wells 2 and 3 are constructed (WTS-2). A second treatment system (project WTS-3) will need to be built when Southwest Yelm Wells 4 and 5 are developed.

8.3.4 Reservoirs

The schedule for construction of the new reservoirs is described in Section 3.3.3. Completion of Southwest Yelm Reservoir 1 in 2012 will coincide with the completion of Southwest Yelm Well 1A and will provide adequate capacity through the remainder of the 6-year planning horizon. A second reservoir in southeast Yelm is planned for construction by 2021. In addition to providing additional storage capacity needed to accommodate forecasted demands, this reservoir will also help to address fire flow deficiencies in the vicinity.

A third reservoir (Southwest Yelm Reservoir 2) is scheduled for completion three years after the Southeast Yelm Reservoir comes online. Southwest Yelm Reservoir 2 was scheduled at this point in the 20-year CIP to be constructed in conjunction with Southwest Yelm Well 4. Depending on where this well is ultimately located and how it is constructed, construction of the third reservoir may be able to be delayed.

Chapter 3 describes the construction of new reservoirs in southwest Yelm to create a new pressure zone at an elevation of 630 feet. This elevation was selected to ensure that even the highest points in the service area could be provided with adequate pressure. Depending on the expected timing of the development of the MPCs, it may be more economical to build the reservoir at a lower elevation that would still provide adequate pressure to the areas in the majority of the retail service area and areas of the MPCs that would be expected to be developed first. For example, a reservoir with an elevation of 570 feet would provide adequate pressure to areas as high as approximately 410 feet in elevation, which encompasses the Phase 1 area of the Thurston Highlands MPC, as documented in the Thurston Highlands EIS, as well as the remainder of the service area.

The optimal operating elevation for the first southwest Yelm reservoir will be evaluated during the initial design of the southwest Yelm wellfield improvements.

The relative costs of elevated tanks and standpipe-type tanks will also be evaluated during detailed planning and design of these reservoirs. Cost estimates for the new reservoirs to be built were based on the construction cost for the existing Public Works tank. This elevated steel tank with a volume of 500,000 gallons had a construction cost of \$1.2 million in 2004. The planning-level cost estimate used for the reservoirs is presented in Table 8-3.

Table 8-3. 500,000 Gallon Reservoir Construction Cost Estimate			
	Length ¹	Unit Cost ²	Cost
Reservoir			\$1,360,000
Site development			\$103,000
Subtotal (includes sales tax)			\$1,463,000
Contingency	25%	of Subtotal	\$366,000
		Estimated Construction Cost	\$1,828,000
Permitting	3%	of est. const. cost	\$55,000
Design	15%	of est. const. cost	\$274,000
Bidding/construction services	10%	of est. const. cost	\$183,000
City admin./legal/funding	5%	of est. const. cost	\$91,000
		Estimated Project Cost	\$2,430,000

¹ Public Works Tank cost \$1.2 million in 2004; cost has been inflated to 2009 using the ENR index.

8.3.5 Distribution System

The hydraulic capacity analysis presented in Section 3.3.4.4 identified deficiencies in the existing distribution system where adequate fire flows cannot be achieved. A number of pipeline construction and replacement projects have been included in the CIP to address these deficiencies. A budget of \$100,000 per year has been allocated to these projects; the CIPs show a \$200,000 project being completed approximately every two years to address these deficiencies.

In addition to the pipeline projects, the existing distribution system deficiencies will also be addressed, in part, by the reservoir projects that have been identified. In particular, the Southeast Yelm Reservoir (project RES-2) will help to address fire flow issues in the southeast part of the system.

Cost estimates for the distribution system projects were developed using construction costs for similar types of projects in the cities of Edmonds and Lynnwood. The individual distribution system CIP projects are described in Table 8-4. Figures 8-4, 8-5, and 8-6 provide additional details for the first three projects that make up the 6-year CIP. The cost estimates shown in these figures average about \$200,000 each and the costs shown in the CIP reflect this average cost. Depending on the availability of funds, it may be necessary to reconfigure these projects so that some of the scope of project D-1 (with an estimated project cost of \$314,000) can be transferred to projects D-2 and D-3.

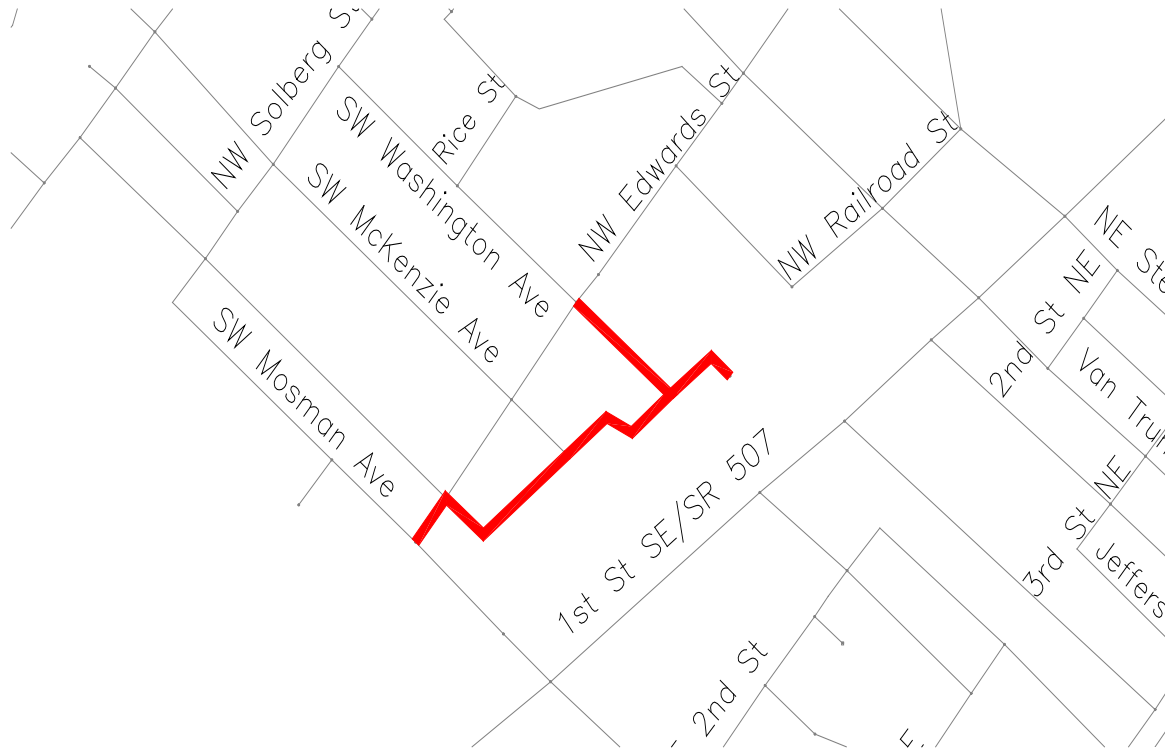
Table 8-4. Distribution System Projects

Cap. Project ID No.	On Street	From Street	To Street	Existing Pipe	New Pipe Size	Length (feet)	Unit Cost	Year Constructed	Estimated Project Cost ¹
D-1	Railroad St. SW	Yelm City Hall	Mosman	3" to 4" AC	10	1,210	\$200	2010	\$242,000
D-1	SW Washington Ave.	Railroad St. SW	Edwards St. NW	4" AC	10	360	\$200		\$72,000
					Total	1,570		Project D-1	\$314,000
D-2	SW Washington Ave.	Edwards St. NW	Rice St. SW	4" AC	10	450	\$212	2012	\$95,400
D-2	Rice St. SW	SW Washington Ave.	Yelm Ave. W	4" AC	10	280	\$212		\$59,360
					Total	730		Project D-2	\$154,760
D-3	Van Trump Ave. NE	2nd St. NE	3rd St. NE	4" AC	10	360	\$225	2014	\$81,000
D-3	2nd St. NE	NE Stevens Ave.	Van Trump Ave. NE	4" AC	10	320	\$225		\$72,000
					Total	680		Project D-3	\$153,000
D-4	3rd St. SE	Washington Ave. SE	Yelm Ave. E	4" AC	8	325	\$239	2016	\$77,675
D-4	Washington Ave. SE	76th Ave. W	W cul-de-sac	4" AC	8	475	\$239		\$113,525
					Total	800		Project D-4	\$191,200
D-5	Algiers Ct. NE	Algiers Dr.	170' north	4" AC	8	170	\$228	2018	\$38,760
D-5	Algiers Ct. NE	North End	130' east to connect	N/A	8	130	\$228		\$29,640
D-5	Algiers Dr.	Algiers Ct. NE	Yelm View Ct NE	6" AC	8	200	\$228		\$45,600
D-5	Yelm View Ct. NE	Algiers Dr.	350' south	4" AC	8	350	\$228		\$79,800
					Total	850		Project D-5	\$193,800
D-6	Tranquility Ln.	103rd Ave. SE	650' south to cul-de-sac	4" AC	8	650	\$255	2020	\$165,750
D-7	Sprague St.	Mountain View Rd. SE	Killion Rd. SE	N/A	10	1,240	\$316	2022	\$391,840
D-8	SR 507	Mill Rd. SE	910' southwest	N/A	10	910	\$285	2024	\$259,350
D-9	Wilkensen Rd. SE	Ordway Dr.	1,210' south to connect	N/A	8	1,210	\$255	2028	\$308,550

¹ A budget of \$100,000 per year, or \$200,000 every 2 years, is allocated to the distribution system projects. Scope of individual projects may be adjusted during planning and design to match construction costs to funds available.

PROJECT NAME: City Hall Water Loop
Waterline Replacement

ESTIMATED PROJECT COST: \$314,000



PROJECT BENEFIT/ RATIONALE: To provide improved fire flow and domestic service.

SCHEDULE: 2010

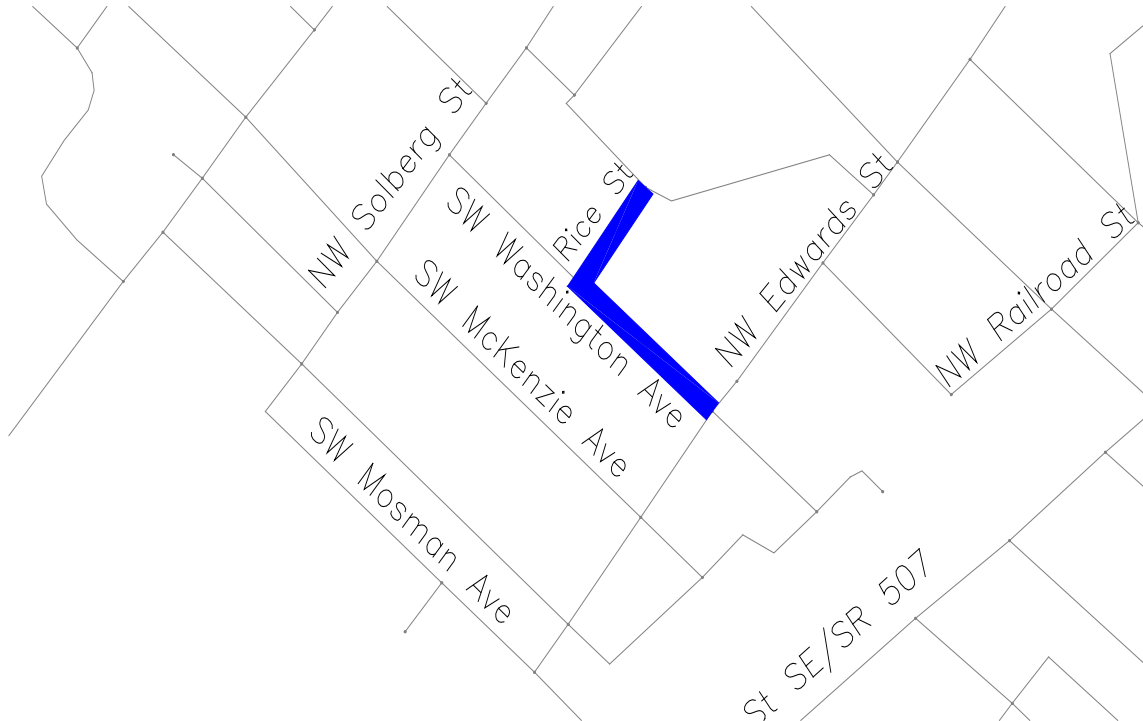
COST BREAKDOWN

PROJECT COST	2009	2010	2011	2012	2013	2014
Planning/Study Engineering & Admin		\$60,000				
Construction		\$254,000				
TOTAL		\$314,000				

Figure 8-4. CIP Project D-1: City Hall Loop Waterline Replacement

CIP Project D-2: SW Washington Waterline Replacement

PROJECT NAME: SW Washington Waterline Replacement	ESTIMATED PROJECT COST: \$154,760
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PROJECT DESCRIPTION: Replace the following lines with 10" PVC water main and hydrants and associated appurtenances: (1) Existing 4" diameter Asbestos Cement (AC) main on SW Washington Avenue between Edwards St. NW and Rice St. SW; (2) Existing 4" diameter AC main on Rice St. SW between SW Washington Ave. and Yelm Ave. W.

PROJECT BENEFIT/ RATIONALE: To provide improved fire flow and domestic service.

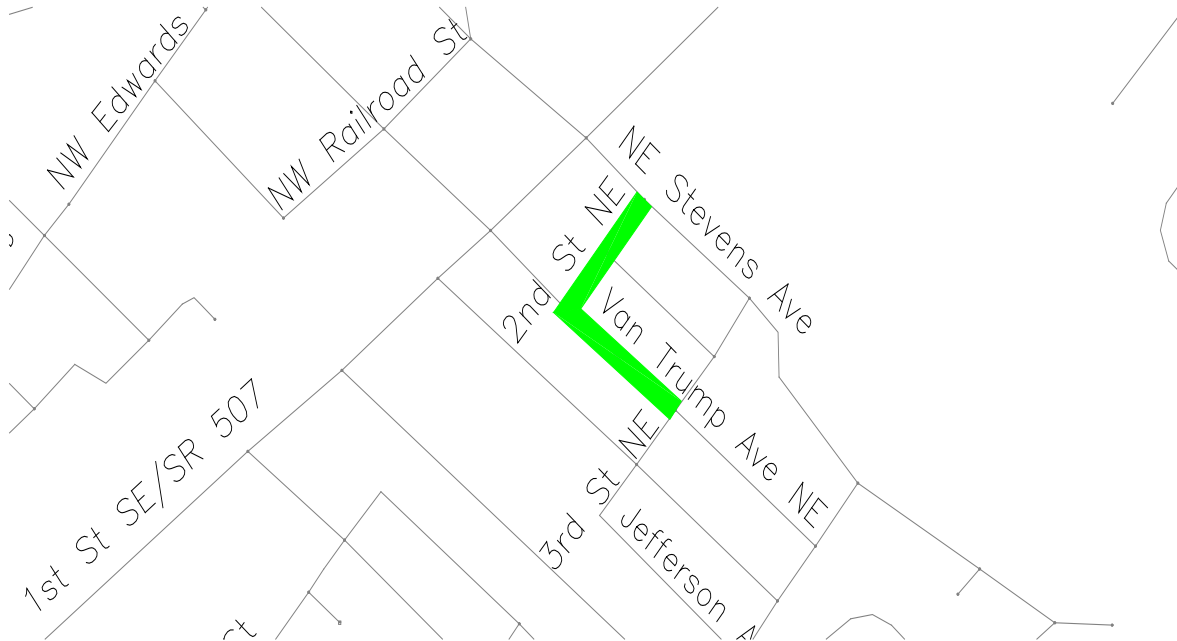
SCHEDULE: 2012

COST BREAKDOWN						
PROJECT COST	2009	2010	2011	2012	2013	2014
Planning/Study Engineering & Admin.				\$30,000		
Construction				\$124,760		
TOTAL				\$154,760		

Figure 8-5. CIP Project D-2: SW Washington Waterline Replacement

CIP Project D-3: Van Trump Ave. NE Waterline Replacement

PROJECT NAME: Van Trump Ave. NE Waterline Replacement	ESTIMATED PROJECT COST: \$153,000
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PROJECT DESCRIPTION: Replace the following lines with 10" PVC water main and hydrants and associated appurtenances: (1) Existing 4" diameter Asbestos Cement (AC) main on Van Trump Ave. NE between 2nd St. NE and 3rd St. NE; (2) Existing 4" diameter AC main on 2nd St. NE between NE Stevens Ave. and Van Trump Ave. NE.

PROJECT BENEFIT/ RATIONALE: To provide improved fire flow and domestic service.

SCHEDULE: 2014

COST BREAKDOWN						
PROJECT COST	2009	2010	2011	2012	2013	2014
Planning/Study Engineering & Admin.						\$30,000
Construction						\$123,000
TOTAL						\$153,000

Figure 8-6. CIP Project D-3: Van Trump Ave. NE Waterline Replacement

8.3.6 Transmission System

Transmission main CIP projects are those that will construct the interconnecting pipelines between the facilities in the southwest Yelm wellfield and then connect the wellfield to the existing distribution system. The pipelines will be constructed primarily in undeveloped areas where conflicts with existing utilities and restoration requirements will be minimal. Where restoration requirements will be more substantial, the cost estimates have been increased accordingly. For example, project T-5 includes the construction of a 12-inch pipeline along SR 507 and the unit cost for that portion of the project has been increased from \$125 per foot to \$144 per foot to allow for restoration costs in the public right-of-way.

Cost estimates for the transmission mains are based on an assumed pipe diameter of 16 inches. This is a conservative assumption; modeling of the system showed that 12-inch transmission mains would provide sufficient capacity for the forecasted demands. Pipe sizing will need to be confirmed during design of the improvements.

Cost estimates for typical pipeline projects are shown in Tables 8-5 and 8-6. Costs shown in the CIP for pipelines other than those for which a cost estimate is shown were estimated assuming that the cost would be directly proportional to the length.

Table 8-5. Transmission Main 1 Construction Cost Estimate

	Length ¹	Unit Cost ²	Cost
16" from well to connection at existing main at Tahoma Terra	1,575	LF @ \$125/LF	\$197,000
Subtotal (includes sales tax)			\$197,000
		Estimated Construction Cost	\$197,000
Permitting	3%	of estimated construction cost	\$6,000
Design	12%	of estimated construction cost	\$24,000
Bidding/construction services	8%	of estimated construction cost	\$16,000
City admin./legal/funding	4%	of estimated construction cost	\$8,000
		Estimated Project Cost	\$250,000

¹ Lengths are approximate; calculations are not exact due to rounding.

² Unit cost includes sales tax and 25 percent contingency.

³ Costs are estimated for 16" pipe to be conservative. Pipelines will likely be 12".

Table 8-6. Transmission Main 5 Construction Cost Estimate

	Length ¹	Unit Cost ²	Cost
16" from well to reservoir	2,100	LF @ \$125/LF	\$262,000
16" from reservoir to connection on SR 507	13,400	LF @ \$144/LF	\$1,932,000
Subtotal (includes sales tax)			\$2,194,000
		Estimated Construction Cost	\$2,194,000
Permitting	3%	of estimated construction cost	\$66,000
Design	12%	of estimated construction cost	\$263,000
Bidding/const. services	8%	of estimated construction cost	\$176,000
City admin./legal/funding	4%	of estimated construction cost	\$88,000
		Estimated Project Cost	\$2,790,000

¹ Lengths are approximate; calculations are not exact due to rounding.

² Unit cost includes sales tax and 25 percent contingency.

³ Costs are estimated for 16" pipe to be conservative. Pipelines will likely be 12".

8.4 O&M and Non-Facility Projects

A number of projects and activities have been identified throughout this WSP to improve the reliability of the water system, update plans and programs required by DOH, and implement operational improvements. These projects are summarized in Table 8-7.

Table 8-7. O&M and Non-Facility Projects	
Description	Reference
Review disinfection alternatives to gaseous chlorine	Section 3.3.2
Implement WUE measures including audit of irrigation users	Section 4.1
Prepare WHPP for new sources	Section 5.2
Add a FTE employee to the Public Works staff to be dedicated to O&M of the water system by 2012	Section 6.4
Prepare O&M directions and safety procedures for new facilities as they are constructed and put into service	Section 6.5.2
As new system development occurs, switch parts of system to remote radio meter reading as a system reinvestment project.	Section 6.5.2.3
Implement a computerized inventory tracking and maintenance system over the next 2–3 years to manage spare parts, track maintenance tasks and test results, and generate reports on system performance criteria	Section 6.5.4
Update monitoring plans as the new sources are developed and placed into service	Section 6.6
Prepare a Stage 2 DPBR compliance monitoring plan and perform Stage 2 monitoring by October 2013	Section 6.6.3

8.5 Capital Improvement Plans

The 6- and 20-year CIPs for the “without MPCs” scenario are presented in the following Tables 8-8 and 8-9. The map showing the location of these projects is presented above in Figure 8-1. The estimated project cost for the 6-year CIP (in 2009 dollars) is \$10.8 million. This CIP covers projects scheduled for completion between 2009 and 2015. Table 8-8 shows the CIP for the period from 2016 to 2029 for the remainder of the 20-year CIP. The total estimated cost for these projects is \$19.7 million. For the entire 20-year planning period, the CIP for the Yelm water system represents a total capital investment of \$30.5 million.

A map of the projects that have been identified for the CIP for the “with MPCs” scenario is presented in Figure 8-7. These projects include all of the projects that make up the CIP for the “without MPCs” scenario and include additional projects that would be necessary to provide the necessary capacity in the later years of the 20-year planning horizon. Additional projects include the construction of two additional wells in the southwest Yelm wellfield (projects W-6 and W-7), an additional water treatment system (WTS-4), an additional reservoir with a capacity of 1 million gallons (RES-4), and additional transmission main projects. As part of the CIP for this scenario, the capacity of Southwest Yelm Reservoir 2 would be increased from 500,000 gallons for the “without MPCs” scenario to 750,000 gallons.

The CIP schedule for the “with MPCs” scenario is presented in Tables 8-10 and 8-11. The total estimated project cost of the CIP for this scenario is \$40.0 million.

The 6-year and 20-year CIPs for the “without MPC” scenario are the basis for the capital funding plan presented in Section 9.3. The capital funding plan was used to develop a series of rate increases that were adopted by the City in February, 2009. Following the adoption of the rate increase, the water system CIP was revised to include the Downtown Well project, increased funding for water rights mitigation, and some other smaller changes to individual projects. The net effect of these changes was that the total value of the 6-year CIP increased from the \$9.41 million used in the financial plan to \$10.76 million. Table 8-12 presents a comparison of the CIP described in this chapter and the CIP that is the basis for the capital funding plan.

Table 8-8
City of Yelm Water System
6-Year Capital Improvement Plan (without MPCs)

Project #	Name	Description	Estimated Project Cost	Year On-Line	2010	2011	2012	2013	2014	2015
			(2009 dollars)							
MIT	Mitigation Projects	Projects identified as part of Mitigation Plan, including potentially monitoring, purchase of water rights in the Deschutes River basin, and habitat restoration.	\$1,270,000	N/A	\$580,000	\$290,000	\$100,000	\$100,000	\$100,000	\$100,000
SCADA	SCADA	Upgrade system to provide remote monitoring and control.	\$75,000	2010	\$75,000					
D-1	Railroad St Distribution Replacement	Replace 4" and smaller AC pipe with 10" PVC on Railroad St and SW Washington Ave. Portions of project may be moved to 2012, so that project costs do not exceed \$200K every other year.	\$200,000	2011		\$200,000				
W-DT	Downtown Well Improvements	Complete improvements at the downtown wells which would result in increased capacity of 1,700 gpm.	\$1,000,000	2011	\$1,000,000					
W-1	Southwest Yelm Well #1A	First well located in southwest Yelm wellfield. Assumed capacity of this well, and all wells in southwest Yelm, is 750 gpm.	\$1,530,000	2012	\$863,494	\$666,506				
WTS -1	Water Treatment System #1	Located in vicinity of W-1 and RES-1. Water treatment system will provide disinfection and corrosion control. Sized so that system can be expanded to treat water from W-2 and W-3 in the future.	\$1,300,000	2012	\$736,907	\$563,094				
T-1	Transmission Main #1	16-inch pipe to connect W-1, WTS-1, and RES-1 to the point where connection is made with the existing 16-inch line near Tahoma Terra. Final length to be determined.	\$250,000	2012	\$50,000	\$200,000				
RES-1	Southwest Yelm Reservoir #1	Located in vicinity of W-1, will receive water from wells W-1, W-2, and W-3. Volume = 500,000 gallons. Reservoir will operate at a maximum elevation of 630 feet, above the current 477 pressure zone.	\$2,430,000	2012	\$1,379,543	\$1,050,458				
D-2	SW Washington Ave & Rice St Dist. Replacement	Replace 4" and smaller AC pipe with 10" PVC on SW Washington Ave and Rice St. Potentially could include portions of D-1.	\$200,000	2012			\$200,000			
D-3	Van Trump Distribution Replacement	Replace 4" and smaller AC pipe with 10" PVC on Van Trump Ave and 2nd St	\$200,000	2014					\$200,000	
W-2	Southwest Yelm Well #2	Assumed capacity of 750 gpm. Connects to water treatment system via transmission main T-2.	\$1,530,000	2016					\$196,988	\$1,333,013
WTS -2	Expansion of Water Treatment System #1	Expand system built for W-1 to increase capacity when W-2 is constructed and provide future capacity for W-3.	\$429,000	2016					\$57,358	\$371,642
T-2	Transmission Main #2	Connects W-2 to WTS-1. Estimated length = 2,200 feet.	\$348,000	2016					\$41,128	\$306,872
6-Yr CIP Totals			\$10,760,000		\$4,684,944	\$2,970,058	\$300,000	\$100,000	\$595,474	\$2,111,526

Table 8-9
City of Yelm Water System
20-Year Capital Improvement Plan (without MPCs)

Project #	Name	Description	Estimated Project Cost	Year On-Line	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
			(2009 dollars)															
W-3	Southwest Yelm Well #3	Assumed capacity of 750 gpm. Connects to WTS via transmission main TM-3 and well W-2.	\$1,530,000	2018	\$196,988	\$1,333,013												
W-4	Southwest Yelm Well #4	Assumed capacity of 750 gpm. Connected to WTS-3.	\$1,530,000	2024							\$196,988	\$1,333,013						
W-5	Southwest Yelm Well #5	Assumed capacity of 750 gpm. Connected to WTS-3.	\$1,530,000	2030													\$196,988	\$1,333,013
RES-2	Southeast Yelm Reservoir	Located in SE Yelm, in vicinity of Wal-mart. To be on line in 2021, Volume = 500,000 gallons, reservoir will operate in the 477 pressure zone.	\$2,430,000	2021			\$329,085	\$1,050,458	\$1,050,458									
RES-3	Southwest Yelm Reservoir #2	Located in southwest Yelm. Volume = 500,000 gallons. Reservoir will operate in 630 pressure zone.	\$2,430,000	2024						\$329,085	\$1,050,458	\$1,050,458						
WTS -3	Water Treatment System #2	Located in vicinity of W-4 and RES-3. Water treatment system will provide disinfection and corrosion control. Cost estimate increased 50% to allow for potential for further treatment requirements for W-4 and W-5 in future.	\$1,950,000	2024						\$260,719	\$844,641	\$844,641						
T-3	New Transmission Mains #3	Extension of transmission main from W-3 to W-2. Estimated length = 3,600 feet.	\$574,200	2018	\$67,861	\$506,339												
T-4	New Transmission Main #4	Constructed to connect RES-2 to distribution system in southeast Yelm. Estimated length = 2,800 feet.	\$435,000	2021				\$51,410	\$383,590									
T-5	New Transmission Main #5	Approx. 15,500 feet of pipe to connect southwest Yelm loop, including RES-3. Construct as part of W-4 project.	\$2,790,000	2024						\$329,100	\$1,230,450	\$1,230,450						
T-6	New Transmission Mains #6	Extension of transmission main from W-5 to WTS-3. Estimated length = 2,200 feet.	\$348,000	2030													\$41,128	\$306,872
D-4 to D-10	Distribution System Projects	CIP budgets \$100K per year to complete a distribution system replacement projects. See Table 8-4 for projects that have been identified to address existing distribution system deficiencies.	\$100,000/year		\$200,000		\$200,000		\$200,000		\$200,000		\$200,000		\$200,000		\$200,000	
MIT	Mitigation Projects	Projects identified as part of Mitigation Plan, including potentially monitoring, purchase of water rights in the Deschutes River basin, and habitat restoration.	\$100,000/year	N/A	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
	CIP Totals		\$19,747,200		\$764,849	\$1,939,351	\$829,085	\$1,201,867	\$1,934,048	\$1,018,904	\$3,822,535	\$4,558,560	\$500,000	\$100,000	\$500,000	\$100,000	\$738,115	\$1,739,885

Table 8-10
City of Yelm Water System
6-Year Capital Improvement Plan (with MPCs)

Project #	Description		Estimated Cost (2009 dollars)	Year On-Line	2010	2011	2012	2013	2014	2015
MIT	Mitigation Projects	Projects identified as part of mitigation plan. Might include monitoring, purchase of water rights in the Deschutes River basin, possibly reclaimed water projects.	\$1,270,000	N/A	\$580,000	\$290,000	\$100,000	\$100,000	\$100,000	\$100,000
SCADA	SCADA	Upgrade system to provide remote monitoring and control.	\$75,000	2010	\$75,000					
D-1	Railroad St Distribution Replacement	Replace 4" and smaller AC pipe with 10" PVC on Railroad St and SW Washington Ave. Portions of project may be moved to 2012, so that project costs do not exceed \$200K every other year.	\$200,000	2011		\$200,000				
W-DT	Downtown Well Improvements	Complete improvements at the downtown wells which would result in increased capacity of 1,700 gpm.	\$1,000,000	2011	\$1,000,000					
W-1	Southwest Yelm Well #1A	First well located in southwest Yelm wellfield. Assumed capacity of this well, and all wells in southwest Yelm, is 750 gpm.	\$1,530,000	2010	\$1,530,000					
RES-1	Southwest Yelm Reservoir #1	Located in vicinity of W-1, will receive water from wells W-1, W-2, and W-3. Volume = 500,000 gallons. Reservoir will operate at a maximum elevation of 630 feet, above the current 477 pressure zone.	\$2,430,000	2010	\$2,430,000					
WTS-1	Water Treatment System #1	Located in vicinity of W-1 and RES-1. Water treatment system will provide disinfection and corrosion control. Sized so that system can be expanded to treat water from W-2 and W-3 in the future.	\$1,300,000	2010	\$1,300,000					
TM-1	Transmission Main #1	16-inch pipe to connect W-1, WTS-1, and RES-1 to the point where connection is made with the existing 16-inch line near Tahoma Terra. Length to be determined.	\$250,000	2010	\$250,000					
TM-1A	New Transmission Mains #1A	Extend Main #1 as part of MPC development. Approx 4700 ft. Benefit is to MPC for early construction, would eventually be built in the without-MPCs alternative.	\$743,455	2010	\$743,455					
D-2	SW Washington Ave & Rice St Dist. Replacement	Replace 4" and smaller AC pipe with 10" PVC on SW Washington Ave and Rice St. Potentially could include portions of D-1.	\$200,000	2012			\$200,000			
RES-2	Southeast Yelm Reservoir	Located in SE Yelm, in vicinity of Wal-Mart. To be on line in 2013, Volume = 500,000 gallons, reservoir will operate in the 477 pressure zone.	\$2,430,000	2013		\$329,085	\$1,050,458	\$1,050,458		
TM-1B	New Transmission Main #1B	Constructed to connect New Reservoir #2 to distribution system in SE Yelm. Assume cost is 50% of TM-1.	\$435,000	2013			\$51,410	\$383,590		
W-2	Southwest Yelm Well #2	Assumed capacity of 750 gpm. Connects to water treatment system via transmission main T-2.	\$1,530,000	2014				\$196,988	\$1,333,013	
TM-2	New Transmission Mains #2	Connects W-2 to WTS-1. Estimated length = 2,200 feet.	\$348,000	2014				\$52,345	\$295,655	
WTS-2	Expansion of Water Treatment System #1	Expand system built for W-1 to increase capacity when W-2 is constructed and provide future capacity for W-3.	\$429,000	2014				\$57,358	\$371,642	
W-3	Southwest Yelm Well #3	Assumed capacity of 750 gpm. Connects to WTS via transmission main TM-3 and well W-2.	\$1,530,000	2014				\$196,988	\$1,333,013	
TM-3	New Transmission Mains #3	Extension of transmission main from W-3 to W-2. Estimated length = 3,600 feet.	\$574,200	2014				\$22,433	\$551,767	
D-3	Van Trump Distribution Replacement	Replace 4" and smaller AC pipe with 10" PVC on Van Trump Ave and 2nd St	\$200,000	2014					\$200,000	
	CIP Totals		\$16,474,655		\$7,908,455	\$819,085	\$1,401,867	\$2,060,159	\$4,185,089	\$100,000

Table 8-11
City of Yelm Water System
20-Year Capital Improvement Plan (with MPCs)

Project #	Description	Estimated Cost (2009 dollars)	Year On-Line	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
W-4	Southwest Yelm Well #4	Assumed capacity of 750 gpm. Connected to WTS-3.	\$1,530,000	2017	\$196,988	\$1,333,013												
W-5	Southwest Yelm Well #5	Assumed capacity of 750 gpm. Connected to WTS-3.	\$1,530,000	2018		\$196,988	\$1,333,013											
W-6	Southwest Yelm Well #6	Assumed capacity of 750 gpm. Connected to WTS-4.	\$1,530,000	2023						\$196,988	\$1,333,013							
W-7	Southwest Yelm Well #7	Assumed capacity of 750 gpm. Connected to WTS-4.	\$1,530,000	2028											\$196,988	\$1,333,013		
RES-3	Southwest Yelm Reservoir #2	Located in southwest Yelm. Volume = 750,000 gallons. Reservoir will operate in 630 pressure zone.	\$3,231,900	2018		\$437,683	\$2,794,217											
RES-4	Southwest Yelm Reservoir #3	Located in southwest Yelm. Volume = 1 million gallons. Reservoir will operate in 630 pressure zone.	\$4,033,800	2024							\$437,683	\$3,596,117						
WTS -3	Water Treatment System #2	Located in vicinity of W-4 and RES-3. Water treatment system will provide disinfection and corrosion control. Cost estimate increased 50% to allow for potential for further treatment requirements for W-4 and W-5 in future.	\$1,950,000	2017	\$260,719	\$1,689,281												
WTS -4	Water Treatment System #3	Located in vicinity of W-6 and RES-4. Water treatment system will provide disinfection and corrosion control. Cost estimate same as for WTS-2.	\$1,950,000	2023						\$260,719	\$1,689,281							
TM-4	New Transmission Main #4	Construction of Main from W-4 to WTS-3. Length = 1700 ft	\$268,909	2017	\$31,781	\$237,128												
TM-5	New Transmission Main #5	Construction of Main from W-5 to WTS-3. Length = 2500 ft	\$395,454	2018		\$46,736	\$348,718											
TM-10	New Transmission Main #10	Approx. 12,000 feet of pipe to connect SW Yelm loop.	\$2,320,000	2018	\$329,100	\$995,450	\$995,450											
TM-6	New Transmission Mains #6	Construction of main from W-6 to WTS-4 and RES-4. Length = 1800 feet.	\$284,727	2022					\$33,650	\$251,077								
TM-7	New Transmission Mains #7	Construction of main from W-7 to WTS-4 and RES-4. Length = 1300 feet.	\$205,636	2028											\$24,303	\$181,334		
D-4 to D-10	Distribution System Projects	CIP budgets \$100K per year to complete a distribution system replacement projects. See Table 8-4 for projects that have been identified to address existing distribution system deficiencies.	\$100,000/year	N/A	\$200,000		\$200,000		\$200,000		\$200,000		\$200,000		\$200,000		\$200,000	
MIT	Mitigation Projects	Projects identified as part of mitigation plan. Might include monitoring, purchase of water rights in the Deschutes River basin, possibly reclaimed water projects.	\$100,000/year	N/A	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	
	CIP Totals		\$23,560,000		\$1,118,588	\$5,036,278	\$5,771,397	\$100,000	\$300,000	\$133,650	\$1,008,783	\$3,559,977	\$3,896,117	\$100,000	\$300,000	\$321,290	\$1,814,346	\$100,000

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The rate analysis described in Chapter 9 is conservative for the following reasons:

- It is assumed that there would be no growth in the system over the 6-year planning period, and consequently, there would be no revenue from System Development Charges (SDCs) and rate revenue would stay constant at 2009 levels.
- No revenue from irrigation rates is assumed over the 6-year planning period to account for the conservation program implanted in 2010.
- The rate analysis assumes the issuance of a \$10 million revenue bond in 2010. This revenue bond is sufficient to fund the CIP described in this chapter.

The adopted rate increase will support the recommended CIP provided that a) revenues are greater than those assumed in the financial plan (where no increase in revenue was assumed for a six year period) and/or b) projects in the later years of the CIP are delayed until after 2015.

Table 8-12. Comparison of 6-Year CIP to CIP Used in Capital Funding Plan			
Year		Capital Funding Plan (Table 9-2)	CIP (Table 8-8)
2009	2009 Projects	\$246,415	\$0
2010	New Well #1	\$863,494	\$863,494
	New Reservoir #1	\$1,379,543	\$1,379,543
	Water Treatment System #1	\$736,906	\$736,906
	Transmission Main #1	\$40,000	\$50,000
	SCADA	\$75,000	\$75,000
	AC Pipe Replacement	\$200,000	\$0
	Mitigation Projects	\$200,000	\$580,000
	Downtown Well Project		\$1,000,000
	Total	\$3,494,943	\$4,684,943
2011	New Well #1	\$666,506	\$666,506
	New Reservoir #1	\$1,050,458	\$1,050,458
	Water Treatment System #1	\$563,094	\$563,094
	Transmission Main #1	\$177,500	\$200,000
	AC Pipe Replacement	\$0	\$200,000
	Mitigation Projects	\$100,000	\$290,000
	Total	\$2,557,558	\$2,970,058
2012		\$300,000	\$300,000
2013		\$100,000	\$100,000
2014		\$595,474	\$595,474
2015		\$2,111,527	\$2,111,527
	Total 6-Year CIP	\$9,405,917	\$10,762,000