CHAPTER 8

IMPROVEMENT PROGRAM

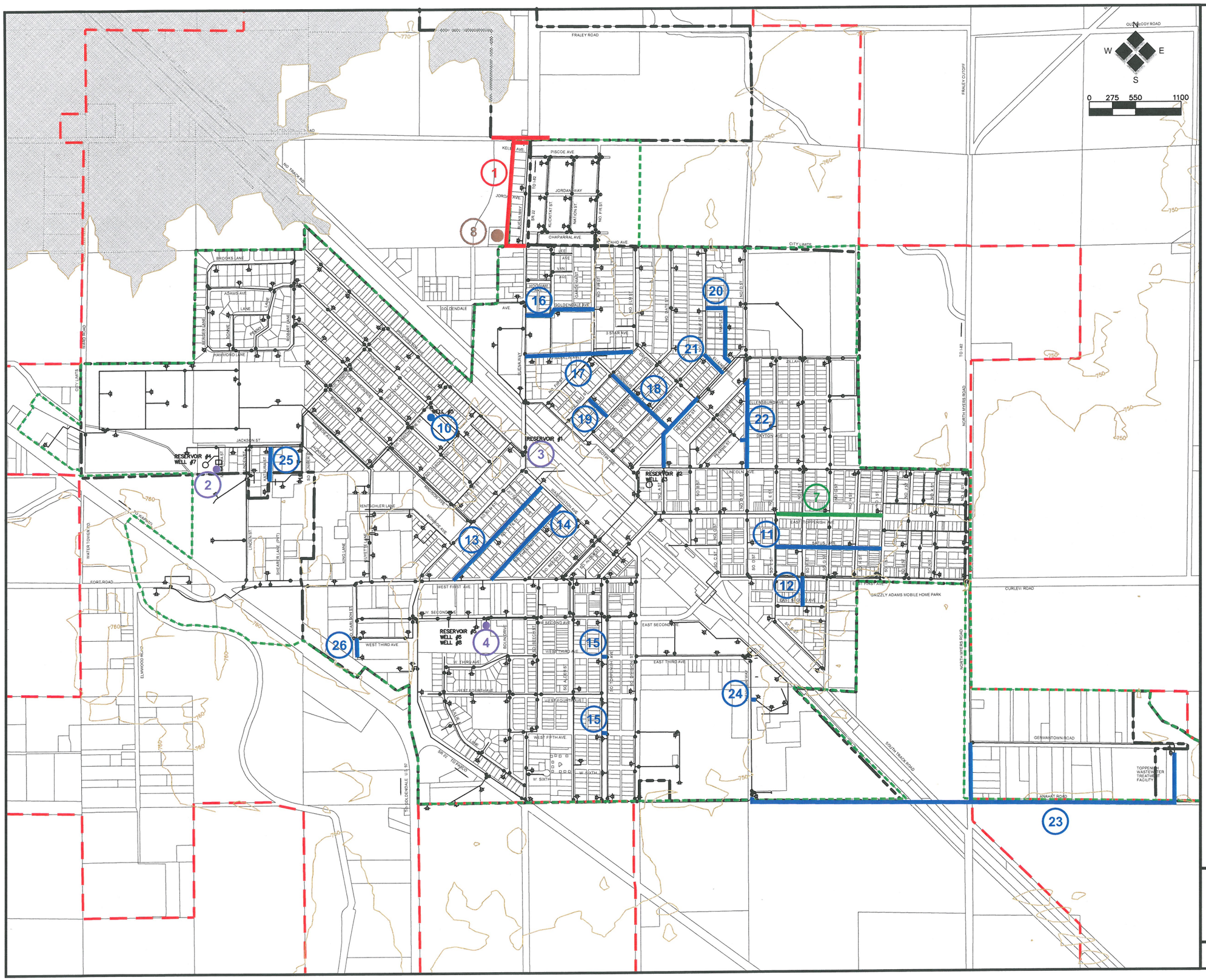
8.1 IMPROVEMENT PROGRAM OBJECTIVE

The development of a water system improvement program is a primary goal of this Water System Plan. Through the analysis of existing system demands, capabilities and deficiencies, and by projecting future system growth, the Plan has identified improvements.

In previous sections of this report, deficiencies in the existing City of Toppenish water system have been identified and specific improvements have been recommended. The costs of such improvements often prohibit their completion within a short time period without seriously impacting budgets and user rates. It is prudent, therefore, to group improvements so they might be reasonably accomplished over a number of years.

8.2 PRIORITIZED IMPROVEMENTS

The following is a prioritized listing of recommended system improvements, together with a brief description of the need, anticipated construction elements, and estimated project costs (based on 2010 construction costs). Actual costs will vary from those shown in the following estimates because of changes in the construction industry, the competitive bid process, the availability of materials and equipment, and the timing of the improvements. The estimated improvement costs should be increased by the rate of inflation for each subsequent year after 2010. The recommended improvements are identified in Figure 8-1, Recommended Water System Improvements. Since not all of the recommended improvements can be completed within the next six years, they have been separated into two categories: 1) year 2010 through year 2015 prioritized improvements; and 2) year 2016 through year 2029 prioritized improvements.



CITY OF TOPPENISH

Water System Plan Update

RECOMMENDED SYSTEM IMPROVEMENTS

LEGEND

- EXISTING SERVICE AREA
- TOPPENISH CITY LIMITS
- TOPPENISH UGA
- AREA ABOVE CURRENT MAXIMUM WATER SERVICE ELEVATION OF 770 FT

YEAR 2010 IMPROVEMENTS

1. WELL NO. 9 AND 16-INCH TRANSMISSION MAIN

YEAR 2011 IMPROVEMENTS

1. WELL NO. 9 AND 16-INCH TRANSMISSION MAIN
2. WELL NO. 7 ELECTRICAL IMPROVMENTS
3. DECOMMISSION WELL NOS. 1, 2, AND 4
4. WELL NO, 8 INSPECTION
5. RESERVIOR INSPECTION AND CLEANING
6. SOURCE WELL PROTECTIVE COVENANTS

YEAR 2012 IMPROVEMENTS

5. RESERVIOR INSPECTION AND CLEANING

YEAR 2013 IMPROVEMENTS

7. EAST TOPPENISH AVENUE 8-INCH WATER MAIN LOOP

YEAR 2014 IMPROVEMENTS

8. NEW 1.7 MG STANDPIPE RESERVOIR

YEAR 2016 IMPROVEMENTS

9. WATER SYSTEM PLAN UPDATE

FUTURE IMPROVEMENTS (2016-2029)

10. WELL NO. 5 REHABILITATION
11. SATUS AVENUE 8-INCH WATER MAIN LOOP
12. SOUTH F STREET 8-INCH WATER MAIN LOOP
13. SOUTH DATE STREET WATER MAIN UPSIZE
14. SOUTH CHESTNUT STREET WATER MAIN UPSIZE
15. WEST THIRD AND WEST FIFTH AVENUE WATER MAIN LOOPS
16. GOLDENDALE AVENUE WATER MAIN UPSIZE AND LOOPING
17. FRANKLIN AVENUE WATER MAIN UPSIZE
18. CHEHALIS AVENUE AND NORTH BEECH STREET WATER MAIN UPSIZE & LOOPING
19. BELLINGHAM AVENUE 8-INCH WATER MAIN LOOP
20. MAPLE COURT WATER MAIN UPSIZE
21. ELLENSBURG AVENUE 8-INCH WATER MAIN LOOP
22. NORTH D STREET WATER MAIN UPSIZE & 8-INCH LOOP
23. TOPPENISH WASTEWATER TREATMENT FACILITY 12-INCH WATER MAIN LOOP
24. DEL MONTE WATER MAIN LOOP
25. KATSURA STREET 8-INCH WATER MAIN LOOP
26. SOUTH CARLSON STREET WATER MAIN UPSIZE

Hulbregtse, Lonman Associates, Inc.
CIVIL ENGINEERING • LAND SURVEYING • PLANNING

5-16-2011
R:\Hydraulic Analysis\Toppenish\Toppenish Water Cad.dwg

FIGURE 8-1

8.2.1 Year 2010 Through Year 2015 Prioritized Improvements

1. WELL NO. 9 AND 16-INCH TRANSMISSION MAIN

Well No. 9 will be constructed on City owned property, north of Idaho Avenue and West of Buena Way, with a capacity of 600 GPM. The new well will meet projected future maximum day demand through 2015 and improve system reliability. Along with the well, this improvement will include construction of a 16-inch transmission main from the existing distribution system at the intersection of Buena Way and Idaho Avenue to Well No. 9, and then north to the intersection of Buena Way at Kelso Avenue. The transmission main will also extend to the north side of the canal at East McDonald Road for connections future development. Provided below are the estimated project costs, as provided by the City:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$103,000
Temporary Traffic Control	LS	–	–	$2,500
Temporary Water Polution/Erosion Control	LS	–	–	$2,500
Well Drilling, Casing & Testing	LS	–	–	$432,100
Pump and Pump House	LS	–	–	$325,000
Electrical and Telemetry	LS	–	–	$250,000
Water Transmission Main	LS	–	–	$327,500
HMA Surface Repair	SY	150	$50.00	$7,500

Construction Cost Subtotal	$1,450,100
Sales Tax (7.9%)	$114,600
Subtotal	$1,564,700
Contingency	$509,000
Subtotal	$2,073,700
Engineering & Administration (30%)	$622,000
Cultural Resources Survey	$6,000
Misc. Contingency	$189,600
TOTAL ESTIMATED COST	**$2,891,300**

2. WELL NO. 7 ELECTRICAL IMPROVEMENTS

Well No. 7 has been experiencing some electrical issues that could affect the performance and reliability of the City's largest source of supply. The electrical systems will be inspected and corrections will be made as required. The City estimates this inspection and repairs to cost approximately $251,500.

3. DECOMMISSION WELL NOS. 1, 2 AND 4

Well Nos. 1, 2 and 4 are located next to the Public Works shop and are currently inactive and have not been used for several years. This improvement project will involve decommissioning these existing wells in accordance with Yakama Nation Water Code Administration and Department of Ecology recommended procedures. The approximate cost of this improvement project is $54,000.

4. WELL NO. 8 INSPECTION

Well No. 8 has had sand production issues that have resulted in diminished capacity of the well. The City plans to remove the existing well pump for inspection and complete a video inspection of the well to determine the cause of the sand production issue. Further well rehabilitation and/or pump rebuild costs will be determined following the inspections.

Reducing the amount of sand produced from the well will extend the life of future pump installations. The approximate cost of this improvement project is $14,000.

5. RESERVOIR INSPECTION AND CLEANING

The City's existing water storage reservoirs were last cleaned and inspected in 2003. The City plans to inspect and clean Reservoir No. 2 and Reservoir No. 4 in 2010 at a cost of approximately $12,500 and Reservoir No. 3 in 2011 at a cost of approximately $6,000. Any necessary repairs as a result of the reservoir inspections will be scheduled to be made as a future improvement.

6. SOURCE WELL PROTECTIVE COVENANTS

The City of Toppenish owns all of its well sites, but none of them appear have a recorded protective covenant establishing a 100-foot radius of sanitary protection, in accordance with Department of Health requirements, for source wells. The City plans to execute and file a "Declaration of Covenant" for their five source wells with the Yakima County Auditor's Office. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Survey of Well Locations	LS	–	–	$5,000
Legal Description Preparation	LS	–	–	$10,000
Covenant Preparation and Filing	LS	–	–	$2,500
			TOTAL ESTIMATED COST	**$17,500**

7. EAST TOPPENISH AVENUE 8-INCH WATER MAIN LOOP

This improvement project will included the construction of a new 8-inch water main loop in East Toppenish Avenue, from E Street to I Street and tying in the intersecting 4-inch water mains in F Street, G Street, and H Street. Looping these water mains will significantly increase fire flow in this area from 540 to 2,570 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$15,000
Temporary Traffic Control	LS	–	–	$10,000
8-Inch Water Main	LF	1,300	$45.00	$58,500
8-Inch Gate Valve	EA	19	$1,100	$20,900
Fire Hydrant Assembly	EA	2	$3,000	$6,000
HMA Surface Repair	SY	880	$50.00	$44,000

Construction Cost Subtotal	$154,400
Sales Tax (7.9%)	$12,200
Subtotal	$166,600
Contingency (15%)	$25,000
Subtotal	$191,600
Engineering & Administration (25%)	$47,900
TOTAL ESTIMATED COST	**$239,500**

8. NEW 1.7 MG STANDPIPE RESERVOIR

The City's existing reservoir capacity will be exceeded by 2015. Construction of a new 1.7 MG reservoir near Well No. 9 will provide additional storage capacity to the northern side of the existing and future service area boundaries. The additional capacity will provide adequate storage to meet future system demands for the next 20 years. Provided below are the estimated costs for this improvement:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$150,000
Reservoir Excavation & Backfill	LS	–	–	$20,000
1.7 MG Reservoir (46' Diam. X 135' High)	LS	–	–	$2,125,000
Inlet/Outlet Valve Vault	LS	–	–	$30,000
Site Piping	LS	–	–	$20,000
Site Grading	LS	–	–	$10,000
Gravel Surfacing	SY	200	$5.00	$1,000

Construction Cost Subtotal	$2,356,000
Sales Tax (7.9%)	$186,000
Subtotal	$2,542,000
Contingency (15%)	$381,000
Subtotal	$2,923,000
Engineering & Administration (25%)	$730,800
TOTAL ESTIMATED COST	**$3,653,800**

9. WATER SYSTEM PLAN UPDATE

The Department of Health requires Water System Plans to be reviewed and updated every six years. Updating the Water System Plan in 2015 is estimated to cost approximately $60,000.

8.2.2 Year 2016 Through Year 2029 Prioritized Improvements

10. WELL NO. 5 REHABILITATION

Well No. 5 has experienced a decline in capacity from its original 950 GPM for unknown reasons. With this improvement project the Well No. 5 pump will be removed and the well will be inspected to determine the cause for loss of production. Upon inspection, the extent of rehabilitation and/or redrilling will be determined. Also included in this improvement project will be the rehabilitation of the well building to improve ventilation in the chlorine room and relocation of the source meter to a vault outside the building, which will provide the correct separation from upstream and downstream valves and improve meter accuracy. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$20,000
Well No. 5 Pump Removal & Rehab.	LS	–	–	$20,000
Well No. 5 Video Inspection	LS	–	–	$10,000
Rehab. Exist. Bldg., Incl. Chlorine Rm. Vent.	LS	–	–	$100,000
Install Well Level Transducer	LS	–	–	$10,000
Misc. Electrical Improvements	LS	–	–	$50,000
New Meter Vault	LS	–	–	$30,000

Construction Cost Subtotal	$240,000
Sales Tax (7.9%)	$19,000
Subtotal	$259,000
Contingency (15%)	$38,900
Subtotal	$297,900
Engineering & Administration (25%)	$74,500
TOTAL ESTIMATED COST	**$372,400**

11. SATUS AVENUE 8-INCH WATER MAIN LOOP

This improvement project will included the construction of a new 8-inch water main loop in Satus Avenue, from E Street to I Street and tying in the intersecting 4-inch water mains in F Street, G Street, and H Street. Looping these water mains will significantly increase fire flow in this area from 440 to 1,430 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$15,000
Temporary Traffic Control	LS	–	–	$10,000
8-Inch Water Main	LF	1,300	$45.00	$58,500
10-Inch Gate Valve	EA	2	$1,600	$3,200
8-Inch Gate Valve	EA	19	$1,100	$20,900
Fire Hydrant Assembly	EA	3	$3,000	$9,000
HMA Surface Repair	SY	880	$50.00	$44,000

Construction Cost Subtotal	$160,600
Sales Tax (7.9%)	$12,700
Subtotal	$173,300
Contingency (15%)	$26,000
Subtotal	$199,300
Engineering & Administration (25%)	$49,800
TOTAL ESTIMATED COST	**$249,100**

12. SOUTH F STREET 8-INCH WATER MAIN LOOP

This improvement project will loop the existing 10-inch cast iron water main in East First Avenue to the 4-inch cast iron water main in East Second Avenue, along South F Street. The proposed 8-inch water main will be located within the roadway on South F Street. Looping these water mains will increase fire flow from 730 to 1,400 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$6,000
Temporary Traffic Control	LS	–	–	$4,000
8-Inch Water Main	LF	370	$45.00	$16,650
10-Inch Gate Valve	EA	2	$1,600	$3,200
8-Inch Gate Valve	EA	8	$1,100	$8,800
Fire Hydrant Assembly	EA	2	$3,000	$6,000
HMA Surface Repair	SY	260	$50.00	$13,000

Construction Cost Subtotal	$57,650
Sales Tax (7.9%)	$4,550
Subtotal	$62,200
Contingency (15%)	$9,330
Subtotal	$71,530
Engineering & Administration (25%)	$17,880
TOTAL ESTIMATED COST	**$89,410**

13. SOUTH DATE STREET WATER MAIN UPSIZE

This improvement project will replace the existing 4-inch cast iron pipeline in South Date Street, from West First Avenue to Washington Avenue. The improvement will replace undersized and aging cast iron pipelines, improving both fire flow capacity (from 500 to 3,120 GPM) and system reliability in this residential area. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$15,000
Temporary Traffic Control	LS	–	–	$10,000
8-Inch Water Main	LF	1,550	$45.00	$69,750
8-Inch Gate Valve	EA	9	$1,100	$9,900
Service Connection, 3/4 In. Diam.	EA	40	$1,200	$48,000
Fire Hydrant Assembly	EA	4	$3,000	$12,000
HMA Surface Repair	SY	1,300	$50.00	$65,000

Construction Cost Subtotal	$229,650
Sales Tax (7.9%)	$18,100
Subtotal	$247,750
Contingency (15%)	$37,200
Subtotal	$284,950
Engineering & Administration (25%)	$71,240
TOTAL ESTIMATED COST	**$356,190**

14. SOUTH CHESTNUT STREET WATER MAIN UPSIZE

This improvement project will replace the existing 4-inch cast iron pipeline in South Chestnut Street, from West First Avenue to Washington Avenue. The improvement will replace undersized and aging cast iron pipelines, improving both fire flow capacity (from 630 to 3,700 GPM) and system reliability in this residential area. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$16,000
Temporary Traffic Control	LS	–	–	$9,000
8-Inch Water Main	LF	1,250	$45.00	$56,250
8-Inch Gate Valve	EA	8	$1,100	$8,800
Service Connection, 3/4 In. Diam.	EA	30	$1,200	$36,000
Fire Hydrant Assembly	EA	3	$3,000	$9,000
HMA Surface Repair	SY	1,050	$50.00	$52,500

Construction Cost Subtotal	$187,550
Sales Tax (7.9%)	$14,800
Subtotal	$202,350
Contingency (15%)	$30,400
Subtotal	$232,750
Engineering & Administration (25%)	$58,190
TOTAL ESTIMATED COST	**$290,940**

15. WEST THIRD AND WEST FIFTH AVENUE WATER MAIN LOOPS

The improvement project will loop the existing 4-inch cast iron water main to the 8-inch ductile iron water main in South Toppenish Avenue at West Third Avenue and at West Fifth Avenue. The proposed 8-inch water main will be located within the roadway on both West Third Avenue and West Fifth Avenue. Looping the water mains will increase fire flow from 670 to 1,410 GPM at West Third Avenue and from 570 to 1,410 GPM at West Fifth Avenue. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$5,000
Temporary Traffic Control	LS	–	–	$2,000
8-Inch Water Main	LF	140	$45.00	$6,300
8-Inch Gate Valve	EA	12	$1,100	$13,200
HMA Surface Repair	SY	120	$50.00	$6,000

Construction Cost Subtotal	$32,500
Sales Tax (7.9%)	$2,670
Subtotal	$35,170
Contingency (15%)	$5,280
Subtotal	$40,450
Engineering & Administration (25%)	$10,110
TOTAL ESTIMATED COST	**$50,560**

16. GOLDENDALE AVENUE WATER MAIN UPSIZE AND LOOPING

This improvement project will loop the existing 10-inch cast iron water main in Beuna Way to the 6-inch cast iron water main in North Fir Street, within Goldendale Avenue. The proposed 8-inch water main will be located on the south edge of Goldendale Avenue in the gravel shoulder and will replace the existing 6-inch cast iron water main in Goldendale Avenue. Looping these water mains will significantly increase fire flow capacity from 1,520 to 4,230 GPM in this area. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$10,000
Temporary Traffic Control	LS	–	–	$8,000
8-Inch Water Main	LF	870	$45.00	$39,150
10-Inch Gate Valve	EA	2	$600	$1,200
8-Inch Gate Valve	EA	8	$1,100	$8,800
HMA Surface Repair	SY	100	$50.00	$5,000
Gravel Surface Repair	SY	500	$5.00	$2,500

Construction Cost Subtotal	$74,650
Sales Tax (7.9%)	$6,100
Subtotal	$80,750
Contingency (15%)	$12,100
Subtotal	$92,850
Engineering & Administration (25%)	$23,210
TOTAL ESTIMATED COST	**$116,060**

17. FRANKLIN AVENUE WATER MAIN UPSIZE

This improvement project will replace the existing 4-inch cast iron and 6-inch AC water mains in Franklin Avenue, from Buena Way to North Fir Street, and extend the Franklin Avenue water main to the intersection of North Elm Street and Dayton Avenue. This improvement will replace undersized and aging cast iron pipelines, improving both fire flow capacity (from 1,330 to 4,480 GPM) and system reliability in this residential area and around the Toppenish Middle School. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$15,000
Temporary Traffic Control	LS	–	–	$10,000
8-Inch Water Main	LF	1,300	$45.00	$58,500
10-Inch Gate Valve	EA	2	$1,600	$3,200
8-Inch Gate Valve	EA	9	$1,100	$9,900
Fire Hydrant Assembly	EA	4	$3,000	$12,000
Service Connection, 3/4 In. Diam.	EA	22	$1,200	$26,400
HMA Surface Repair	SY	900	$50.00	$45,000

Construction Cost Subtotal	$180,000
Sales Tax (7.9%)	$14,200
Subtotal	$194,200
Contingency (15%)	$29,100
Subtotal	$223,300
Engineering & Administration (25%)	$55,800
TOTAL ESTIMATED COST	**$279,100**

18. CHEHALIS AVENUE AND NORTH BEECH STREET WATER MAIN UPSIZE & LOOPING

This improvement project will replace the existing 4-inch cast iron water main in North Beech Street, from Lincoln Avenue to Dayton Avenue. The improvements will also loop the existing 6-inch cast iron water main in North Elm Street to the proposed 8-inch water main in North Beech Street. The proposed 8-inch water mains will be located within the roadway on North Beech Street and Chehalis Avenue. Each of the existing 4-inch water mains intersecting the proposed 8-inch water main will be tied into the loop. Upsizing and looping these water mains will significantly increase fire flow in the local vicinity from 440 to 1,400 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$20,000
Temporary Traffic Control	LS	–	–	$13,000
8-Inch Water Main	LF	2,050	$45.00	$92,250
8-Inch Gate Valve	EA	21	$1,100	$23,100
Fire Hydrant Assembly	EA	1	$3,000	$3,000
HMA Surface Repair	SY	1,400	$50.00	$70,000

Construction Cost Subtotal	$221,350
Sales Tax (7.9%)	$17,500
Subtotal	$238,850
Contingency (15%)	$35,800
Subtotal	$274,650
Engineering & Administration (25%)	$68,660
TOTAL ESTIMATED COST	**$343,310**

19. BELLINGHAM AVENUE 8-INCH WATER MAIN LOOP

This improvement project will loop the existing 4-inch cast iron water main in North Elm Street to the 4-inch cast iron water main in North Date Street, along Bellingham Avenue. The proposed 8-inch water main will be located on the south edge of Bellingham Avenue in the gravel shoulder. Looping these water mains will significantly increase fire flow from 460 to 1,230 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$5,000
Temporary Traffic Control	LS	–	–	$2,000
8-Inch Water Main	LF	320	$45.00	$14,400
8-Inch Gate Valve	EA	6	$1,100	$6,600
Fire Hydrant Assembly	EA	1	$3,000	$3,000
HMA Surface Repair	SY	30	$50.00	$1,500
Gravel Surface Repair	SY	200	$5.00	$1,000

Construction Cost Subtotal	$33,500
Sales Tax (7.9%)	$2,650
Subtotal	$36,150
Contingency (15%)	$5,420
Subtotal	$41,570
Engineering & Administration (25%)	$10,400
TOTAL ESTIMATED COST	**$51,970**

20. MAPLE COURT WATER MAIN UPSIZE

This improvement project will replace the existing 4-inch cast iron water main in Maple Court, from North Chestnut Street to North Beech Street. The improvement will replace undersized and aging cast iron pipelines, improving both fire flow capacity (from 630 to 1,740 GPM) and system reliability in this residential area. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$10,000
Temporary Traffic Control	LS	–	–	$4,000
8-Inch Water Main	LF	930	$45.00	$41,850
8-Inch Gate Valve	EA	6	$1,100	$6,600
Service Connection, 3/4 In. Diam.	EA	22	$1,200	$26,400
HMA Surface Repair	SY	490	$50.00	$24,500
Gravel Surface Repair	SY	150	$5.00	$750

Construction Cost Subtotal	$114,100
Sales Tax (7.9%)	$9,000
Subtotal	$123,100
Contingency (15%)	$18,500
Subtotal	$141,600
Engineering & Administration (25%)	$35,400
TOTAL ESTIMATED COST	**$177,000**

21. ELLENSBURG AVENUE 8-INCH WATER MAIN LOOP

This improvement project will loop the existing 4-inch cast iron water main in North Chestnut Street to the 4-inch cast iron and 8-inch ductile iron water mains in North Beech Street. The proposed 8-inch water main will be located on the south edge of Ellensburg Avenue in the gravel shoulder. Looping these water mains will significantly increase fire flow from 410 to 1,270 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$5,000
Temporary Traffic Control	LS	–	–	$4,000
8-Inch Water Main	LF	330	$45.00	$14,850
8-Inch Gate Valve	EA	8	$1,100	$8,800
Gravel Surface Repair	SY	230	$5.00	$1,150

Construction Cost Subtotal	$33,800
Sales Tax (7.9%)	$2,670
Subtotal	$36,470
Contingency (15%)	$5,470
Subtotal	$41,940
Engineering & Administration (25%)	$10,490
TOTAL ESTIMATED COST	**$52,430**

22. NORTH D STREET WATER MAIN UPSIZE & 8-INCH LOOP

This improvement project will replace the existing 4-inch cast iron water main in North D Street, from Lincoln Avenue to North Alder Street. The improvements will also loop the existing 6-inch cast iron water main in Dayton Avenue to the proposed 8-inch water main in North D Street. The proposed 8-inch water main will be located along the west edge of North D Street in the grass area. Upsizing and looping these water mains will significantly increase fire flow from 670 to 3,020 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$10,000
Temporary Traffic Control	LS	–	–	$5,000
8-Inch Water Main	LF	1,160	$45.00	$52,200
8-Inch Gate Valve	EA	10	$1,100	$11,000
Service Connection, 3/4 In. Diam.	EA	16	$1,200	$19,200
Fire Hydrant Assembly	EA	2	$3,000	$6,000
HMA Surface Repair	SY	90	$50.00	$4,500
Sodded Lawn Repair	SY	700	$15.00	$10,500

Construction Cost Subtotal	$118,400
Sales Tax (7.9%)	$9,350
Subtotal	$127,750
Contingency (15%)	$19,200
Subtotal	$146,950
Engineering & Administration (25%)	$36,740
TOTAL ESTIMATED COST	**$183,690**

23. TOPPENISH WASTEWATER TREATMENT FACILITY 12-INCH WATER MAIN LOOP

This improvement project will loop the existing 12-inch PVC water main stub near Wishkoski Way to the 8-inch ductile iron water main in Germantown Road at North Myers Road, and at the dead-end 8-inch water main near the wastewater treatment facility. The proposed 12-inch water main will primarily be located outside of the roadway along Anahat Road in the gravel shoulder. Looping these water mains will significantly increase fire flow from 730 to 2,520 GPM at Germantown Road and from 530 to 1,960 GPM near the wastewater treatment facility. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$35,000
Temporary Traffic Control	LS	–	–	$20,000
Jack/Bore 24-Inch Steel Casing	LF	700	$500	$350,000
12-Inch Water Main	LF	5,750	$55.00	$316,250
8-Inch Water Main	LF	720	$45.00	$32,400
12-Inch Butterfly Valve	EA	3	$1,800	$5,400
8-Inch Gate Valve	EA	4	$1,100	$4,400
Fire Hydrant Assembly	EA	6	$3,000	$18,000
HMA Surface Repair	SY	200	$50.00	$10,000
Gravel Surface Repair	SY	2,000	$5.00	$10,000

Construction Cost Subtotal	$801,450
Sales Tax (7.9%)	$63,300
Subtotal	$864,750
Contingency (15%)	$130,000
Subtotal	$994,750
Engineering & Administration (25%)	$248,700
TOTAL ESTIMATED COST	**$1,243,450**

24. DEL MONTE WATER MAIN LOOP

This improvement project will loop the existing 12-inch ductile iron water main in Wishkoski Way to the dead-end 8-inch AC water main serving the Del Monte industrial facility. The proposed 8-inch water main will be located within the roadway on Wishkoski Way. Looping these water mains will significantly increase fire flow from 690 to 2,330 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$5,000
Temporary Traffic Control	LS	–	–	$2,000
8-Inch Water Main	LF	60	$45.00	$2,700
12-Inch Butterfly Valve	EA	2	$1,800	$3,600
8-Inch Gate Valve	EA	1	$1,100	$1,100
HMA Surface Repair	SY	50	$50.00	$2,500

Construction Cost Subtotal	$16,900
Sales Tax (7.9%)	$1,390
Subtotal	$18,290
Contingency (15%)	$2,740
Subtotal	$21,030
Engineering & Administration (25%)	$5,260
TOTAL ESTIMATED COST	**$26,290**

25. KATSURA STREET 8-INCH WATER MAIN LOOP

This improvement project will loop the existing 12-inch AC water main in Jackson Street to the 8-inch AC water main extending from South Juniper Street. The proposed 8-inch water main will be located within the roadway along Katsura Street. Looping these water mains will significantly increase fire flow from 850 to 3,120 GPM. This project will also provide an additional measure of reliability to the system as valves will be added allowing isolation for maintenance and/or repairs. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$6,000
Temporary Traffic Control	LS	–	–	$4,000
8-Inch Water Main	LF	420	$45.00	$18,900
12-Inch Butterfly Valve	EA	2	$1,800	$3,600
8-Inch Gate Valve	EA	3	$1,100	$3,300
Service Connection, 3/4 In. Diam.	EA	7	$1,200	$8,400
HMA Surface Repair	SY	290	$50.00	$14,500

Construction Cost Subtotal	$58,700
Sales Tax (7.9%)	$4,640
Subtotal	$63,340
Contingency (15%)	$9,500
Subtotal	$72,840
Engineering & Administration (25%)	$18,210
TOTAL ESTIMATED COST	**$91,050**

26. SOUTH CARLSON STREET WATER MAIN UPSIZE

This improvement project will replace the existing 6-inch PVC pipeline in South Carlson Street, from West Third Avenue to the south. The improvement will replace undersized pipe, improving both fire flow capacity (from 1,430 to 3,210 GPM) and system reliability in this commercial area. Provided below are the estimated project costs:

Item	Unit	Qty.	Unit Cost	Total Cost
Mobilization	LS	–	–	$5,000
Temporary Traffic Control	LS	–	–	$2,000
8-Inch Water Main	LF	230	$45.00	$10,350
8-Inch Gate Valve	EA	3	$1,100	$3,300
Service Connection, 3/4 In. Diam.	EA	3	$1,200	$3,600
Gravel Surfacing Repair	SY	180	$5.00	$900

Construction Cost Subtotal	$25,150
Sales Tax (7.9%)	$1,990
Subtotal	$27,140
Contingency (15%)	$4,070
Subtotal	$31,210
Engineering & Administration (25%)	$7,800
TOTAL ESTIMATED COST	**$39,010**

8.3 FUTURE SYSTEM IMPROVEMENTS

Though not included in Section 8.2, there may be other future system improvements that are necessary for system expansion. Other future system improvement types and locations will depend upon proposed future development and City growth. As development is proposed and/or occurs, the City will need to review the effects that the system expansion plans will have on the existing distribution system.

8.4 IMPROVEMENT SCHEDULE

Table 8-1 provides a 6-year schedule for completion of many of the recommended improvements identified in Section 8.2. Scheduling of the remaining improvements beyond this 6-year period should be reviewed yearly as priorities and City growth patterns change and progress. The estimated improvement costs are provided in Table 8-1, as well as the total projected yearly cost. The estimated costs in Table 8-1 have been inflated for each year after 2010 to reflect the possible future costs, based upon the projected year the improvement will be completed. Improvements that will take place after year 2015 have been inflated to reflect year 2016 costs, although many of these improvements will take place after the year 2016.

TABLE 8-1 SCHEDULE OF RECOMMENDED IMPROVEMENTS

Priority No.	Improvement Description	Estimated Cost in 2010 Dollars	Completion Year							Funding Source
			2010	2011	2012	2013	2014	2015	2016 to 2029	
1	Well No. 9 & 16-Inch Trans. Main	2,891,300	50,500	2,832,263*						PWTF Loan
2	Well No. 7 Electrical Improvements	251,500		251,500						
3	Decommission Well Nos. 1, 2, and 4	54,000		54,000						City
4	Well No. 8 Inspection	14,000		14,000						City
5	Reservoir Inspection & Cleaning	18,500		12,500	6,400					City
6	Source Well Protective Covenants	17,500		18,100						City
7	E.Toppenish Ave. 8-Inch Loop	239,500				261,700				PWTF Loan
8	New 1.7 MG Standpipe Reservoir	3,653,800					4,112,400			PWTF Loan
9	Water System Plan Update	60,000							71,700	City
10	Well No. 5 Rehabilitation	372,400							444,700	City
11	Satus Avenue 8-Inch Water Main Loop	249,100							297,500	City
12	South F Street 8-Inch Water Main Loop	89,410							106,800	City
13	South Date Street Water Main Upsize	356,190							425,300	City
14	S. Chestnut Street Water Main Upsize	290,940							347,400	City
15	W. Third & W. Fifth Ave. Loops	50,560							60,400	City
16	Goldendale Ave. Upsize & Loop	116,060							138,600	City
17	Franklin Avenue Water Main Upsize	279,100							333,300	City
18	Chehalis Ave. & N. Beech St. Upsize	343,310							410,000	City
19	Bellingham Avenue 8-Inch Loop	51,970							62,100	City
20	Maple Court Water Main Upsize	177,000							211,400	City
21	Ellensburg Ave. 8-Inch Water Main Loop	52,430							62,600	City
22	North D St. Water Main Upsize & Loop	183,690							219,400	City
23	Toppenish WWTF 12-Inch Loop	1,243,450							1,484,800	City
24	Del Monte Water Main Loop	26,290							31,400	City
25	Katsura St. 8-Inch Water Main Loop	91,050							108,800	City
26	S. Carlson St. Water Main Upsize	39,010							46,600	City
	TOTAL COSTS	11,212,060	50,500	3,182,363	6,400	261,700	4,112,400	0	4,862,800	

Note: Improvement costs for years following 2010 include 3% inflation per year.
* Represents estimated 2011 project costs. Approx. $8,537was spent in 2009.