WATER SUPPLY FACILITIES[1]

The following is a summary of the 2008 Water System Master Plan prepared by Civil West Engineering Services, Inc. The purpose of this section is to provide an executive level summary for review of the basic information contained in the body of this master planning effort. The Executive Summary section is intended to provide a brief overview for readers who want to quickly obtain the main points without having to research the entire document. The section is also intended to be helpful for readers who are seeking a quick reference for planning information.

Each subsection within the Executive Summary was developed to provide a summary for each section within the master plan itself. Therefore, subsection ES-1 provides a summary of Section 1, subsection ES-2 provides a summary of Section 2, and so on.

For more detailed information on any subject discussed within the Executive Summary, the reader should turn to the section in the master plan that is being summarized.

ES-1 Summary of Section 1 - Introduction

The City of Newport is located in Lincoln County Oregon approximately in the center of the County coastline (44°37'57"N, 124°03'23"W) at the mouth of the Yaquina River.

The City owns and operates a water system that includes raw water supplies and intakes, water treatment facilities, water distribution facilities, and treated water storage facilities. The City has operated a water system for over 60 years and works hard to maintain and manage the system.

The Oregon Department of Human Services, Drinking Water Program, regulates the need for water master planning in the State of Oregon. The laws governing public water systems require that all water providers maintain a current water master plan. Master plans are to be updated on intervals no longer than 20 years and are often updated every ten years. The City's previous master plan was completed in 1988 and by completing this current update the City is complying with the Department's planning requirements. Additionally, raw water supply concerns and water treatment capacity limitations progressed to the point where solution planning needed to commence immediately.

Planning was authorized to begin in September of 2007. Planning was undertaken and managed with the aid of a Water System Task Force comprised of community members with specific insights or backgrounds pertinent to water planning in Newport. The Task Force reviewed the planning progress, provided insight and feedback, and directed and sustained much of the actions of the consultants in preparing this planning effort.

ES-2 Summary of Section 2 – Study Area

Section 2 summarizes many of the physical, environmental, socio-economic, and population issues related to the city of Newport and the surrounding area. The Section includes detailed

**Section replaced in its entirety by Ordinance No. 1978 (4-20-2009)*

[1] See also adopted South Beach Neighborhood Plan for additional analysis and amendments regarding this Section for the South Beach Neighborhood Plan area.

mapping defining the City Limits, Urban Growth Boundary, wetland issues, flood plain issues, and other relevant information.

Section 2 includes an analysis of historic population and growth trends and develops an analysis for future population growth.

Table 1 below summarizes the population analysis developed in this plan and utilized for all planning and sizing criteria for proposed facilities. An average growth rate of 1.25% was selected to estimate future populations. The selected 1.25% growth rate matches actual average growth over the last 100 years in Newport.

Table 1 – Population Analysis and Summary – City of Newport

	1.25% Growth Inside City Limits			1.25% Growth Outside City Limits, Inside UGB			OCCC Central Campus	Total		
Year	Population	Housing Units	EDU	Population	Housing Units	EDU	EDU	Population	Housing Units	EDU
2007	10,455	5,501	11,270					10,455	5,501	11,270
2008	10,586	5,601	11,411					10,586	5,601	11,411
2009	10,718	5,671	11,554					10,718	5,671	11,554
2010	10,852	5,742	11,698	140	74	119		10,992	5,816	11,817
2011	10,988	5,814	11,845	142	75	120	410	11,129	5,889	12,375
2012	11,125	5,886	11,993	144	76	122	410	11,269	5,962	12,525
2013	11,264	5,960	12,143	145	77	124	410	11,409	6,037	12,676
2014	11,405	6,034	12,294	147	78	125	410	11,552	6,112	12,829
2015	11,547	6,110	12,448	149	79	127	410	11,696	6,189	12,985
2016	11,692	6,186	12,604	151	80	128	410	11,843	6,266	13,142
2017	11,838	6,263	12,761	153	81	130	410	11,991	6,344	13,301
2018	11,986	6,342	12,921	155	82	131	410	12,140	6,424	13,462
2019	12,136	6,421	13,082	157	83	133	410	12,292	6,504	13,625
2020	12,287	6,501	13,246	159	84	135	820	12,446	6,585	14,201
2021	12,441	6,583	13,411	160	85	136	820	12,601	6,667	14,368
2022	12,596	6,665	13,579	163	86	138	820	12,759	6,751	14,537
2023	12,754	6,748	13,749	165	87	140	820	12,918	6,835	14,709
2024	12,913	6,832	13,921	167	88	142	820	13,080	6,921	14,882
2025	13,075	6,918	14,095	169	89	143	820	13,243	7,007	15,058
2026	13,238	7,004	14,271	171	90	145	820	13,409	7,095	15,236
2027	13,404	7,092	14,449	173	91	147	820	13,577	7,183	15,416
2028	13,571	7,181	14,630	175	93	149	820	13,746	7,273	15,599
2029	13,741	7,270	14,813	177	94	151	820	13,918	7,364	15,783
2030	13,913	7,361	14,998	179	95	153	820	14,092	7,456	15,970
Change	3,458	1,860	3,728	39	21	34	820	3,637	1,955	4,700

UGB = Urban Growth Boundary
EDU = Equivalent Dwelling Unit (water use equal to that of one typical single-family dwelling)
OCCC = Oregon Coast Community College

Based on this analysis, it is anticipated that approximately 3,458 persons will be added to the system over the planning period or around 4,700 new equivalent dwelling units including all growth sectors (residential, commercial, industrial, institutional, etc.). For more information on this analysis, see Section 2.

ES-3 Summary of Section 3- Regulatory Environment

Section 3 provides a summary of the current rules governing the management and operation of a public water system and basic water quality requirement rules at the time of this planning effort. As federal and state water quality requirements continue to become more stringent over time, water providers must upgrade their systems and improve operations to ensure that water quality standards are met. The City complies with current rules. However, continuing to meet the

current and anticipated rules with aging facilities and increasing population is unlikely without system improvements.

ES-4 Summary of Section 4 – Design Criteria and Service Goals

The purpose of Section 4 is to establish the criteria that will be used in the planning effort to size facilities, identify deficiencies, and plan for improvements. In general, Section 4 defines the standards used to measure the effectiveness of the existing water system and to determine improvements needed to ensure future health of the system. The selected planning goals include:

- Raw water supply – 20-year maximum day demand (MDD) of 10.83 cfs
- Water treatment capacity – 20-year MDD with 20-hour plant runtime, 7.0 mgd
- Treated water storage capacity – 1.25xMDD plus fire storage, 8.2 million gallons
- Fire protection requirements – 1000 gpm residential minimum, 4000 gpm for major structures and schools

The basis used for establishing cost estimates in the master plan is also presented in this section. Construction costs are tied to a national construction index known as the Engineering News Record (ENR) Index Construction Cost Index. The index is published monthly and can be used to update project costs in the master plan over time. Costs in this Plan are based on an ENR index of 7967.

ES-5 Summary of Section 5 – Existing Water System

Section 5 provides a detailed description of all of the water system components in the City's existing water system. A summary of these components is provided below.

Water Rights

The City of Newport holds several water rights in the area. The only rights that are of practicable use are the rights on Big Creek and the Siletz River. Table 2 below summarizes the existing water rights held by Newport.

Table 2 – Newport Water Rights

Source Name	Application	Permit	Certificate	Priority Date	POD Rate (cfs)
Blattner Creek	S72	S20	1012	5/10/1909	0.54
Nye Creek	S8970	S5882	8603	5/14/1923	1.5
Nye Creek	S9224	S6197	9113	10/15/1923	0.7
Hurbert Creek	S9221	S6194	9112	10/15/1923	0.1
Big Creek	S11156	S7722	9127	10/27/1926	10.0
Siletz River	S39121	S29213	~	9/24/1963	6.0
Jeffries Creek	S44381	S33151	57650	1/9/1968	0.4
					19.24
Storage	**Application**	**Permit**	**Certificate**	**Priority Date**	**Storage (acre-feet)**
Big Creek Res. #1	S26388	S20703	21357	8/31/1951	200
Big Creek Res. #2	S43413	S33127	48628	3/24/1967	310
Big Creek Res. #2	S43413	S33127	48628	6/5/1968	35
Big Creek Res. #2	S52204	S38220	~	7/19/1974	625

Raw Water Facilities

The Big Creek intake facility, located near the treatment plant, pumps raw water to the treatment facility from the Lower Big Creek Reservoir (Reservoir #1). The City also diverts water from the Siletz River near the City of Siletz and pumps raw water through five miles of 16-inch and 18-inch piping. The Siletz water is deposited into the Upper Big Creek Reservoir (Reservoir #2) where it is held until it flows into the Lower Big Creek Reservoir.

Treatment Facilities

The existing treatment plant is classified as a conventional type facility utilizing two circular solids contact clarifiers (clariflocculators), four mixed-media gravity filters, chlorine disinfection, and other related facilities. The existing plant is capable of treating between 3.5 and 4 million gallons per day (mgd) of water though it struggles with water quality during the peak demand season mostly due to high levels of manganese in the raw water. The plant is in excess of 60 years of age and has several deficiencies causing operational difficulties and vulnerabilities. During peak demand seasons, the plant often operates for 24 hours a day but is still unable to maintain storage tank levels in the system. The storage tank drop with plant operating at full capacity indicates community peak water demands now exceed the capacity of the plant. The plant has been well operated and maintained but has reached the end of its useful life. A detailed discussion of all treatment components is provided in Section 5.

Treated Water Storage

The Newport water system includes 7 treated water storage tanks providing a total combined maximum storage volume of 8.2 million gallons. All tanks are constructed with steel with the exception of two concrete tanks referred to as the City Shop Tanks. The existing storage volume is adequate for the planning period when the tanks are all full. However, the lack of significant storage at the north end of town results in fire flow deficiencies in that area.

Table 3 – Treated Water Reserve Summary

Name	Nominal Volume	Year Installed	Base Elevation	Overflow Elevation	Diameter (ft)	Height (ft)	Max. Working Volume (gal)	Service Elev. (40-80 psi)	Max. Serv. El. (25 psi static)
Main Tank #1	2.0 MG	1972	241.0	275.0	100	34.75	1,968,187	90' to 183'	217'
Main Tank #2	2.0 MG	1978	241.0	275.0	100	34.75	1,968,187	90' to 183'	217'
Smith Tank	0.25 MG	1958	271.5	302.5	38	31.5	258,755	118' to 210'	245'
Yaquina Hts. Tank	1.6 MG	1993	360.25	410.0	75	51.5	1,627,610	225' to 318'	352'
South Beach Tank	1.3 MG	1998	160.25	200.0	75	41.5	1,297,131	15' to 108'	142'
City Shops Tanks	1.1 MG	1910		219.0			1,100,000	34' to 127'	161'
				Total Maximum Existing Storage			8,219,871		

Distribution System

The City of Newport's distribution system is comprised of over 90 miles of piping and 6 booster pump stations. The City operates over nine separate pressure levels due to the variety of elevations in the system. Fire protection is provided throughout the system through over 500 fire hydrants. Hydrant coverage is good with only limited areas that have deficient spacing between hydrants.

Table 4 – Pipeline Summary

Diameter (inches)	Length (feet)	% Total
2	35,000	7.4%
3	800	0.2%
4	27,500	5.8%
6	154,000	32.4%
8	130,200	27.4%
10	23,900	5.0%
12	85,600	18.0%
14	3,300	0.7%
16	15,600	3.3%
Total	475,900 feet	
	90.1 miles	

Computerized hydraulic modeling shows that fire flows in the system are very good in most locations with isolated pockets of deficiencies. Deficiencies are generally due to undersized piping and dead end pipe runs that do not allow adequate flows to fight a typical fire. The largest area of concern is at the north end of the system.

Section 5 includes drawings of the piping network, hydrant locations and coverage, and other information on the existing system.

ES-6 Section 6 Summary – Water Demand Analysis

Section 6 describes the analysis that was completed to determine the water demand requirements for the system as well as projected future demands to the end of the 20-year planning period. The analysis includes a comprehensive review of water production and sales data to determine the amount of water that is produced versus the amount that is sold. The difference between the two amounts is defined as unaccounted water. Unaccounted water may include leakage, meter

inaccuracies, fire fighting water, and other unmetered use. The City works hard to reduce the levels of unaccounted water.

The analysis seeks to define average and peak level water demands. Figure 1 illustrates water plant production and plant run times for 2006. The figure illustrates the plant capacity limitations now being experienced with 24 hour per day run times. Current average daily demand is 2.15 mgd. Current peak days require over 4 million gallons be delivered to the system.

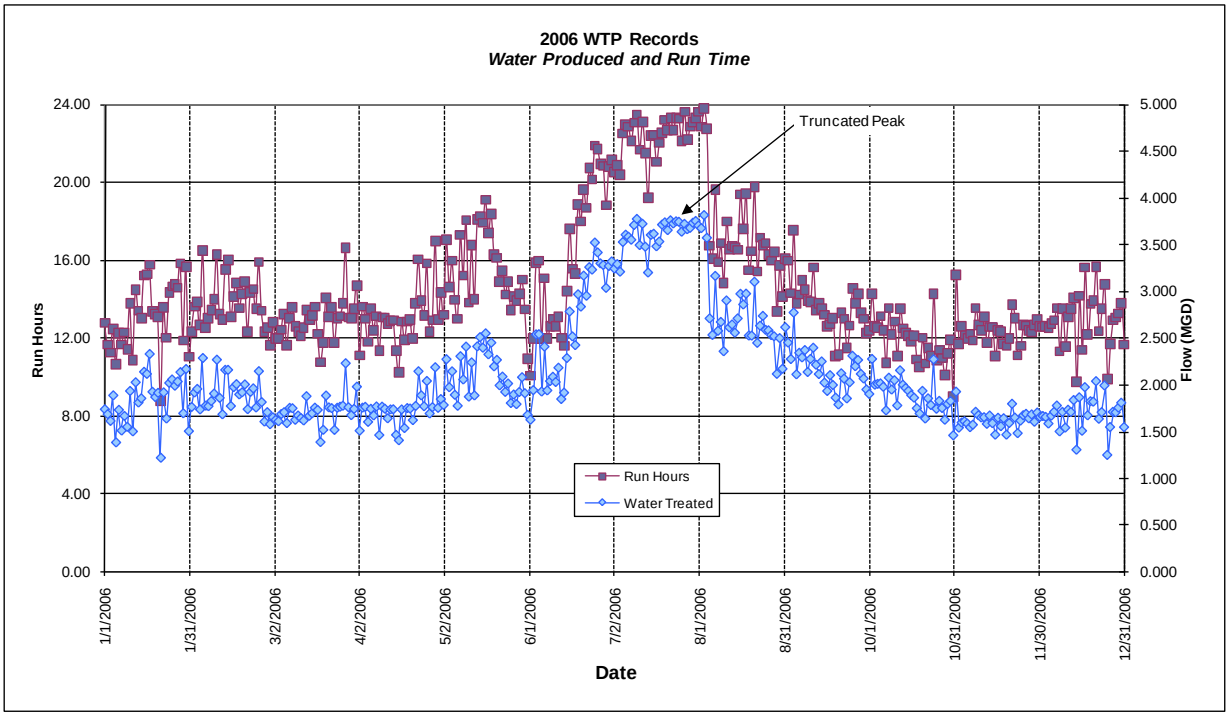

Figure 1 – Water Production and Plant Run Times

Water sales data was reviewed and compared against production data. It was determined that the City experiences unaccounted water levels on the order of 16%. This is relatively good though the current State requirement is to reduce water losses to under 15%. Those successful in meeting this goal are encouraged to reduce unaccounted levels to less than 10%.

The City sells water to a variety of customer sectors including residential, commercial, industrial, and others. The billing department keeps data on each sector's water use. Figure 2 below shows the distribution of water use in Newport.

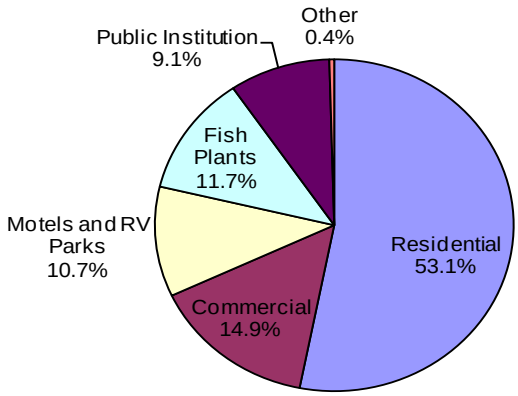

Figure 2 – Water Sales Distribution Summary by Sector

Table 5 below summarizes the water demand projections utilized in the Plan. The table illustrates the projected population and equivalent dwelling units along with the average daily demand (ADD), maximum monthly demand (MMD), maximum daily demand (MDD), and peak hourly demand (PHD) in millions of gallons per day (mgd).

Table 5 – Water Demand Projections

Year	Population	EDU	ADD (mgd)	MMD (mgd)	MDD (mgd)	PHD (mgd)
2007	10,455	11,270	2.15	3.80	4.10	8.60
2008	10,586	11,411	2.18	3.85	4.15	8.71
2009	10,718	11,554	2.20	3.90	4.20	8.82
2010	10,992	11,817	2.25	3.98	4.30	9.02
2011	11,129	12,375	2.36	4.17	4.50	9.44
2012	11,269	12,525	2.39	4.22	4.56	9.56
2013	11,409	12,676	2.42	4.27	4.61	9.67
2014	11,552	12,829	2.45	4.33	4.67	9.79
2015	11,696	12,985	2.48	4.38	4.72	9.91
2016	11,843	13,142	2.51	4.43	4.78	10.03
2017	11,991	13,301	2.54	4.48	4.84	10.15
2018	12,140	13,462	2.57	4.54	4.90	10.27
2019	12,292	13,625	2.60	4.59	4.96	10.40
2020	12,446	14,201	2.71	4.79	5.17	10.84
2021	12,601	14,368	2.74	4.84	5.23	10.96
2022	12,759	14,537	2.77	4.90	5.29	11.09
2023	12,918	14,709	2.81	4.96	5.35	11.22
2024	13,080	14,882	2.84	5.02	5.41	11.36
2025	13,243	15,058	2.87	5.08	5.48	11.49
2026	13,409	15,236	2.91	5.14	5.54	11.63
2027	13,577	15,416	2.94	5.20	5.61	11.76
2028	13,746	15,599	2.98	5.26	5.67	11.90
2029	13,918	15,783	3.01	5.32	5.74	12.04
2030	14,092	15,970	3.05	5.38	5.81	12.19

More detailed information about the planning criteria and water demand analysis can be found in Sections 4 and 6 of the master plan.

ES-7 Section 7 Summary – Alternatives and Recommendations

Section 7 describes the analysis that was undertaken for each system component to determine if a deficiency exists and, if so, what alternatives are available to remedy the deficiency. Recommendations and cost estimates are also provided in this section for all system components.

A brief summary of the alternatives considered and the recommendations made is provided below for the major system components.

Raw Water System

It was found that the existing raw water system is adequate for the planning period with slightly longer periods of pumping water from the Siletz River than is now required. In summer months when available water flow in Big Creek drops below that required by the system, Siletz River water must be pumped into the reservoirs to maintain adequate supply. Figure 3 below illustrates the water balance and relationship between monthly system demand, drought year flows in Big Creek, and the supplemental water available from the Siletz River. By pumping the maximum water right from the Siletz River (6 cfs) in June through November, the Big Creek Reservoir water levels can be maintained. The City can also choose to pump less and allow a drop in reservoir levels in later summer months when sufficient storage until rainfall is assured.

Even though current raw water supplies are adequate for the next 20 years, periods of supply problems can be expected after that time. Due to the critical nature of raw water supplies and the difficulty and expense of obtaining new water rights, the City must continue to move planning forward to solve their long-term raw water supply needs. Long-term options include the long discussed Rocky Creek Dam project, raising the height of the dam at Big Creek, constructing a dam at Valsetz, and other potential projects that would result in increased water supplies for Newport. At this time, it appears that heading toward the Rocky Creek Dam option and coordinating with other stakeholders is the most viable long-term solution.

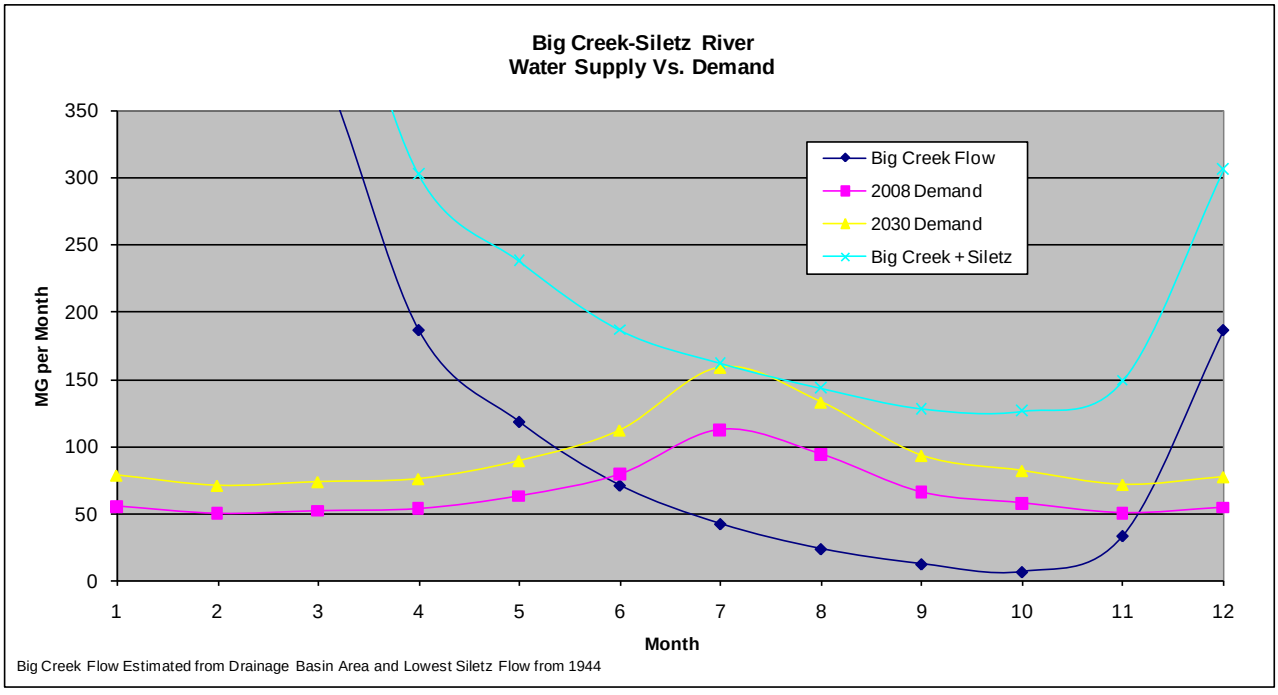

Figure 3 – Big Creek and Siletz Water Supply Balance Summary

Water Treatment System

The existing treatment plant is inadequate for current demand levels and any growth in the system will exacerbate the problems. Due to the age and condition of the facility, it was determined that expanding the plant utilizing the existing process technology was not the most prudent or financially wise option. A number of alternatives were considered including desalination, membrane treatment, and various locations for a new plant. In the end, it was recommended that the City construct a new facility at the existing site, taking advantage of some of the existing structures and components, but expanding the facility to accommodate a new membrane treatment process capable of producing 7 MGD now with the ability to expand to 10 MGD in the future.

Treated Water Storage and Distribution

The City has adequate treated water storage volume for the planning period. The distribution of that stored water throughout the system, however, is inadequate. Fire flows in the north part of the system were widely deficient and a new storage tank in that area is a more economical solution than attempting to sufficiently upsize large lengths of piping. Therefore, it is recommended that a new tank be constructed in the Agate Beach area to solve fire flow issues.

Computer modeling was utilized to develop several other projects to correct distribution problems and deficiencies related to the low fire flows, dead end piping runs, and other deficiencies.

Detailed project descriptions and cost estimates can be found in Section 7.

ES-8 Section 8 Summary – Capital Improvement Plan

The purpose of Section 8 is to summarize the recommendations developed in Section 7 into a Capital Improvement Plan (CIP). The CIP lists all the projects that are planned to improve the system over the planning period. The CIP for the City of Newport water system is summarized below in Table 6.

Table 6 – CIP Summary

Project	Description	Project Budget
T1	Big Creek Water Treatment Plant Improvements	$12,125,340
T2	Siletz River Pump Station - Pump Replacement	$642,060
T3	Upper Lake Siphon Intake	$612,540
T4	Raw Water Transmission Pipe, Dam to Plant	$1,239,840
S1	Agate Beach Lower Storage Tank - 1.0 MG GFS	$2,009,575
S2	Agate Beach Upper Storage Tank - 1.0 MG GFS	$1,740,470
S3	City Shops Tank Replacement - 1.0 MG GFS	$1,657,090
S4	King Ridge Storage Tank - 1.0 MG GFS	$2,533,740
D1	Highway 101 SE 40th to 50th Waterline, Hwy. Bore Crossing	$528,260
D2	12" Redundant Bay Crossing, Idaho Point Option	$2,333,560
D3	Highway 101 NE 36th to NE 40th Waterline	$228,780
D4	Highway 101 NE 40th to Circle Way Waterline Replacement	$509,220
D5	NE 40th and Golf Course Drive Waterline Replacement	$389,670
D6	NE Crestview Pl. to 17th Ct. Waterline Loop	$132,840
D7	NE Avery Street Loop Closure	$112,770
D8	NW 19th (Nye St. to Hwy 101) and Nye St. (18th to 20th) Waterline	$153,510
D9	Ocean View (12th to 14th) Waterline Replacement, Loop 13th to 12th	$196,160
D10		
D11	SW Coho Street (27th to 29th) Waterline Replacement	$106,270
D12	Idaho Point Waterline Replacement and Looping	$574,315
D13	East Newport Waterline Extensions	$2,096,510
D14	Water Meter Replacement - Conversion to Touch Read Meters	$1,461,240
D15	NE 5th St., Benton to Eads	$107,600
P1	Candletree Pump Station Rehabilitation	$206,640
P2	Lakewood Pump Station Rehabilitation	$187,450
	Total CIP Budget Estimate	$31,885,451

The projects listed on the CIP summary are divided into project sectors: (T) treatment, (S) storage, (D) distribution, and (P) for pump stations. The projects were organized into three priority categories to aid the City in undertaking the projects in an orderly and prioritized manner.

Tables 7, 8, and 9 summarize the priority 1, 2, and 3 project groups. Priority 1 projects should be undertaken immediately. Priority 2 projects should be undertaken over the next 5 to 10 years. Priority 3 projects should be undertaken as development patterns, deficiencies, or other project needs dictate. All projects are considered important to maintain an effective and viable water system in Newport throughout the planning period.

Table 7 – Priority 1 Projects

Project No.	Description	Project Cost
T1	Big Creek Water Treatment Plant Improvements	$12,125,340
T3	Upper Lake Syphon Intake	$612,540
T4	Raw Water Transmission Pipe, Dam to Plant	$1,239,840
S1	Agate Beach Lower Storage Tank - 1.0 MG GFS	$2,009,575
D1	Highway 101 SE 40th to 50th Waterline, Hwy. Bore Crossing	$528,260
	Total	**$16,515,555**

Table 8 – Priority 2 Projects

Project No.	Description	Project Cost
T2	Siletz River Pump Station - Pump Replacement	$642,060
D2	12" Redundant Bay Crossing, Idaho Point Option	$2,333,560
D3	Highway 101 NE 36th to NE 40th Waterline	$228,780
D5	NE 40th and Golf Course Drive Waterline Replacement	$389,670
D6	NE Crestview Pl. to 17th Ct. Waterline Loop	$132,840
D7	NE Avery Street Loop Closure	$112,770
D8	NW 19th (Nye St. to Hwy 101) and Nye St. (18th to 20th) Waterline	$153,510
D9	Ocean View (12th to 14th) Waterline Replacement, Loop 13th to 12th	$196,160
D10	0	$0
D11	SW Coho Street (27th to 29th) Waterline Replacement	$106,270
D12	Idaho Point Waterline Replacement and Looping	$574,315
P1	Candletree Pump Station Rehabilitation	$206,640
P2	Lakewood Pump Station Rehabilitation	$187,450
D15	NE 5th St., Benton to Eads	$107,600
	Total	**$5,371,626**

Table 9 – Priority 3 Projects

Project No.	Description	Project Cost
D13	East Newport Waterline Extensions	$2,096,510
D4	Highway 101 NE 40th to Circle Way Waterline Replacement	$509,220
S2	Agate Beach Upper Storage Tank - 1.0 MG GFS	$1,740,470
S3	City Shops Tank Replacement - 1.0 MG GFS	$1,657,090
S4	King Ridge Storage Tank - 1.0 MG GFS	$2,533,740
D14	Water Meter Replacement - Conversion to Touch Read Meters	$1,461,240
	Total	**$9,998,270**

Section 8 also includes an update of the City's Water System SDC Methodology to reflect changes resulting from the updated CIP. Based on the methodology update in Section 8, the City should set the new SDC for the water system to around $1,632 per equivalent dwelling unit. This is a reduction from the previous SDC assessment. The change is due to an increase in anticipated growth in the water system coupled with a funding plan for the priority 1 projects that includes utilizing GO bond funds which renders the projects to be SDC ineligible.

ES-9 Section 9 Summary – Conservation Planning

Section 9 is provided as information and recommendations for conservation planning in Newport. The Oregon Department of Water Resources (WRD) has rules in place requiring systems to develop a conservation and management plan that is designed to reduce overall water

consumption in the community and aid communities in resourceful and effective management of their water supplies.

Section 9 provides information and recommendations to the City on potential efforts and measures that they may take. However, completing a true conservation and management plan requires that the City actually make efforts, measure results, and report their effectiveness to WRD over time. A true conservation and management plan is a living and active effort that will be undertaken over many years and throughout the entire planning period.

Section 9 includes information on the management of the existing system, description of conservation measures, mandatory conservation measures, curtailment planning, and long-range water supply planning.

ES-10 Section 10 Summary – Financing and Rate Analysis

Section 10 includes an analysis of financial issues related to the Newport water system. A summary of the existing rate structures is presented along with a budget summary for the past 3 budget cycles. A brief description of potential funding sources is provided along with contact information for each program. Finally, a discussion of the funding plan for the CIP is presented. Specifically, the plan to fund priority 1 projects is to pass a GO bond measure in November of 2008. The City's finance department developed a plan that would allow funding the priority 1 projects through a GO bond that would not result in an increase in property taxes due to other bonds that are about to be retired. Figure 4 below illustrates the GO bond plan for the planning period.

Figure 4 – GO Bond Summary