Humboldt Bay Municipal Water District

Capital Improvement Plan for the Regional Water System

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Prepared By:
Humboldt Bay Municipal Water District Staff
GHD Engineers
Bartle Wells Associates

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1. INTRODUCTION

The District's original Board of Directors accomplished great things for our community – they formed a Municipal Water District, obtained funding for development of a new regional water system, completed construction of this regional system, and attracted two large industrial users who paid a significant share of the cost of this new system. The original water system was well designed and well built, and it has been well maintained over the years. It has reliably served the drinking and industrial water needs of our community since 1962. The original Board of Directors, and subsequent boards, did not establish a sinking fund or other financial mechanism to replace or upgrade the regional water system infrastructure as it aged and deteriorated. According to John Winzler, long-time District Engineer, the original Board of Directors felt they did the hard work to create the District and develop the regional water system. Mr. Winzler reported they said, "The Board of Directors governing the District 40 and 50 years hence can do the hard work to replace and upgrade it."

We find ourselves at the time and place when we need to begin that hard work, when we need to replace and upgrade our regional water system to ensure it continues to reliably meet our communities' needs.

This document presents the Humboldt Bay Municipal Water District's Capital Improvement Plan (CIP) which establishes a policy framework to identify and prioritize necessary capital improvement and replacement projects on the regional water system. It is a multi-year planning instrument intended to identify projects that will ensure the regional system reliably meets our communities' water supply needs in a cost-effective manner.

The purposes of this CIP are to:

1. Summarize the history of development of the regional water system;
2. Identify the extensive asset inventory associated with the regional water system and document its age and condition;
3. Develop policies to guide the District's infrastructure investments;
4. Identify and prioritize infrastructure projects to support the District's mission;
5. Develop a long-term CIP;
6. Develop a financial plan with options and recommendations to fund the proposed CIP projects;
7. Communicate the infrastructure needs to the District's wholesale municipal customers and the community at-large; and
8. Position the District, and possibly its municipal customers, for state and federal grant funding opportunities.

This CIP is intended to be a "living document" that will be updated based on changing needs or circumstances. It will be used to identify and communicate priorities, allocate resources, and track progress. It is also intended to guide future District budgets, and assist the District's municipal customers with their financial planning and rate studies. Most importantly, the CIP will directly support the District in its mission to reliably supply and deliver high-quality water to customers in the Humboldt Bay region.

2. OVERVIEW OF THE DISTRICT

The Humboldt Bay Municipal Water District was formed in 1956 pursuant to the California Municipal Water District Act. The District was created to develop a regional water system that provides a reliable supply of drinking and industrial water to customers in the greater Humboldt Bay area of Humboldt County.

2.1 Mission Statement

The District's Mission is to:

1. Reliably deliver high quality drinking water to the communities and customers the District serves in the greater Humboldt Bay Area at a reasonable cost;
2. Reliably deliver untreated water to the District's wholesale industrial customer(s) at a reasonable cost; and
3. Protect the long-term water supply and water quality interests of the District in the Mad River watershed.

2.2 Operations and Facilities

Current facilities and operations of the District include: 1) R.W. Matthews Dam, which forms Ruth Lake in southern Trinity County, which provides a reliable year-round water supply; 2) a hydro-electric power house at Matthews Dam; 3) diversion, pumping and control facilities on the Mad River at Essex (near Arcata); 4) storage and treatment facilities at various locations; and 5) pipeline systems that deliver treated drinking water or untreated surface water to customers throughout the Humboldt Bay region.

With respect to delivery systems, the District operates and maintains two *separate and distinct* systems to serve customers in the Humboldt Bay region:

1. An Industrial Water System, capable of supplying 60 million gallons per day (MGD) of untreated water to industrial customer(s) on the Samoa Peninsula, and
2. A Domestic Water System capable of supplying approximately 20 MGD of treated drinking water for municipal purposes.

The delivery systems are dedicated for their respective uses – in other words, the industrial system (in its current state) cannot supply drinking water.

The distinction between the Domestic and Industrial systems is important in understanding issues the District faces in regards to planning future water uses, as well as planning future capital improvement projects.

2.3 Customers

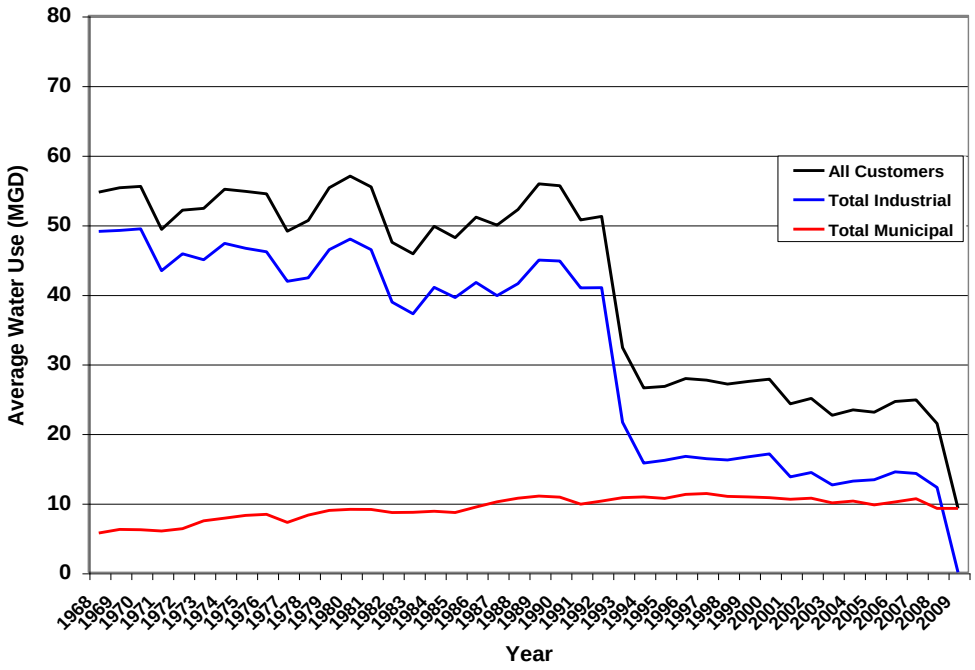
The District operates almost exclusively at the wholesale level.

The District supplies drinking water to seven public agencies who, in turn, serve the residents, businesses and industries in the greater Humboldt Bay region. The District's wholesale municipal customers are the cities of Arcata, Eureka, and Blue Lake, as well as four Community Service Districts: Fieldbrook-Glendale, Humboldt, Manila, and McKinleyville.

For almost 50 years, the District also supplied untreated water to one or two large industrial customers (pulp mills) on the Samoa Peninsula. For much of this period, the entire 60 MGD capacity of the District's Industrial Water System was under contract to the mills. During this period, the two mills regularly used 40 to 50 MGD, which was *four to five times greater* than the *total* municipal use for the entire Humboldt Bay region (Figure 1).

In the mid-1990's, the Simpson Pulp Mill ceased operation resulting in a significant reduction in District water deliveries. Shortly thereafter, the remaining pulp mill reduced its contract commitment to about half of what it had been historically. In 2009, that mill ceased operation and remains closed today with no prospect of resuming operation.

Figure 1. Annual average municipal and industrial water used (MGD)



2.4 Water Rights

The State of California via the State Water Resources Control Board (SWRCB) manages surface water resources within the state. The SWRCB accepts applications and issues permits to agencies or parties who wish to "use" water for a specific public purpose.

The District has been granted water rights permits for municipal and industrial water use. The permits allow the District to store 48,030 acre-feet of water at Ruth Lake, and then divert up to116 cubic feet per second (cfs) at its diversion facilities on the Mad River which is located 75 miles downstream near Arcata. (Note: 116 cfs = 75 MGD, the latter being the units in which HBMWD measures water delivery to its wholesale customers)

The infrastructure and facilities which comprise the regional water system, plus these water rights, allow the District to provide a highly reliable, high-quality, year-round water supply of 75 MGD.

3. CHALLENGES FACING THE DISTRICT

The key challenges facing the District are:

1. *Aging infrastructure* - Most of the regional water system is 50 years old, and although it has been well maintained, needs to be replaced or upgraded in the near future to maintain water supply reliability for the community.
2. *Loss of the industrial customer base* – The mills paid between 45% and 75% of the District's costs of operating, maintaining and improving the regional water system. Loss of their revenue contribution triggered a significant cost shift to the District's municipal customers, which in turn triggered retail rate increases in all communities.
3. *The Industrial Water System now sits idle* –At some point in the not-too-distant future, this situation must be addressed from a policy and operational perspective.
4. *Revenues* – Revenues are needed to offset the lost contribution from the pulp mills, and to fund costly infrastructure projects which are necessary over the next 10 to 20 years.
5. *Under-utilization of the District's water rights* –These water rights will be lost if not used once again.

4. PLANNING PROCESSES TO ADDRESS THESE CHALLENGES

In 2005, the Board of Directors embarked on a planning process to address long-term issues of strategic importance to the District. The goal was to ensure the long-term integrity and viability of the regional water supply and system so the District continues to meet its important service mission in our community. After much work, the Board agreed on two planning initiatives that warrant priority attention in the coming years: Water Resource Planning and Infrastructure Planning.

The two planning initiatives, while advanced independently to address specific issues above, are inextricably linked given the need to generate additional revenue and to address the idled Industrial Water System.

The Water Resource Planning (WRP) process will be briefly introduced here to summarize what the District is doing to address loss of the industrial customer base, and to illustrate the linkage between these planning efforts. Additional detail about the WRP process is available. Two key reports noted in the following section may be obtained from the District's website (www.hbmwd.com) or by calling the District at (707) 443-5018.

Following the brief introduction of the WRP process, the infrastructure planning process will be introduced, and then the balance of this document is dedicated to presenting the District's first ever CIP.

4.1 Water Resource Planning

In 2009, the Board created an Advisory Committee comprised of diverse stakeholders (municipal customers, environmental, fisheries/watershed, economic development, business/Chamber, real estate, tribal, and labor representatives). The Advisory Committee helped the District design a process to educate stakeholder groups and the community regarding this issue and its implication, and to solicit input regarding options to address loss in the industrial customer base.

The District and Advisory Committee completed a thoughtful, community-based planning process over a 15-month period. Awareness of the District's issue was raised and valuable input received from stakeholder groups and the public. The community-based planning process was praised and supported by numerous organizations locally and also at the State level, by Common Sense California.

In the fall of 2010, the Advisory Committee presented their findings and recommendations to the District in a comprehensive report titled "Advisory Committee Recommendations for Water Use Options Supported by a Community-based Planning Process." The Board of Directors accepted the Advisory Committee's report and recommendations.

The Board established three goals to guide the next phase of the planning process, the focus of which is to consider, evaluate, and then pursue new water-use options. The goals are:

1. *Protection of HBMWD's Water Rights* – Increase water use such that HBMWD maintains control of this water resource for the benefit of our community.
2. *Fiscal Sustainability* – Generate revenues to contribute to the current operation and maintenance of the regional water system, as well as to help fund the upcoming capital improvement/replacement projects.

3. *Environmental Sustainability* – Preserve the Mad River environment, and if possible, enhance it.

Given the Advisory Committee's recommendations, the Board segmented the recommended water-use options into two tiers. The District will actively consider, evaluate, and, as appropriate, pursue the top-tier options. The top-tier options are:

1. Local commercial, industrial, or agricultural water sales or any other viable water-use option within the District, such as aquaculture, as recommended by the Advisory Committee.

2. Transfer of water to another public agency outside of the District for an authorized beneficial use (e.g. municipal, industrial, environmental). Such a transfer would occur under a strictly defined contract, which protects the District's and local interests, while California water law protects the District's underlying water right.

3. Dedicating some portion of the available water for in-stream flows in the Mad River. Such water would otherwise be in storage at Ruth Reservoir for much of the year (i.e. summer and fall). This option is available pursuant to section 1707 of the California Water Code, which is intended to promote water transfers for the benefit of the environment. For such a transfer to occur there must be defined environmental benefit. This option will require studies to substantiate environmental benefit and address potential adverse effects, especially in the estuary. For consideration of this option, the District will pursue technical support and funding from Resource Agencies or other interested parties, to shield the District's municipal customers (and therefore ratepayers) from funding costly studies.

In April, 2010 the District completed a draft "Implementation Plan to Evaluate and Advance Recommended Water Use Options." The purpose of this Plan is to define activities to consider and evaluate the recommended water-use options, and to support eventual implementation. The draft plan was shared broadly with agencies, stakeholders and the public for information and to solicit input. The District held two public hearings on the draft plan in July 2011, and the Board adopted the final implementation plan in August 2011. The District is using this plan to guide implementation activities aimed at securing additional water use. *(Reference: Implementation Plan to Consider, Evaluate and as appropriate, Advance Recommended Water-Use Options, adopted August 11, 2011).*

4.2 Infrastructure Planning

In 2006, this planning process was initiated by District staff. The District's Engineer (Winzler & Kelly Consulting Engineers) was engaged to support the planning process and complete several activities. In 2010, District staff, in partnership with Winzler & Kelly, developed a series of project recommendations. That same year the District retained Bartle Wells to develop a financial plan and formulate financing options and recommendations.

In summary, this planning process involved the following activities:

a. Summarizing the history of development of the regional water system, as well as the design capacity of key components. This information was collected and is presented for the benefit of future staff and Board members.

b. Creating an extensive asset inventory associated with the regional water system, documenting its age, and assessing its condition.

c. Researching how other agencies developed their CIP's and consulting other resources to guide development of the District's plan.

d. Developing a policy framework to guide the District's infrastructure projects and investment. This policy framework was approved by the Board of Directors in October 2007.

e. Identifying and prioritizing a series of projects to support the District's mission given the policy framework.

f. Developing a financial plan for the District given the proposed projects

g. Formulating financing options and recommendations.

h. Creating a written CIP to document this work, present the findings and recommendations, and to support future annual budgets.

The results of this comprehensive planning effort are presented in the following chapters:

Chapter	**Topic**
5.0	History of Development of the Regional Water System
6.0	Components and Capacity of the Regional Water System
7.0	Water Rights
8.0	Maintenance Practices
9.0	District's Mission and Goals and Relationship to CIP
10.0	Policy Framework for Infrastructure Planning
11.0	CIP – Development of the Plan
12.0	CIP – Results and Proposed Projects
13.0	Wholesale Contracts and Implications for CIP
14.0	Financial Plan
15.0	Next Steps

5. HISTORY OF DEVELOPMENT OF THE REGIONAL WATER SYSTEM

Construction of the original regional water system commenced in 1960 and was completed in 1962. The initial phase of development included: 1) Ruth Dam, which forms Ruth Lake (now known as R.W. Matthews Dam, in honor of the District's first President, Robert Matthews); 2) diversion, pumping and control works on the Mad River at Essex (now known as the John R. Winzler Operations and Control Center, named in honor of John Winzler, who served as District

Engineer for over 45 years); and 3) a pipeline delivery system to supply the City of Arcata, the City of Eureka, and two pulp mills planned to be sited on the Samoa Peninsula, near Fairhaven. Since construction of the initial system, a number of additions and improvements to the regional water system have been completed over the years.

Following is a brief chronological summary of the development of the regional water system. As noted above, John Winzler has served as District Engineer for over 45 years. During his tenure with the District, he has written several historical accounts of the District and development of the regional water system. One such account written in1979 is titled "A History of Water Development and Service Within the Humboldt Bay Area (1955–1979)". A second account titled "Water Rate Evaluation-Historical Evolution of District Facilities and Capital Expenditures" was written in 1984. Below, the historical accounts between 1960 and 1984 are excerpted from these papers written by Mr. Winzler.

5.1 Original Regional Water System (1960-1962)

Ruth Reservoir

"Based on initial contracts (Basic Contracts) with the two pulp companies–which called for each mill purchasing 12.5 MGD, with the option of purchasing an additional 6.5 MGD, for a total of 19 MGD – the District proceeded to construct the dam and reservoir at Ruth with an agreed capability of augmenting the natural river regimen to 75 MGD for diversion at Essex."

Construction work on the dam commenced in September 1960 and was completed in late 1961. Water flowed over the spillway for the first time on February 16, 1962.

Diversion and Collection

"At Essex, in 1962, diversion facilities were constructed which incorporated four (4) Ranney collectors (only three of which were completed); the interconnecting pipeline facilities; a control building and appurtenant facilities".

The diversion facilities had a design capacity of 53 MGD (38 MGD for the pulp mills and 15 MGD for municipal uses).

The Ranney system of water collection and diversion was perfected in France and the system was patented. Licenses to use the system were franchised to several firms in the United States. Bechtel Corporation prepared the plans and specifications for development of the four Ranney collectors in the original project. They received bids from two companies – Ranney Method Water Supply Inc. of Columbus, Ohio and Ranney Method Western from California. The contract was awarded to the low bidder, Ranney Method Water Supply from Ohio. However, Ranney Method Western claimed they had the sole license for this type of work in the western United States, and subsequently filed suit in

federal court. Ranney Methods of Ohio started work on Collector 1, but following the court proceedings, they defaulted on the contract, and Ranney Methods Western was brought in to complete the project.

Shortly after Ranney Method Western assumed the contract and completed Collector No. 1, the District put them and the surety company on notice that the required water quality standards were not being met. Litigation ensued but a settlement was reached - Ranney Method Western needed to take whatever activities were necessary to cure the deficiencies. When Ranney found that two of the laterals brought turbid water into the collector, they sealed them off; however, they were then not able to meet the required delivery quantity. To compensate, Ranney proposed development of Collector 1A with a connecting siphon to Collector 1. Ranney Methods Western completed Collector 1A and the siphon in the spring of 1964.

Pipeline System

"The transmission pipeline was divided into two sections: Essex to Alliance (Arcata's service point), and Alliance to Fairhaven. This was done because the District wanted to upsize the Bechtel pipeline design from 42" diameter to 51" diameter from Essex to Alliance to provide future capacity. The pulp companies would not agree to participate in this extra expense, and the line has sufficient capacity to sustain 75 MGD, so it was dealt with as a separate facility."

The 51" pipeline from Essex to Alliance had a design capacity of 75 MGD. The 42" pipeline from Alliance to Fairhaven had a design capacity of 42 MGD (i.e. 38 MGD for the two pulp mills and 4 MGD for future municipal use).

The original transmission system from Essex to Samoa was designed such that the pipeline pressure at the terminal point (which was the meter building for the pulp mills) was supposed to be at sea level. A 90' high surge tower was constructed near this terminal point. Pressure at this terminal point of the transmission system was intended to control the control system, which operated the pumps in the collectors; however, it did not work as designed by Bechtel. The surge tower was sealed off and is no longer used.

The total cost of the original system infrastructure was $13.8 million, which was funded by the 40-year General Obligation bonds authorized by a vote of the electorate in 1956.

5.2 Supplemental Water Project (1966)

"When the mills began to plan their facilities, they became cognizant of a need for more water and they each requested an additional 11 MGD, for a maximum of 30 MGD each. We (Winzler & Kelly and Kennedy Engineers) did not believe that the Ranney system could generate the flows needed and still provide filtered water -- thus the Supplemental

Water Project envisioned modifying and finishing Collector 3; modifying Collector 4 and building Collector 5. Collectors 3, 4 and 5 would develop only partially filtered water to be transmitted directly to the mills. The Supplemental Project entailed separating the domestic water supply (Collectors 1 and 2) and providing a separate water line to Fairhaven which would have a capacity of 4 MGD (the unused capacity of the original system) at Fairhaven as well as providing Arcata's water needs. The Supplemental Project also included a parallel leg of 42" diameter line to aid the hydraulic capacity of the system and allow the delivery of 60 MGD to the pulp companies."

The Supplemental Project separated the industrial water supply from the domestic water supply and added an additional 22 MGD to the collection and diversion capabilities, as well as the transmission capabilities of the District. The total cost of this project was $5.9 million. Since the mills were the beneficiaries of this project, they paid the entire cost. An Improvement District was formed to facilitate issuance of bonds for the project.

5.3 Subsequent Additions to the Regional Water System

South Bay Water Extension (1970)

"The next major capital improvement project was the South Bay Water Extension Project, which, while initiated in 1968-69, was implemented in 1972, with the aid of an EDA grant for a portion of the capital costs." This project extended the District's domestic water pipeline from Fairhaven down the Samoa Peninsula, and installed an underbay pipeline to serve the Humboldt CSD. The District's pipeline terminates at Humboldt CSD's Truesdale Pump Station. The total project cost was $1.95 million, with half of that funded by the Federal Government via an EDA grant.

Water Line Extension to Blue Lake and Fieldbrook (1974)

Extensions of the District's domestic water pipeline to serve the Fieldbrook Community Services District and the City of Blue Lake were completed in 1973 and 1974. The cost of these extensions was $291,400.

Industrial Direct Diversion – Pump Station 6 (1976)

"The Direct Diversion Facility was initiated because of certain contractual language in both the Basic Agreement (1959) and the Supplemental Agreement (1966) which provided that the pulp companies would not have to pay for any water that was unavailable because of facility deficiencies after July 1, 1977. Thus, because the Ranney collectors had proven to be insufficient as to providing the necessary pulp mill contractual delivery requirements (i.e. 30 MGD each), the District was forced to proceed with the necessary capital expenditures for a diversion facility capable of supplying 60 MGD." The facility was completed in 1977 at a total cost of $5.7 million. Just over half of it was funded by the Federal Government via the EDA grant program. (*Note: This direct diversion facility is*

commonly called Pump Station 6, and is named the Hilfiker Pump Station in honor of long-time Director Harold Hilfiker.)

Hydro-electric Plant (1983)

In 1982 and 1983, a hydroelectric facility was constructed below Matthews Dam at Ruth Lake. The total project cost was just over $3 million. At the time, annual revenues were projected to be in excess of $450,000, but that did not materialize. *(Note: This facility is named the Gosselin Hydro-electric Plant in honor of long-time Director Tony Gosselin.)*

Samoa Booster Pump Station (1996)

In 1996, the Samoa Booster Pump Station was constructed for the domestic water pipeline on the Samoa Peninsula. The purpose of this pump station was to provide a more consistent delivery pressure to Humboldt CSD at their Truesdale Pump Station. Due to demands of upstream users and the fact that the domestic pipeline on the peninsula contains long sections of smaller-diameter pipe (15" and 18") as compared to the rest of the pipe, the suction pressure at Truesdale was fluctuating significantly. This fluctuation made it impossible for Humboldt CSD to take their then-current contract amount of 1.9 MGD. The pump station remedied this situation and also increased the delivery capability of the domestic pipeline system south of the pump station by approximately 0.5 MGD. The cost of this new pump station was $391,000.

Drinking Water Treatment Additions ("CT" Tank 1997; TRF 2003)

The next additions to the regional water system were triggered by safe drinking water regulatory requirements. Congress passed the Safe Drinking Water Act in 1974 to protect the public from harmful contaminants in drinking water. In accordance with the Act, the U.S. Environmental Protection Agency (US EPA) established regulatory standards to protect public health. Two types of drinking water standards were established:

1. "Primary" standards are for micro-biological and chemical contaminants that may be found in drinking water and may have adverse health effects on humans. The maximum allowable concentration is called the Maximum Contaminant Level (MCL). The "Primary" standards are mandatory and must be complied with by all Public Water Systems.

2. "Secondary" standards are for contaminants which do not pose a health threat, but do affect the taste, odor, or appearance of water. Secondary standards establish recommended, but non-enforceable MCLs.

The California Department of Health Services (DHS), Division of Drinking Water, regulates drinking water in accordance with federal US EPA regulations and standards, and also enforces federal drinking water standards in California.

(Note: Effective, July 1, 2007, the DHS name was changed to the California Department of Public Health (DPH). The Division of Drinking Water remains. In the following paragraphs, DHS is used to recognize historical accounts and correspondence with the Department, but any prospective references to the Department will be abbreviated DPH).

In 1986, Congress amended and reauthorized the Federal Safe Drinking Water Act. This triggered a significant amount of work during the 1990s with DHS and the District's seven wholesale municipal customers.

DHS initially classified the District's source water as "groundwater under the influence of surface water" as they did for most systems. (Reference*: Surface Water Influence Determination for HBMWD's Ranney Collector Source, October 1991)*. From a regulatory perspective, this classification required that the District, and its seven wholesale municipal customers, comply with the newly-adopted federal Surface Water Treatment Rule (SWTR). In July 1993, the District entered into an agreement with DHS to comply with the new SWTR regulations. The District, with support of its wholesale municipal customers, retained Kennedy/Jenks Consultants to conduct a pilot plant study, followed by feasibility-level design, for a SWTR-compliant treatment plant (which at the time, based on the feasibility-level design, was estimated to cost $15 million).

However, following an extensive evaluation of the District's source water in the mid-1990s, first by Kennedy/Jenks Consultants and then by the DHS, the State re-evaluated the District's source water classification. *(*Reference*: Particulate and Microbial Analyses of HBMWD Surface and Groundwater Sources, August 9, 1994).* DHS reclassified the District's source water from "groundwater under the influence of surface water" to "groundwater" *(*Reference*: Response to HBMWD request for reevaluation of Ranney Collector source classification as "groundwater under the direct influence of surface water," August 23, 1994)*. In September 1994, DHS rescinded the compliance agreement requiring compliance with the SWTR regulations. In conjunction with this change, DHS required enhanced disinfection procedures and additional monitoring requirements. To comply with the enhanced disinfection requirement, the District agreed to construct a new domestic water reservoir to increase the "contact time" of the drinking water with the disinfectant. In 1997, the District constructed a 2 MG, baffled reservoir to meet this water quality objective. The cost of the new reservoir was $1.2 million.

The Ranney collectors have consistently produced drinking water of very high quality: the "Primary" regulatory standards (which protect public health) have consistently been met. However, one "Secondary" standard that the District's source water periodically did not meet was turbidity. Turbidity is the suspended solids in the water comprised of tiny matter such as clay or organic debris. Turbidity does not have a "Primary" standard, as it does not pose a threat to public health. However, turbidity may affect the aesthetics of drinking

water, so the US EPA established a "Secondary" standard of 5 ntu (ntu being the units in which turbidity is measured).

Water drawn from the Ranney collectors occasionally exceeded the "Secondary" turbidity standard of 5 ntu during or immediately after severe storm events. After a series of severe winter storms in late 1996, the turbidity in the drinking water reached levels not previously seen (about 50 ntu). DHS became concerned that elevated turbidity levels could potentially interfere with the disinfection process, and therefore, pose a threat to public health. On January 1, 1997, DHS ordered the eight Public Water Systems (the District and its seven municipal customers) to issue a precautionary boil water notice to the community to ensure protection of public health. DHS also requested that the District and its municipal customers explore ways to address the occasional high winter-time turbidities. Later that same year in May 1997, DHS reported that high turbidity may interfere with disinfection and mandated that turbidity reduction facilities be built to "avoid a DHS compliance order."

In response to DHS' mandate, the District created the Water Quality Task Force, comprised of staff and elected representatives from the District and each of its municipal customers, to explore options to address this mandate. Through a collaborative process with the District's municipal customers and the DHS, a new regional treatment plant was recommended, as opposed to separate plants for each agency. *(Reference Water Quality Task Force Final Report, April 18, 1999)*

Kennedy/Jenks Consultants, with civil support from Winzler & Kelly, designed the new treatment plant, which is called the Turbidity Reduction Facility (TRF). Construction commenced in 2001 and was completed in April 2003. The cost of the TRF was $10.5 million, and it was financed by a zero-interest, 20-year, Safe Drinking Water State Revolving Fund Loan. *(Note: The TRF was dedicated and renamed the Lloyd L. Hecathorn Turbidity Reduction Facility, in honor of Lloyd Hecathorn, the Director with the longest tenure over 24 years.)*

Emergency Power Generator at Essex (2003)

The final infrastructure addition, as of this writing, is a 2 megawatt emergency power generator at Essex, with associated transformer and automatic switchgear. The generator is sized to provide power for all pumping, control, and ancillary services at Essex during a power outage. The generator project was completed in 2003 at a cost of $787,000. In addition to improving supply reliability, the generator has more than paid for itself given its use to get off the PG&E power grid during the summer peak season for two years, and given participation in PG&E's E-BIP demand response program.

6. COMPONENTS AND CAPACITIES OF REGIONAL WATER SYSTEM

6.1 Water Supply

Overview:

R.W. Matthews Dam is an earth-filled dam which forms Ruth Lake. It impounds runoff from the upper quarter of the Mad River Basin, an area of approximately 120 square miles. The spillway crest elevation is at 2,654 feet, at which point the capacity of Ruth Lake is 48,030 acre-feet. The maximum pool elevation is at 2,678 feet, 24 feet above the spillway crest.

A portion of the water stored in Ruth Lake is released each summer and fall to satisfy the District's downstream diversion requirements at Essex, and the minimum bypass flow requirements below Essex (as established by the Department of Fish and Game, and the State Water Resources Control Board, and as incorporated into the District's approved Habitat Conservation Plan for its Mad River Operations).

Safe Yield of Reservoir:

Bechtel Corporation was retained in the 1950s (first by Humboldt County and then by the District, after its formation) to perform various water supply studies and complete the design and specifications for the original regional water system. During this time, Bechtel completed a detailed operations study of the reservoir storage to determine the safe yield of the original project pursuant to the District's downstream diversion requirements and the requirements in the District's water rights permits. The study was done on the basis of a 75MGD average annual diversion rate at Essex. Existing prior water rights downstream of Ruth Lake were incorporated into this study. Bechtel confirmed the safe yield of the reservoir to be 75 MG, assuming the driest period of record they studied (1923-1924). Bechtel reported "The Mad River Development will utilize the available supply and by storage regulation make this supply available for year-round diversion at Essex. The firm supply made available at Essex is measured by the amount of water the District can divert under its permits in the driest year on record 1923-1924." *(*Reference: *Engineering Report on Mad River Development-Feasibility of Supplying Filtered Water to Municipal and Industrial Customers, Bechtel Corporation, October 1960)*

Subsequent to Bechtel's operations study, the State Department of Water Resources calculated the safe yield of Ruth reservoir to be very close to what Bechtel had determined *(Reference: Bulletin No. 142-1, North Coastal Hydrographic Area).* The State also used the 1923-24 drought period in its determination.

The drought of 1976-1977 was extreme, impairing the ability of the District to meet its then-current contractual commitments of 75 MGD to its municipal and industrial customers. Winzler & Kelly Consulting Engineers performed a study for the District comparing the natural runoff during the 1976-77 drought to the runoff used by Bechtel in their operations study (using the 1923-24 drought period). The summer flows of the two drought cycles were

fairly similar. However, the winter flows of December, January, and February of 1976-77 were significantly lower than experienced during the 1923-24 drought. Consequently, the winter recovery of the reservoir which was computed to occur during the 1923-24 drought cycle did not actually occur in the 1976-77 drought, resulting in a lower available yield during the summer and fall of 1977. Winzler & Kelly estimated that the total storage requirement to maintain the 75 MGD safe yield assuming the 1976-77 conditions would be 59,100 acre-feet (11,070 acre-feet more than the current storage capacity). They also concluded that the apparent yield of the existing 48,030 acre-feet reservoir to be 67 MGD, which is 8 MGD less than Bechtel's computed safe yield. (Reference*: Matthews Dam Drought Deficiency Analysis June 1976 – November 1977, Winzler & Kelly Consulting Engineers)*

Implications of the safe yield analyses are very important with respect to: 1) policy decisions regarding the firm yield of the reservoir, and 2) future contractual commitments the District will make with its current or future customers. The District should carefully consider this matter if and when supply requests and/or customer commitments approach the safe yield of the reservoir, or if hydrological conditions fundamentally change in the Mad River Watershed.

Future Supply Development If and When Necessary:

The original design concept for Ruth Dam included two phases of development. The phased approach was intended to supply the water needs of the system as it developed, and as the water demands within the community increased over time. The District's original water rights applications to the State, and the permits received from the State, reflected the two phases of development at Ruth Lake and the diversion at Essex.

Phase I development created Ruth Lake as it exists today (e.g. a 48,030 acre-feet reservoir). Bechtel originally designed and estimated the volume impounded by the Phase I development to be approximately 50,000 acre-feet. This volume was subsequently adjusted to the current capacity of 48,030 acre-feet based on the results of cross-sectional surveys.

Phase II development called for an enlargement of Ruth Dam to increase the storage capacity to 120,000 acre-feet, more than doubling the Phase I capacity. This was to be accomplished by raising the spillway crest elevation by 43 feet to an elevation of 2,697 feet.

It should be noted that the Master Lease Agreement between the District and Trinity County (which was later assigned to the Ruth Lake CSD) reflects this two-phased development approach. The Master Lease governs recreational development around Ruth Lake. It also specifies numerous rights and protection of the District's water supply interests. The Master Lease explicitly allows for expansion of the District's water supply in the future. It specifies that: 1) the primary purpose of the District's facilities at Ruth is for impounding water; 2) the level of the lake shall be maintained at levels the District, in its sole discretion, deems advisable; 3) the District reserves the right to change the level of the lake whether to the

detriment of Trinity County or to its subtenants without prior notice; and 4) the District may at any time in the future increase the lake level to a stage which may or may not inundate or impair facilities of Trinity County or their subtenants.

In 1967, Winzler & Kelly Consulting Engineers and Kennedy Engineers completed a study to determine the requirements to enlarge Ruth Dam to meet additional capacity requirements. The study was based on modifying the existing dam and raising the clay core and surrounding embankment in two stages. The study concluded that R.W. Matthews Dam could be enlarged such that the new dam crest elevation would be 2,707 feet, with a maximum pool elevation of 2,699 feet, and spillway crest elevation would be 2,675 feet. This enlarged dam would impound 79,100 acre-feet of water, a 65% increase compared to the current Phase I development.

Context of District Operation in Mad River Watershed:

As mentioned above, a portion of the water stored in Ruth Lake is released each summer and fall to satisfy the District's downstream diversion requirements at Essex, as well as minimum bypass flow requirements below Essex. Although the District impounds water at Ruth Lake and diverts water at Essex, the operations do not significantly affect the natural flow regime in the Mad River. There are several reasons for this, as follows:

1. The total volume of water impounded and diverted represents a small percentage of the natural yield of the Mad River Watershed. The Mad River's average annual discharge into the Pacific Ocean is just over 1,000,000 acre-feet. Ruth Lake, in its entirety, represents less than 5% of the total average annual runoff from the Mad River Basin. The entire 48,030 acre-feet is not drawn down each year, so the amount of winter-season runoff captured in the reservoir is yet a smaller percentage of the total runoff. With respect to diversions, the current withdrawal rate at Essex is approximately 25 to 30 MGD (28,000 to 34,000 acre-feet per year), which is only 3% of the total annual average runoff of the Mad River Watershed. The full diversion capacity of 75 MGD (84,000 acre-feet per year) is just 8% of the total annual average runoff of the watershed.

2. Tributaries downstream of Matthews Dam contribute significantly to, and are a major influence on, resulting flow rates in the Mad River. A former USGS gage station near what USGS called "Forest Glen" (No. 11480500) was located nine miles below the dam prior to the confluence of any major tributaries. Annual mean flow at the Forest Glen gage station increased by an average of 22% compared to the mean flows just below Ruth Lake. The more significant tributaries on the Mad River are located downstream of this former gage station. These tributaries contribute significantly to Mad River discharge, and also provide a "buffering effect" during the few times the District is releasing less than the natural flow from Ruth Lake (e.g. during first few winter storms).

3. There are no out-of-basin transfers in the upper watershed, as occurs on some river systems. The District releases water down the mainstem Mad River channel. The District's flow releases augment flows compared to what otherwise occurred naturally during the summer and fall. Flow augmentation has many beneficial effects, including expanding river habitat for the benefit of aquatic species. This benefit was addressed and acknowledged in the District's Habitat Conservation Plan for its Mad River Activities.

6.2 Hydro-electric Plant

The District's hydro-electric plant has two one-megawatt turbine generators, thus a rated capacity of 2 megawatts. Power production is almost exclusively associated with water released for the District's water supply operation. Annual average production is approximately 5.4 million kilowatt hours (kwh), but can vary greatly based on hydrological conditions. For example, it has been as low as 3.0 million kwh and as high as 6.9 million kwh. *(*Reference: *District Operating data, 1984-2005)*

The District has a Power Purchase Agreement with PG&E to sell "as available" energy and capacity. This contract is limited to 1,300 kw of capacity given constraints on PG&E's system. The District does know if the constraint on PG&E's system still exists.

The District holds a separate water rights permit for its hydro operations. Like the District's original water rights permits for storage at Ruth and diversion at Essex, the District's application and subsequent water rights permit assumed two stages of development of the hydro-plant. Phase 1 is for the current project development (i.e. the 2 megawatt hydro-plant). Phase 2 assumed another penstock to capture water that otherwise spilled, and an additional 2 megawatts of installed generation capacity.

The hydro water rights permit expired in December 2010. The District conducted an extensive analysis of two options: request a license for the Phase 1 capacity of the plant (2 megawatts) versus request another extension of time and pursue the Phase 2 development. Given the results of the analysis, and risks associated with an extension request, the District decided to petition the SWRCB for a license. The District determined the following attributes of the license which should be established by the SWRCB when they complete their inspection (which they stated may take ten years to complete):

1. Season of Diversion for Direct Diversion: January 1 through December 31
2. Season of Diversion for Diversion to Storage: October 1 through April 30
3. Withdrawal from Storage Amount (max. yearly withdrawal): 30,420 acre-feet
4. Maximum Diversion Rate: 250 cfs (based on max. 14-day average)

5. Total Water Use through the Turbines: 119,634 acre-feet by Calendar Year and 113,697 acre-feet by Water Year
6. Diversion to Storage Amount: 48,030 acre-feet (actual storage capacity of Ruth Reservoir at spillway elevation 2,654 ft)

*(*Reference: *Summary of Hydro Power Water Rights Analysis, July 9, 2010, and Letter to State Water Resources Control Board Requesting a License, November 24, 2010)*

6.3 Diversion and Pumping Works

Domestic System

As discussed in Chapter 5 (History of Development), the District installed five Ranney collectors in or adjacent to the Mad River during the 1960s. The collectors draw water from the aquifer below the Mad River via perforated 12"lateral pipes located approximately 60' to 90' beneath the bed of the river. The process of drawing water from the aquifer below the river bed provides a natural filtration process, which results in water that is very high in quality.

Currently, four Ranney collectors are operational. They supply water to the District's domestic system for drinking water purposes.

In 1995, the District abandoned (decommissioned) Ranney Collector No. 5. This collector was originally constructed to pump industrial water to the pulp mills commencing in 1966. When Station 6 (the direct diversion facility) was built in 1976 to supply industrial water to the mills, Collector 5 was retrofitted to supply domestic water. However, "due to low production, water quality, and having four redundant domestic water pump stations, Pump Station 5 was used very sparingly during the following ten years." *(*Reference: *September 29, 1994 letter from Dale Stoveland, District Superintendent, to Eugene Parham, DHS)*

Three collectors (No. 2, 3, and 4) house two 350 hp pumps driven by electric motors. One collector (No. 1) houses two 350 hp pumps and two 200 hp pumps, each driven by electric motors. Each collector is capable of pumping approximately 4-6 MGD for a total production capability of 20 to 21 MGD.

Industrial System

Hilfiker Pump Station No. 6 was constructed in 1976 to supply industrial water to the pulp mills. It is a "direct diversion" facility capable of pumping 60 MGD. Station 6 is comprised of a forebay, which is directly adjacent to the Mad River, transverse to the direction of flow, and a concrete structure which houses the pumps. A shear wall of removable concrete panels across the entrance of the forebay reduces the amount of debris entering during high flows. Steel sheet pile structures make up the forebay sidewalls.

The concrete intake structure is divided into two equivalent "pumping bays", which provides redundancy, and, therefore, supply reliability. Each "bay" houses three large pumps (two 700 hp and one 200 hp) with electric-driven motors. Station 6 has a separate dedicated utility power system. An inclined trash rack at the entrance to the structure protects each pumping bay by removing woody debris that ends up in the forebay. A mechanical, motor-driven rake cleans the racks. Each bay has a mechanically operated fish screen located 12' in front of the pumps.

6.4 Treatment

Drinking water from the Ranney collectors is chlorinated at Essex, in accordance with drinking water standards, and then pumped to Korblex. During the winter, the water is processed and filtered by the TRF in accordance with standards established by the DHS. The TRF consists of an in-line gravity filtration process. The facility is comprised of the following components:

- Rapid Mix Station;
- Filter Building;
- Chemical Building;
- Backwash Pump Station;
- Washwater Recovery Basins;
- Sludge Drying Beds,
- A filter process to return all filter-waste water to the head of the plant for reuse.

During design, the TRF was sized to supply existing demands, including a 10% increase in capacity to meet anticipated future demands. The extent to which capacity could be increased above current needs was limited by the State's SRF loan for the project. The TRF has been designed with a hydraulic capacity of 21 MGD (to match the production capability of the Ranney system). However, the winter-time design capacity is 14 MGD. This wintertime design capacity is based on several conservative assumptions: 1) a very high influent turbidity; 2) one filter out of service in its backwash cycle; and 3) a resulting high filter loading rate of 6 gallons per minute per square foot (GPM/ft^2) over the five available filters. The plant can and will operate at flow rates higher than 14 MGD, potentially up to 21 MGD, depending on the source water quality, on whether all six filters are available for operation, and on the resulting filter loading rate.

Following treatment-chlorination year-round and turbidity reduction in the winter-the finished drinking water flows through two storage tanks. First is the 2 MG baffled storage tank to achieve the required contact time. Second is a 1 MG tank which supplies water to the transmission system, which, in turn, serves the District's municipal customers.

6.5 Transmission System

The District operates two separate and distinct distribution systems to deliver water to its customers throughout the Humboldt Bay region: an Industrial water system and a Domestic Water System.

The Domestic Water System starts at the 1 MG tank at Korblex and delivers treated drinking water to the District's seven wholesale municipal customers and to approximately 180 retail customers served directly by the District.

The Industrial Water System starts at Essex and delivers untreated water to wholesale industrial customer(s) on the Samoa Peninsula. The Industrial System terminates at a 1 MG industrial water reservoir located near the industrial meter building.

The transmission system is comprised of over 35 miles of pipeline, ranging in size from 6" to 51" diameter.

The District currently has one booster pump station on the distribution system - the Samoa Booster Pump Station on the 15" Domestic Water System on the Samoa Peninsula. The station includes two variable speed pumps with electric-driven motors. One pump is 100 hp and the second is 200 hp. The total capacity of the domestic pipeline system downstream of this booster station is approximately 4.4 MGD (3,050 GPM). The station was designed to accommodate two operating modes. The first mode provides the required delivery pressure to Humboldt CSD at Truesdale over a flow range of approximately 1,800 GPM to 2,300 GPM. The second mode is intended to provide the required delivery pressure at Truesdale over a higher range of flows, approximately 2,300 GPM to 3050 GPM. *(*Reference*: 10% Design Report for Samoa Peninsula Booster Pump Station, Winzler & Kelly Consulting Engineers)*

6.6 Distribution System

In 1972, the District formed Improvement District A. The purpose of the Improvement District was to extend water service to the community of Fairhaven on the Samoa Peninsula, given persistent requests from the Fairhaven Fire District (now called Samoa Peninsula Fire District). Following the formation of Improvement District A, the District constructed a water distribution system, including fire system, within the town of Fairhaven, and connected this distribution system to the District's transmission pipeline on the peninsula. The estimated the cost of completing this project was approximately $100,000. Improvement District A was dissolved in June, 1986. This water distribution and fire protection system in Fairhaven is the only distribution system owned and operated by the District.

(Note: The District provides operational, maintenance, and retail account services to the Fieldbrook-Glendale CSD on a contractual basis. Fieldbrook-Glendale CSD is a special district, its own legal and political entity, with all infrastructure the assets of that District).

6.7 Other Components

The District has extensive electrical, communication, and supervisory control systems to support and operate the regional water system. The District has emergency power generators at key facilities to improve supply reliability, as well as an extensive inventory of mobile assets, fixed assets, and tools to support the operation and ongoing maintenance of the regional water system.

6.8 Summary

The regional water system has reliably served the drinking and industrial water needs of our community since 1962. The infrastructure associated with the "original project" is now 50 years old and the infrastructure associated with the "supplemental project" is 45 years old. This infrastructure forms the backbone of the regional water system. It was well-built and has been well maintained, but it needs to be addressed to ensure continued reliable operation into the future.

7. WATER RIGHTS

7.1 Overview of District's Water Rights

On July 7, 1955 and September 21, 1956, the District applied to the State Water Rights Board for water rights permits to supply the new regional water system. The District filed applications 16452 and 16454 which proposed two phases of development. Phase 1 proposed 50,000 acre-feet of storage to be initially developed at Ruth Reservoir, followed by a subsequent Phase 2 development, which would expand the capacity of Ruth Reservoir to 120,000 acre-feet and increase diversions at Essex.

Two permits were issued by the State Board on March 16, 1959 (Permit Nos. 11714 and 11715). One permit appropriated 100,000 acre-feet per annum (afa) of storage. The second permit appropriated an additional 20,000 afa of storage and 200 cfs of direct diversion year-round (Note: 200 cfs = 129 MGD). The original permits specified that construction work shall be completed by July 1, 1967, and that complete application of the water shall be made by July 1, 1970. In 1981, the State Board established the maximum amount to be appropriated under both permits (a process they were doing for all permittees) and they established the maximum *annual* amount under both permits to be 253,000 acre-feet. *(*Reference*: December 18, 1981 letter from the State Water Resources Control Board titled "Permits 11714 and 11715 (Applications 16454 and 17291) Mad River in Trinity County".)*

Between 1970 and 2000, the District applied for, and was granted, three successive ten-year extensions of its original water rights permits, thereby allowing additional time to put the appropriated water to "full beneficial use." During that time period, it was quite common, as well as relatively easy, to acquire a 10-year extension from the State Board.

That was no longer the case when the District began work on its fourth permit extension request, prior to the permits expiring in December 2000. Two circumstances had changed. First, the Simpson Pulp mill, which had contracted with the District for 30 MGD of water, ceased operation in the mid-1990s. This resulted in a significant reduction in the District's total water deliveries. Second, the SWRCB was adopting new policies to address the State's significant water resource issues. They adopted much more stringent requirements for a permit extension, including preparation of a CEQA document, and they evaluated extension requests much more critically than they had before.

The District originally submitted an application to extend both permits (which included Phase 1 and Phase 2 development) for another ten years. That did not turn out to be a tenable position. Following consultation with Division of Water Rights staff and legal counsel, the District decided to amend its permit extension request. The District requested a 25-year permit extension (vs. the customary 10 years), for Phase 1 development only, and revocation of its Phase 2 development rights. As introduced above, Phase 2 would have increased storage under permit from the existing 48,030 acre-feet to 120,000 acre-feet, and diversion from the current 116 cfs to 200 cfs.

On August 26, 2004, the SWRCB issued Order WRO-2004-0038 which approved an extension of time for 25 years (to December 31, 2029) and revoked the Phase 2 development. In March 2007, the District received updated permits that reflected these changes. One permit appropriates 48,030 afa of storage, and the second permit appropriates 20,000 afa of storage and 116 cfs of direct diversion year-round (Note: *116 cfs = 75 MGD*). The permits taken together establish a maximum amount of storage per year under both permits to be 48,030 afa, and a maximum amount to be appropriated by diversion to be 84,000 afa.

A key challenge facing the District over the next two decades is how best to protect and utilize the water rights under permit for the benefit of the District's wholesale customers, and more generally, of the community. The District initiated the Water Resource Planning process to address this issue and to identify and pursue new water uses. This planning process was briefly introduced in section 4.1 of this CIP.

7.2 City of Eureka's Water Rights and Relationship to District Rights

An important factor is the relationship between the District's water rights and the City of Eureka's water rights. The City of Eureka holds its own water rights on the Mad River. The City secured these rights for their Mad River Project, which supplied the City's water needs from the 1930's and up until the time the District's project commenced operation in 1962.

The City of Eureka was originally granted two permits, Nos. 4444 and 10342, in 1933 and 1955 respectively. Permit No. 4444 appropriated 7.74 cfs by direct diversion and 750 afa by storage. Permit No. 10342 appropriated 2.32 cfs by diversion.

The District and City of Eureka executed the original Municipal Water Supply Agreement in March 1961. An addendum to the original agreement was executed later that year. This addendum addressed preservation of the City's water rights, and the relationship between the City's rights and the District's water rights. The addendum specified, among other things, that water supplied to the City by the District shall be treated as water stored and diverted and appropriated by the City under its permits, and shall be reported by the City to the State Water Rights Board as beneficial use by the City pursuant to its permits. Water supplied to the City by the District in excess of the appropriations under the City's permits shall then be applied and reported under the District's water rights permits. *(*Reference: *Addendum to Agreement between City of Eureka and Humboldt Bay Municipal Water District for Municipal Water Supply, December 14, 1961.)*

The City of Eureka was subsequently granted two licenses by the State on August 26, 1969, which represents the final confirmation of their appropriations. License No. 9527 confirms the right to divert 7.74 cfs year round and to store 750 afa in Ruth Reservoir. License 9528 confirms the right to divert 1.2 cfs (Note – this is less than the amount authorized under permit 10342). The State established the total amount allowed under both licenses to be 5,780 afa. (Reference: *January 14, 1971 letter from the SWRCB, Division of Water Rights, to the District.)*

Eureka's water use pursuant to their licenses will not count toward beneficial use under the District's permits.

8. MAINTENANCE PRACTICES

During the District's formative years, most of its resources were dedicated to building infrastructure and facilities for the regional water system. Following that, was a period of extremely difficult financial times given poorly drafted contracts which nearly bankrupt the District. Following these difficult financial times, the District developed a maintenance program in the early 1980's, and thereafter, began investing in preventive maintenance of the regional system.

As the regional system developed and became more sophisticated, so did the maintenance program. Today the maintenance management system tracks daily, weekly, monthly, semi-annual, and annual maintenance activities on a variety of equipment and processes. Its philosophy is proactive, rather than reactive, with a focus on reliability-centered maintenance activities which boost productivity, reduce costs, and enhance equipment life. Factors such as risk, safety, environmental integrity, energy efficiency, and customer service drive the maintenance program. Strong maintenance practices will continue to be employed to preserve the regional water system infrastructure.

9. DISTRICT'S MISSION AND GOALS AND RELATIONSHIP TO CIP

The District's Mission, introduced in Chapter 2, succinctly defines the District's core business– why we are here and what we are supposed to do. Infrastructure plays an important– in fact essential-role in the District's ability to meet its mission. How the District maintains its infrastructure and how and when it invests in its infrastructure, are critically important in supporting the District's service to our community.

Mission Statement

1) Reliably deliver high quality drinking water to the communities and customers we serve in the greater Humboldt Bay Area at a reasonable cost;

2) Reliably deliver untreated water to our wholesale industrial customer(s) at a reasonable cost;

3) Protect the long-term water supply and water quality interests of the District in the Mad River watershed.

The Board established five goals to support the mission. A number of them relate to the District's infrastructure in one way or another (noted in *italics* below).

Goals

1. **Safety and Public Health** *(Infrastructure plays a role in establishing the environment, which either supports or hinders safety, and the ability to operate the system to protect public health)*
    a. Employ safe work practices to ensure worker and public safety at all times. Strive for no on-the-job reportable injuries each year
    b. Operate the regional water system in accordance with state and federal safe drinking water laws and regulations at all times to protect public health.
2. **Financial** *(Infrastructure, and the extent is to which it is maintained and invested in, will influence the financial position of the District in a manner which will either benefit or harm ratepayers over the long term)*
    a. Perform work in a cost conscience manner at all times to ensure the lowest possible rates to our customers, consistent with the public health, service, and reliability goals of the District.
    b. Plan activities and projects for the subsequent year during the annual budget process. Manage activities and projects consistent with the approved budget.
3. **System Operation and Maintenance**
    a. Maintain and upgrade the regional water system to ensure it reliably supplies and delivers water in accordance with the needs of our customers. *(Infrastructure directly supports this)*

b. Employ preventative maintenance practices to preserve the infrastructure in good working order for as long as possible, but also invest in infrastructure upgrades/improvements when it makes financial and operational sense to do so.

4. Customer Service

a. Understand, and then meet, the community's water supply needs.

b. Work collaboratively with our wholesale customers on commercial and operational matters of importance relating to our water supply and/or the regional water system.

5. Future Positioning

a. The regional water system has reliably served the water supply needs of the Humboldt Bay area for 50 years. Develop a long-term infrastructure plan to ensure the regional water system can reliably serve our community for the next 50 years. (*Development of this CIP directly supports this goal.*)

b. Work diligently to protect the District's water supply resource – both quality and quantity - by ensuring local control of our water rights and protection of the watershed.

c. Attract and retain qualified employees to carry out all aspects of the District's business. Promote training and professional development of our employees, and support them in carrying out their duties for the District. *(The condition of the District's infrastructure may indirectly affect this.)*

d. Work with regulatory agencies to: 1) ensure the necessary permits for District operations and maintenance activities are issued in a timely, cost effective manner, and 2) promote longer-term regulatory stability and certainty for the District.

e. In light of climate changes which are occurring, as well as California's commitment to reduce greenhouse gas emissions (pursuant to Assembly Bill 32), evaluate and support initiatives or projects which reduce the District's greenhouse gas emissions, consistent with the District's mission and core business.

(Mission and Goals approved by Board of Directors, April 13, 2007)

10. POLICY FRAMEWORK FOR INFRASTRUCTURE PLANNING

Many factors influence the need for capital improvements or for replacement of the District's infrastructure, which comprises the regional water system. To address this, the District developed a policy framework to guide and prioritize infrastructure investments.

First, it is important to define the scope of infrastructure projects considered in this plan. The scope has been narrowly defined to include projects which meet one of two objectives: 1) improvements or replacement of ***existing*** infrastructure necessary to support the District's mission, and 2) infrastructure necessary to meet new growth or development. Projects to

accomplish other objectives are not included in this CIP, yet additional project needs are quite likely to arise over the planning horizon - for example, projects triggered by new regulatory requirements, projects to address emerging issues, or projects which take advantage of new technology like in-line hydro. There may also be projects which make economic or operational sense at some point in the future – for example additional water storage at Korblex beyond the current one million gallons.

As noted in the introductory chapter, this plan is intended to be a "living document" so, as opportunities and issues arise over the planning horizon, the policy framework and proposed projects will be revisited and updated as necessary.

10.1 Infrastructure to Meet Growth/Development

Growth or new development may occur within areas served by the District's existing wholesale municipal customers. Alternatively, growth or development may occur outside the service areas of our existing municipal customers yet within the existing District boundaries (e.g. Town of Samoa). And finally, growth may occur if an existing community outside of the District would like to join the District and be served by the regional water system at some time in the future (e.g. Loleta, Westhaven, Trinidad).

Such growth and development will eventually lead to infrastructure additions. Examples of such additions include: additional supply capability from the Ranney wells; expansion of the domestic water pipeline on the Samoa Peninsula to meet growth within Humboldt CSD and/or growth on the peninsula; and a new booster pump station to accommodate growth in the Blue Lake/Fieldbrook-Glendale area.

10.2 Infrastructure Improvements/Replacements on Existing System

The regional water system is comprised of numerous infrastructure components which perform a variety of important functions. As part of this planning effort, the District developed a comprehensive inventory of its infrastructure and other assets which are described in Chapter 11.0.

Development of criteria which differentiate the need for, and proposed timing of, capital improvements or replacements was one of the more challenging aspects of this planning effort. For example, how does one know when to replace the hydraulic system which operates the slide gate underneath Ruth Lake at Matthews Dam, in comparison to when to replace the pipeline made of Techite (a fiberglass-based material) at the southern end of the Samoa Peninsula? How does the relative priority of just these two replacement projects compare to one another?

The District developed a framework, as well as asset-ranking criteria, to guide the proposed capital improvement and replacements projects for the existing system. Key components include:

Useful Life - One of the most important factors to consider is the remaining useful life of an asset. This factor attempts to define and balance maximizing the use of an existing asset, versus replacing that asset before catastrophic failure occurs, or before maintenance costs increase so much that earlier replacement would have been more economic. This factor is aimed at maximizing ratepayer benefits of existing assets yet avoiding costly maintenance and/or failures. This concept sounds simple, but the challenge arises in attempting to actually define the remaining useful life of each asset.

Redundancy and Importance – These factors define how important an asset is to the District to enable it to carry out its mission. ***Redundancy*** addresses to what extent the system will still function if the asset fails. ***Importance*** addresses the importance of an asset more generally. A number of sub-factors are considered to help determine and differentiate the importance of specific projects. Such sub-factors include:

- Public health;
- Safety;
- Regulatory requirements;
- Increased service reliability;
- Increased capacity;
- Improved system operations or maintenance (which often results in lower costs);
- It would be "nice to do" because…

11. CAPITAL IMPROVEMENT PLAN - DEVELOPMENT

The District develops a detailed budget plan each year. Specific maintenance projects, capital projects, and professional service projects are defined and presented to the Board for consideration and approval to support the annual budget plan. This process does well to focus on the District's short-term needs; however, it does not adequately address longer-term planning needs.

This CIP is intended to address the longer-term planning needs by defining proposed infrastructure projects over the next 15 years. Although the planning horizon for the CIP is 15 years, the outcomes (given execution of proposed projects) will enable the District to reliably meet its service mission to the community over the next 30-50 years.

The process the District went through to develop the CIP is presented in the balance of this chapter (Chapter 11). The results of the planning process and proposed projects are presented in Chapter 12. Supporting details are included in the Appendices as follows:

Appendix A – Maintenance and Reoccurring Projects (through 2025/26)

Appendix B – Capital Improvement/Replacement Projects (through 2025/26)

Appendix C – Subset of Capital Improvement/Replacement Projects (those for the Regional/Domestic System) sorted by cost (highest to lowest)

Appendix D – Project Worksheets for CIP Projects proposed for first 5 years

Appendix E – Financial Plan

Appendix F - List of Infrastructure and Project-related Engineering Studies

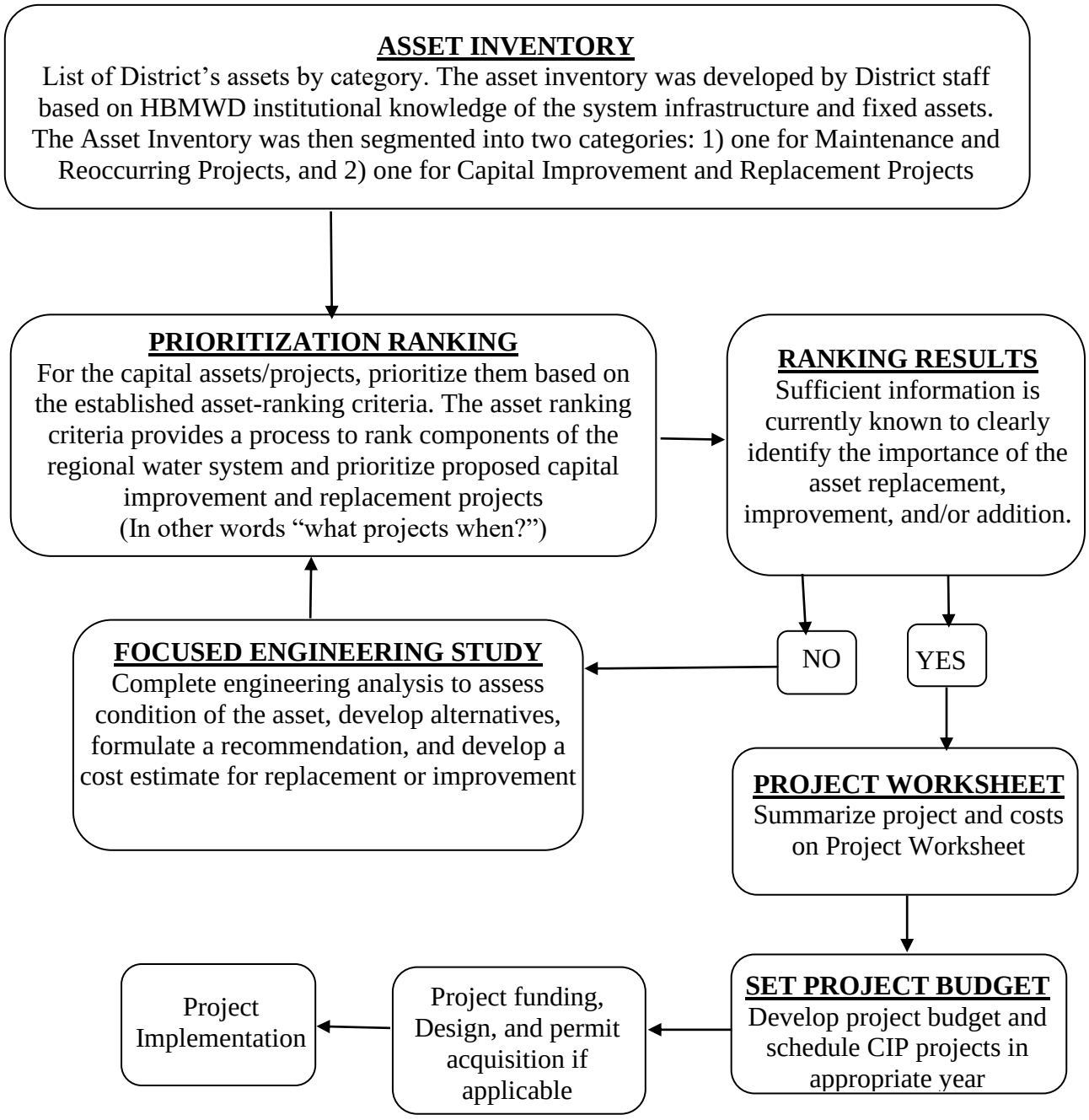
Appendix G – Summary of Potential Water System Loan and Grant programs

Appendix H - Asset Management: A Handbook for Small Water Systems, United States Environmental Protection Agency

Appendix I – Communication Toolkit, Association of California Water Agencies

11.1 Overview of CIP Development Process

The CIP has been developed in accordance with the steps presented in the flowchart below.



11.2 Asset Inventory

The District's infrastructure was divided into categories in accordance with the function it performs. This categorization is closely aligned with the District's Class of Accounts (in its accounting system). Three broad categories in the asset inventory are as follows:

I. Regional System (e.g. common infrastructure/assets) and Domestic Water System

1. Source of Supply – R.W. Matthews and Ruth reservoir
2. Diversion and Pumping (Ranney collectors and appurtenant systems/equipment)
3. Water Treatment
    a. Chlorination Facility
    b. "CT" Tank
    c. Turbidity Reduction Facility
4. Water Storage and Transmission
    a. Korblex reservoir
    b. Transmission System
        - Pipelines and appurtenances
        - Samoa Booster Station
        - Cathodic Protection
5. Support Systems (facilities, systems and equipment which support operations)
    a. Electrical Systems and equipment
    b. Communication and control
    c. Buildings
    d. Various additional categories for the maintenance project inventory

II. Hydro-electric plant

III. Industrial Water System

1. Diversion and Pumping
2. Water Storage and Transmission

11.2.1 Asset Inventory Lists

Two asset inventory lists were developed. The first is for Maintenance and Reoccurring Projects. The purpose of this inventory is to catalog, and facilitate planning of all ongoing maintenance projects and other routine projects which reoccur at some frequency. The second is for Capital Improvement and Replacement Projects. The purpose of this inventory is to plan capital improvement and replacement projects, and capture their proposed timing given the results of the asset ranking and prioritization process.

It bears repeating that the proposed projects address two objectives: 1) improvement or replacement of *existing* infrastructure necessary to support the District's mission, and 2) infrastructure necessary to meet new growth or development. Projects to accomplish other objectives are not included in this CIP.

11.2.2 Transmission System Replacement - Need to Address in Future CIPs

There is a very important caveat regarding the scope of the Capital Improvement and Replacement inventory – it does *not* include projects and costs related to a system-wide pipeline replacement program. Specific sections of the transmission mains have been identified for replacement, such as the 18-inch Techite pipeline at the southern end of the Samoa Peninsula, and possibly the 15-inch domestic system pipeline on the Samoa Peninsula (if growth materializes in the later years of the planning horizon).

System-wide replacement has not been included since the anticipated service life for the domestic and industrial transmission mains extend past the 15-year planning horizon for this version of the CIP. The pipes were installed in the 1960's & 1970's and it is anticipated that they will have a life expectancy of 75 to 100 years. Therefore, they will not likely need to be replaced until between 2035 to 2060. The pipeline system is in good shape largely due to the cathodic protection system which protects these pipelines. The cathodic protection system is regularly inspected and maintained and the anodes replaced as needed. Furthermore, the pipelines have been visually inspected every time they are exposed, and the wall thickness and general condition has been found to be in good shape. *(Note: In the late 1980's, the Industrial Pipeline was video inspected at two places, one in the Arcata Bottoms and one on the Samoa Peninsula. The pipeline was accessed via a manhole, and a video camera run down the pipe for a few hundred feet. The intent was to inspect the mortar lining to check if it was cracked or had spalled. The District engineers reported the video was of poor quality and not very useful).*

It is highly recommended that a systematic inspection and replacement program be developed and included in the CIP well in advance of any necessary replacement, as this will be a major cost when it occurs.

11.3 Asset Ranking Criteria and Prioritization for Existing System Infrastructure

Project prioritization based on asset-ranking criteria is an important aspect of the CIP. Its purpose is to define a set of criteria the District will use to guide the ranking and proposed priority of rehabilitation, replacement and improvement projects. A number of resources were used to establish the District's proposed asset-ranking criteria, including: US EPA's Asset Management Handbook for Small Water Systems (Appendix H), Capital Investment Plans and an Asset Management Workshop, the Rural Community Assistance Corporation, and CIPs from several local agencies (Sonoma County Water Agency, City of Santa Rosa, City of Eureka, McKinleyville CSD, and Humboldt CSD).

Each asset has been ranked to form the basis for its proposed placement in the CIP (e.g. when should an asset be replaced or improved?). Over time, rankings may change based on updated information regarding the condition of an asset, or changing external conditions such as new regulations or new service requirements.

A set of criteria in three distinct categories was developed for ranking individual projects. The categories and associated criteria are intended to support the District in carrying out its mission and goals. The three categories are: *Remaining Useful Life*, *Importance*, and *Redundancy* of the asset relative to other assets in the system. Each of these categories and associated criteria are discussed below. A Priority Ranking Score has been computed for each asset and is presented in the Asset Inventory spreadsheets.

11.3.1 Remaining Useful Life

The anticipated remaining useful life for each asset in the regional water system has been estimated based on the results of visual inspections, physical inspections, or performance evaluations, engineering studies, manufacturers' recommendations, HBMWD's institutional knowledge, or US EPA's Typical Equipment Life Expectancy (as presented in their Asset Management Handbook, Appendix H).

A Priority Ranking Score was established for each of the criteria as shown below in Table 1. Similar to the EPA guidelines, assets with a shorter remaining useful life have a higher priority, and therefore, receive a higher Priority Ranking Score. If the asset does not have a clearly defined remaining useful life and will likely continue to function, but is operating at reduced efficiency such as an electric motor for a centrifugal pump, a ranking score of 3 was established to reflect an increase in operating and/or maintenance costs.

Table 1. Criteria and Priority Ranking Score for Remaining Useful Life

Criteria	Priority Ranking Score
< 2 yrs	4
< 5 yrs	3
Operating below manufacturer's recommended performance efficiency or beyond the recommended useful life	3
5-20 yrs	2
> 20 yrs	1

11.3.2 Importance

Criteria representing the importance of each asset relative to one another in the regional water system has been adopted from the US EPA's suggested Prioritization Scheme, and further refined in the development of this CIP. A Priority Ranking Score was established for a set of criteria as shown below in Table 2. Assets with a higher level of relative importance have a higher priority for replacement, and therefore, receive a higher Priority Ranking Score. Projects may be scored on one or more criteria, thereby increasing the total score.

Table 2a. Criteria and Priority Ranking Score for Importance for *Domestic* Water System

Criteria	Priority Ranking Score
Existing threat to public health	4
Internal safety concern or issue	4
Regulatory requirement or mandate	4
Potential public health or safety concern	3
Increased service reliability or capacity	3
Improved system operations or maintenance (often times reducing costs)	2
It would be nice to do because …..	1

Table 2b. Criteria and Priority Ranking Score for *Industrial* Water System

Criteria	Priority Ranking Score
Internal safety concern or issue	4
Regulatory requirement or mandate	4
Increased service reliability or capacity	3
Improved system operations and/or maintenance	2
It would be nice to do because …..	1

11.3.3 Redundancy

Criteria representing the redundancy of each asset within the regional water system was adopted from the US EPA suggested Prioritization Scheme, with further refinement during the development of this CIP. Redundancy accounts for the ability of the system to function with or without the asset. A Priority Ranking Score was established for each of the criteria as shown below in Table 3. It applies to both the Domestic and Industrial Water Systems. Assets for which there is less redundancy receive a higher priority, and therefore, a higher Priority Ranking Score.

Table 3. Criteria and Priority Ranking Score for Redundancy

Criteria	Priority Ranking Score
System will not function without Asset	4
System will have limited functioning without Asset	3
System requires Asset for Emergency Operations	2
System will function without Asset	1

11.3.4 Composite Priority Ranking

A composite priority ranking has been computed for each asset by averaging the Priority Ranking Score for the three categories described above. As a result of this process, capital improvement and replacement projects are identified and ranked relative to one another. Projects proposed to be accomplished within the first five years of the 15-year planning horizon are scheduled by year. Projects proposed to be accomplished after five years, are shown as a range somewhere between years five through twenty, with timing differences reflecting relative priority (e.g. a project

scheduled in 5-10 year range versus one scheduled between years 10-15 infers a higher relative priority of the former). Replacement of assets which reoccur on a regular basis due to a defined life cycle (such as fleet vehicles or certain equipment) have been scheduled for replacement in the asset inventory over the entire planning horizon.

All identified projects may not be implemented within the 15-year planning horizon based on funding limitations or other constraints. However, the results from the prioritization ranking process should serve as a useful guide for scheduling and budgeting the highest priority projects for implementation.

The ranking process should be conducted on an annual basis, preceding the District's annual budget development process. This will ensure the asset inventory remains current, and the highest priority infrastructure projects are proposed in the annual budget plan.

11.4 Ranking Criteria for Other Assets/Equipment which Support Operations

The ranking criteria and process for replacement of mobile and fixed assets which support operations (such as buildings, vehicles, etc.) do not lend themselves to the same ranking criteria used for the water system infrastructure. Therefore, separate criteria have been developed to guide replacement decisions as follows:

Mobile Assets (e.g. Vehicles and Construction Equipment):
The replacement criteria consider the following factors: primary function, performance, economics, and maintenance record. The proposed replacement frequency is as follows:

- Service Vehicles – Replace every 10 years or after approximately 100,000 miles.
- Construction Equipment – Replace every 15 to 20 years (unless repair history warrants otherwise)

Adhering to the proposed replacement criteria should minimize maintenance costs during the final years of service, maximize performance and efficiency, and provide for a reasonable resale value. The replacement frequency proposed above is consistent with the approved replacement frequency for mobile assets at several local entities. *(*Reference: *McKinleyville CSD, Humboldt CSD, City of Eureka)*

Fixed Assets (e.g., Buildings and Tools/Equipment)
The replacement criteria consider the following factors: primary function, performance, economics, maintenance record, and technology advances:

- Buildings – Replace components (e.g. roofs, carpets) when maintenance cost increase

and/or components begin to deteriorate beyond what routine repairs can address.

- Tools/Equipment – Replace and/or upgrade tools and equipment when worn out, when no longer meeting District needs, or when technology advances increase workforce capability and/or reduce time to complete work activities.

11.5 Focused Engineering Studies

District staff had sufficient knowledge and experience to assess the condition of most infrastructure and assets in the regional water system, and to recommend projects and then complete the prioritization process. However, there were a number of assets for which the District needed engineering assistance to complete that process. Therefore, the District recommended that appropriately-scaled "Focused Engineering Studies" be completed if the condition of an important asset was not known, if deficiencies may exist, or if repair, replacement or improvement options were not fully understood.

Over the course of four years, the District completed over a dozen Focused Engineering Studies related to its infrastructure. These studies provide an assessment of an asset's condition, as well as information regarding alternatives (if applicable) and the recommended improvement or replacement project and estimated costs. Appendix F contains a list of the Focused Engineering Studies completed as part of this CIP process, as well as infrastructure-related analyses or studies previously completed by the District.

11.5.1 Ranney Collector Assessment and Studies

In addition to the general Focused Engineering Studies completed for this CIP, the District embarked on a multi-year effort to assess the condition of its domestic diversion and pumping infrastructure at Essex (the Ranney Collectors), and recommend a programmatic approach to address them. This effort was initiated in parallel given the age of the Collectors and their critical importance to the regional water system - they are 50 years old and arguably the most important component of the drinking water system. The goal of this multi-year effort was to assess the condition of the Collectors and develop a plan for their rehabilitation and expansion. Work completed includes:

- 2002 - underwater video inspections of the caisson and laterals in Collector 2, and a flow test of Collector 2
- 2004 - cleaning and rehabilitation of laterals in Collector 2, plus a post-cleaning flow test to compare to the results from 2002
- 2004/05 - development of a groundwater model for the Essex Reach to support the Ranney Collector planning process (This project was 100% grant funded)

- Various years - installation of monitoring wells to assist with the evaluation and planning effort, and to help calibrate the groundwater model
- 2006 - underwater video inspections of the caissons, laterals and appurtenances in each of the remaining Collectors (1A, 3 and 4) plus inspection of the siphon line between 1 and 1A, and physical tests, including relative flow, in each lateral
- 2008 – final evaluation report with recommendation to proceed with a systematic lateral replacement program

The resulting reports from these assessments and analyses are listed in Appendix F in the Domestic Diversion and Pumping category.

Following the extensive assessment and evaluation process, Collector 3 was chosen as the location for the first lateral replacement project. The groundwater model and associated hydro-geological investigations at this Collector indicated that it has suitable zones for the addition of new laterals, and the potential to produce approximately 10 MGD. The fact that it is land based and accessible all year made this Collector a good choice for the first lateral replacement project. In 2009, plans and specifications were developed for the installation of three new laterals at Collector 3. Collector Wells International, Brechtel Radial Collector Wells and the Sonoma County Water Agency were contacted to provide technical assistance during development of the plans and specifications.

The Collector 3 lateral replacement project went out to bid in 2011, and construction is scheduled for the 2011/12 winter season. Upon completion of this project, the outcome will be evaluated and specific plans – with respect to scope and timing - for the remaining Collectors developed.

11.6 Infrastructure to Meet Increased Customer Demands or New Functions

At some point in the future, infrastructure additions will be triggered by growth or new development within the District's service territory. Humboldt County is in the process of updating its General Plan. Growth is projected to occur in certain communities served by the District, although the overall growth rate within the County is estimated to be quite modest.

Growth or new development will likely affect or trigger infrastructure projects in the following areas:

1. Increased supply capacity in the Ranney collectors (which would most likely be accomplished by installing additional laterals);

2. Upgrade/replacement of the domestic water line on the Samoa Peninsula – This system is operating near capacity with almost all of the capacity committed to existing customers. If additional supplies are required to serve growth or new development on

the peninsula or to the Humboldt Community Services District, upgrades will be required.

3. Additional domestic water storage capacity on the Samoa Peninsula. (Note- based on the current design philosophy of the regional system, this should be addressed by the current or future retail service providers on the peninsula).

4. Additional supply capacity to the Blue Lake/Fieldbrook-Glendale area (Note - based on a study completed by the Fieldbrook-Glendale CSD, this would most likely be accomplished by installing a booster pump station to increase pressure and flow).

12. CIP – RESULTS AND PROPOSED PROJECTS

12.1 Categories in which Results Presented

The last chapter introduced two asset inventory lists to segment the proposed project plans: one for Maintenance and Reoccurring projects, and a second for Capital Improvement and Replacement projects.

The District further segmented the project plans given two unique situations that warrant special consideration, and to better position the District to determine how to fund the proposed CIP projects. The District segmented the project plans into three infrastructure categories:

1. Regional and Domestic Water System components (regional includes assets common to or supportive of both Domestic and Industrial Water Systems)
2. Hydro-electric plant
3. Industrial Water System

The Industrial Water System has been segmented into its own category given loss of the industrial customer base and the fact that the industrial system is now idled. Absent new industrial customers, or other customers which trigger use of that system again, the District is not in a position to pursue any capital improvement or replacement projects on the industrial system. This segmentation also serves to define the proposed CIP projects and costs for any prospective customer or opportunity which uses that system.

The hydro-electric plant has also been segmented into its own category since it is not a necessary component of the regional water system. Absent it, the District is still able to meet its service mission to deliver water to the community. Additionally, given the

revenue-generating aspect, different criteria should be used to evaluate proposed capital improvement and replacement projects. The District should conduct an engineering-economic analysis to determine if future investments in the hydro-plant are prudent and make economic sense for the District and its ratepayers.

The financial plan (Appendix E) is summarized in Chapter 13. It addresses the financing needs for the Regional/Domestic System only given the factors noted above.

12.2 CIP Results

A summary of the CIP results by category is presented in Table 4. Highlights are noted below (dollars rounded to thousands).

Maintenance and Reoccurring Projects total $5,719,000 over the 15-year horizon.

Regional and Domestic Water System CIP projects:

- Range: $123,000 to $23,935,000 per year
- Five year totals: 2012- 2016 = $10,729,000
  2017 – 2021 = $14,259,000
  2022 – 2026 = $35,144,000
- Total over 15 years: $60,133,000

Hydro-electric Plant CIP projects:

- Range: zero to $1,994,000 per year
- Five year totals: 2012- 2016 = $769,000
  2017 – 2021 = $2,757,000
  2022 – 2026 = zero
- Total over 15 years: $3,525,000

Industrial Water System CIP:

- Range: zero to $1,653,000 per year
- Five year totals: 2012- 2016 = $1,565,000
  2017 – 2021 = $2,940,000
  2022 – 2026 = $1,212,000
- Total over 15 years: $5,716,000

Table 4. Total Project Costs by Year
Maintenance & Reoccurring Projects plus CIP Projects by Categories

Project Categories	Costs															Grand Total
	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	
Maintenance & Reoccurring Projects (1)	$ 361,917	$ 555,338	$ 324,220	$ 333,725	$ 344,447	$ 309,522	$ 305,863	$ 240,462	$276,706	$ 710,369	$ 424,732	$ 258,150	$ 258,155	$ 528,997	$ 486,839	**$ 5,719,443**
Capital Improvement and Replacement Projects:																
Regional/Domestic System																
a) Source of Supply	$ -	$ 55,591	$ -	$ -	$ -	$ 134,075	$ 68,544	$ -	$ -	$ 2,377,977	$ 743,912	$ 877,488	$ 89,880	$ -	$ -	**$ 4,347,467**
b) Diversion and Pumping	$1,693,064	$ 249,459	$ -	$1,924,641	$ -	$ -	$4,402,764	$ 160,370	$ 42,318	$ 637,063	$ -	$1,754,337	$2,009,146	$1,907,646	$ 2,030,869	**$ 16,811,678**
c) Water Storage & Transmission	$ 287,795	$3,120,510	$ -	$1,977,727	$ -	$ 344,408	$ 209,715	$ 386,347	$402,875	$ 420,109	$ 307,483	$ 293,056	$ 269,640	$ 281,175	$21,884,251	**$ 30,185,092**
d) Water Treatment	$ -	$ 881,540	$ -	$ -	$ -	$ 563,248	$ 761,119	$ 164,337	$ -	$ -	$ 595,129	$1,116,088	$ 80,892	$ 18,745	$ 19,547	**$ 4,200,646**
e) Support Systems	$ -	$ -	$ 123,418	$ -	$ 415,266	$ 107,260	$1,085,913	$ 176,522	$158,684	$ 1,656,337	$ -	$ -	$ 808,921	$ 56,235	$ -	**$ 4,588,555**
Sub-Total Regional/Domestic (2)	$1,980,859	$4,307,101	$ 123,418	$3,902,368	$ 415,266	$1,148,990	$6,528,056	$ 887,576	$603,876	$ 5,091,486	$1,646,524	$4,040,969	$3,258,480	$2,263,801	$23,934,667	**$ 60,133,437**
Hydro-Electric Plant	$ -	$ -	$ 763,298	$ 5,548	$ -	$1,983,764	$ -	$ -	$314,460	$ 458,646	$ -	$ -	$ -	$ -	$ -	**$ 3,525,717**
Industrial Water System	$ 364,562	$ 56,695	$ 534,606	$ 570,052	$ 38,946	$ 457,195	$1,652,558	$ 806,232	$ -	$ 23,571	$ -	$ 45,883	$ -	$ 227,433	$ 938,252	**$ 5,715,986**
Total CIP Projects	**$2,345,422**	**$4,363,797**	**$1,421,322**	**$4,477,968**	**$ 454,213**	**$3,589,949**	**$8,180,613**	**$1,693,808**	**$918,336**	**$ 5,573,704**	**$1,646,524**	**$4,086,852**	**$3,258,480**	**$2,491,235**	**$24,872,919**	**$ 69,375,140**
Total Cost to Maintain Regional and Domestic Systems (sum of items 1 and 2)	$2,342,777	$4,862,440	$ 447,638	$4,236,093	$ 759,714	$1,458,513	$6,833,918	$1,128,038	$880,582	$ 5,801,855	$2,071,256	$4,299,118	$3,516,635	$2,792,798	$24,421,506	**$ 65,852,880**
Totals in 5 Year Increments					$10,729,012					$14,259,984					$35,144,441	

The Regional/Domestic CIP total includes one very large project, replacement of the 15-inch domestic water line on the Samoa Peninsula. This project is assumed to occur the last year of the 15-year planning horizon at a cost of $21.5 million (2025 dollars). Absent this project, the total Regional/Domestic CIP total over the 15-year planning horizon is $39 million. As introduced in Chapter 11, that pipeline is operating very near its maximum capacity and additional growth or development will trigger an upgrade and possibly full replacement. When this upgrade will be needed is uncertain, so the CIP includes a conservative, but reasonable, assumption that it is necessary, but at the end of the planning horizon.

Figure 2 presents the total project costs to operate, maintain and improve the Regional and Domestic System. It includes the Maintenance and Reoccurring projects and the Regional/Domestic CIP projects. Historical project costs are included to put the prospective costs in context. For purpose of presentation, the CIP total in the final year (2025/26) is not shown to scale due to one very large project- replacement of the 15-inch domestic water line on the peninsula in 2025/26. Inclusion of this project (at $21.5 million) significantly expands the y-axis of the graph and limits the ability to see year-by-year cost details.

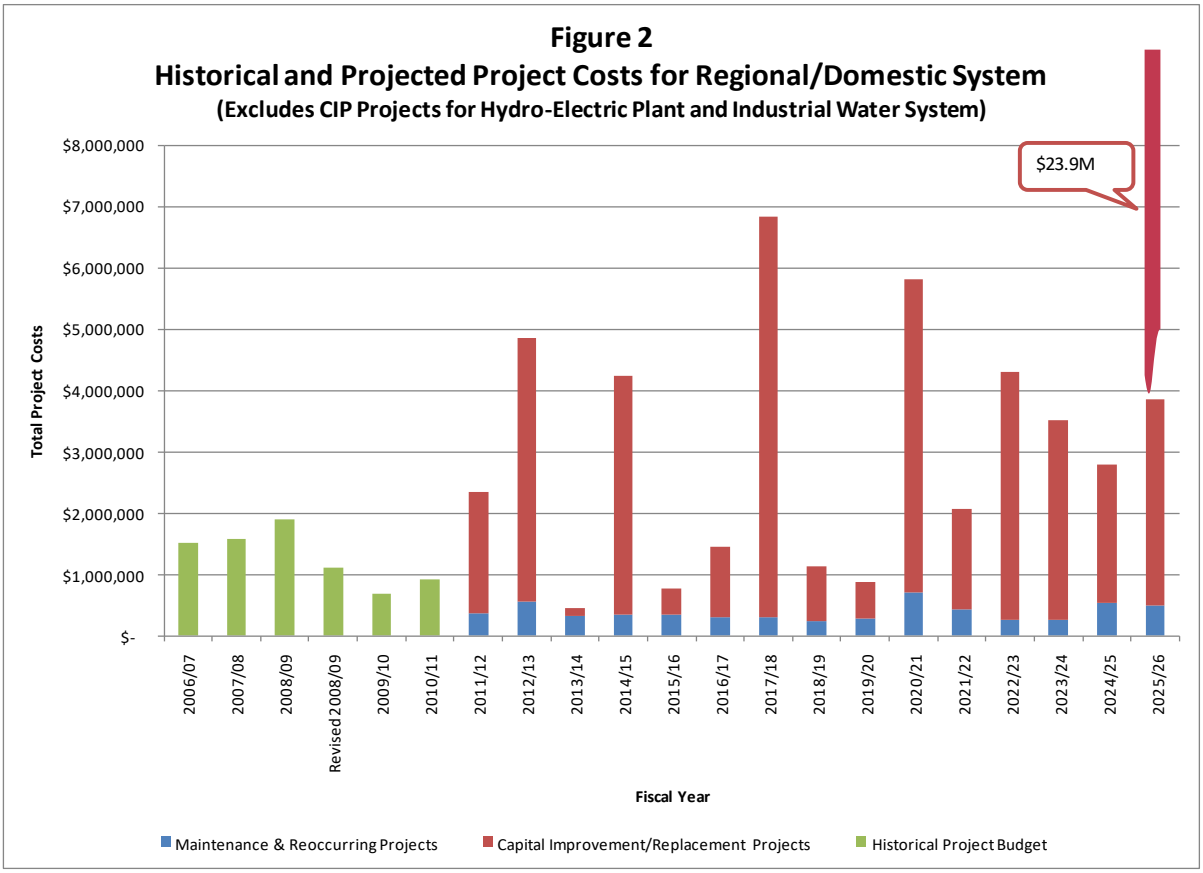


Table 5 presents the Regional/Domestic CIP projects organized by dollar amount, largest to smallest. The CIP includes 110 projects which total $60.1 million. Twelve projects - 11% in number - total $44 million which represents 73% of the total projected costs.

Table 5. Regional/Domestic CIP Projects by Cost Range

Cost Range (Million $)	Number of Projects in Range	Percent of Projects in Range	Total Cost	Percent of Total Cost	Average Cost per Project
Over 3.5	1	1%	**$21,501,614**	**36%**	$21,501,614
2.0-3.5	2	2%	**$5,498,487**	**9%**	$2,749,244
1.5 - 2.0	9	8%	**$16,567,462**	**28%**	$1,840,829
1.0 - 1.5	0	0%	**$0**	**0%**	$0
0.5 - 1.0	7	6%	**$5,128,850**	**9%**	$732,693
0.25 - 0.50	9	8%	**$2,872,828**	**5%**	$319,203
0.100 - 0.250	43	39%	**$6,718,143**	**11%**	$156,236
0 - 0.100	39	35%	**$1,846,053**	**3%**	$47,335
Total	**110**	**100%**	**$60,133,437**	**100%**	$546,668

12.3 Escalation Rates

12.3.1 Basis For

Project costs have been escalated to account for inflation. Costs for projects developed before 2010 were first brought forward to a 2010 cost basis, based on the average rate of inflation since originally estimated. Cost estimates were then escalated from 2010 to the year in which the project will be performed based on one of two escalation factors.

Escalation Factor 1 (EF1) is 4.3%. This factor was used for all projects which include materials and labor. It is based on Engineering News Record's average construction inflation rate for San Francisco for years 2004-2009. Escalation Factor 2 (EF2) is 3.5%. This factor was used for projects with mainly labor- dependent costs. It is based on Engineering News Record's average escalation rate for construction labor for San Francisco from years 2004-2009.

12.3.2 Sensitivity Analysis

A sensitivity analysis was performed to understand how changes in the assumed escalation rates affect the projected CIP costs. Total CIP costs over the 15-year planning horizon were calculated for two scenarios – 2% below and 2% above the escalation factors assumed for this plan. Table 6 presents the results of this sensitivity analysis.

Table 6. CIP Costs (for all 3 categories) for Varying Escalation Rates

	Rates Lower than Base	Base Case	Rates Higher than Base		
	Scenario 1		**Scenario 2a**	**Scenario 2b**	**Scenario 2c**
	(2% lower than base case)	(rates assumed for CIP)	(2% higher than base case)	(4% higher than base case)	(6% higher than base case)
Time Period	EF1 = 2.3%	EF1 = 4.3%	EF1 = 6.3%	EF1 = 8.3%	EF1 = 10.3%
	EF2 = 1.5%	EF2 =3.5%	EF2 = 5.5%	EF2 = 7.5%	EF2 = 9.5%
2012-2016	$12 million	$13 million	$14 million	$15 million	$16 million
2017-2021	$17 million	$20 million	$24 million	$28 million	$33 million
2022-2026	$27 million	$36 million	$49 million	$65 million	$86 million

The assumed escalation factors should be reviewed and adjusted periodically (at least every 5 years) to adjust the projected CIP costs to reflect current inflation rates.

12.4 Project Worksheets

A Project Worksheet was developed which includes a project description, justification, anticipated cost, and potential funding sources. The worksheets provide additional information about proposed CIP projects to support the District's annual budget process as well as the initial round of grant applications.

Project Worksheets have been completed for all CIP projects proposed in the first five years of the 15-year planning horizon. Completed Project Worksheets are included in Appendix D.

13. WHOLESALE CONTRACTS - IMPLICATIONS FOR CIP

For many years, the District had contracts in place with eight wholesale customers for the entire 75 MGD supply capability of the regional system (60 MGD with two large industrial users and the remainder with seven wholesale municipal customers). As discussed in Chapters

2 and 3, the two pulp mills served by the District ceased operation (one in the mid-1990s and the second in 2009). Loss of the industrial customers resulted in a significant cost shift to the District's municipal customers. The wholesale contracts fortunately accommodated these difficult financial transitions.

Currently, the District has long-term contracts in place with its seven wholesale municipal customers. The contracts commenced in 1999 and have a 20-year term, or longer until SRF debt service to the State for the TRF is paid in full. Given the latter condition, these contracts will be in place until approximately 2022.

These contracts specify the terms and conditions by which the District provides wholesale water service. An important feature of the contracts is that they specify that all operating, maintenance and capital costs (including debt service) associated with the existing regional water system are to be paid in-full by the wholesale customers. In other words, the contracts utilize a "pay-as-you-go" approach. Within this rate structure, capital projects to replace or upgrade the regional water system can be funded.

The contracts define a cost allocation methodology (via "Price Factors") to allocate costs among the wholesale customers. Costs are first allocated at the system level – to either the Industrial Water System or the Domestic Water System. Costs allocated to each system are then allocated among customers served by that system (in other words, costs allocated to the Domestic Water System would then be allocated among the seven wholesale municipal customers).

The contracts also specify that revenues received by the District, other than those associated with wholesale water sales, are credited back to the wholesale customers, and thus offset the costs that the wholesale customers otherwise pay. Examples of such revenues which are credited back to the wholesale customers include the District's share of 1% property taxes, power sales from the hydro-electric facility, interest income, revenues associated with retail water service, and other miscellaneous revenues.

A summary of the cost allocation provisions of the wholesale contract is summarized in Table 7.

Table 7. Wholesale Contract Cost Allocation

Cost Category (per Ordinance 16 Price Factors)	Municipal Customers'	Industrial Customer(s) Cost

	Cost Share	Share
Debt Service for Turbidity Reduction Facility (PF 1)	100%	0%
Operation, Maintenance and Capital Expenditures for drinking water treatment facilities (PF 2)	100%	0%
Operation, Maintenance and Capital Expenditures for other components of the regional water supply, collection, pumping and transmission system (PF 2)	Was 55%, but now 100% given loss of industrial customers	Was 45%, but now none given loss of industrial customers
Power Costs for Pumping Water (PF 3)	Based on actual power use	Based on power actual use
Additions to Reserves (PF 4)	See formula in contract	See formula in contract
Special Facilities (PF 5)	Pursuant to new contract	Pursuant to new contract
Mandated Facilities (PF 6)	Based on benefit	Based on benefit

There are several important features of the wholesale contracts related to funding projects proposed in the CIP.

- The municipal contracts allow the costs of larger capital projects (greater than $200,000) to be charged out up to three years in advance, thereby providing a mechanism to spread out larger capital costs and help manage end-use rates to consumers.
- The maximum aggregate capital cost that the District may charge to its wholesale customers in any fiscal year (via Price Factor 2) is 2% of the District's un-depreciated Property, Plant and Equipment (as reflected in the audited financial statements). Currently, the District's un-depreciated Property, Plant and Equipment are $51,703,451. Therefore, the 2% aggregate annual capital limitation is $1,034,069. This provision will become a limiting factor in the District's ability to

use its Ordinance 16 contracts to fund future infrastructure projects, absent agreement from our wholesale customers to amend this provision.

- The contracts accommodate "Special Facilities" (Price Factor 5) which are new facilities constructed or purchased by the District at the request of, or for the benefit of, one or more of its customers. Special Facilities are done pursuant to a separate contract, which among other things, would specify cost recovery and cost allocation mechanisms among participating customers.
- The contracts also accommodate "Mandated Facilities" (Price Factor 6) which are new or upgraded facilities required by law, regulation, order or other governmental mandate.

14. SUMMARY OF FINANCIAL PLAN (Prepared by Bartle Wells Associates)

14.1 Background

In March 2010, the District retained Bartle Wells Associates (BWA) to develop a long-term financial plan to fund operating and capital expenses for its seven wholesale customers. With the closure of the Evergreen Pulp Mill in 2009, all operating and capital costs associated with the Domestic/Regional System are now allocated to the municipal customers. The objective of the financial plan is to develop financing options for the District's CIP and project future wholesale rate adjustments that are fair and equitable to the municipal customers, and recover the full cost of providing service annually.

14.2 Overview of Financing Options Available to District

Generally speaking, the District has five basic sources of revenue to fund its operation:

1. revenues from water sales
2. revenues from other sources (e.g. connection fees, if charged, power sales)
3. proceeds from taxes
4. proceeds from grants
5. proceeds from bonds or loans (which must then be repaid)

As discussed above, the District's wholesale contracts collect sufficient revenues to cover all current operating and capital costs, including debt service. The only taxes received by the District are its share of the 1% local property taxes, which are credited back to the wholesale customers, thus offsetting the cost of wholesale water service.

With respect to financing future infrastructure replacements, upgrades, or additions, there are several options for the District to consider. In general BWA recommends funding annual repairs and maintenance on a pay-as-you-go basis, using operating revenues to pay for these annual repairs. For the CIP, BWA recommends the District use any net revenues available and then financing larger capital projects using a combination of grants, loans, and certificates of participation.

BWA recommends that the District apply for grants and low-cost loans to fund capital projects when possible. However, grants are difficult to secure and often only provide a small amount of funding if awarded; State Revolving Fund loans are limited and time-consuming to secure which make them an option for future capital needs but not for immediate projects. Based on current market conditions and interest rates, BWA recommends the District seek competitively bid "Private Placement" loans for smaller capital projects and issue revenue-secured certificates of participation (COPs) for larger borrowings (typically over $8-10 million). The following section includes an overview of the recommended financing methods.

14.2.1 Grant and Low-Cost Loan Opportunities for Water Infrastructure Funding

A summary of all known water grant and loan programs is included in Appendix G. The programs which the District should consider given the proposed CIP projects are summarized below.

The District is eligible for several funding opportunities offered by the California Department of Public Health, the California Department of Water Resources, and the US Department of Agriculture. The California Department of Public Health administers the Drinking Water State Revolving Fund loan program. All types of water projects are eligible for loans; however, projects that correct existing public health risks get priority. The typical term for a loan is 20 years at about 2.5 percent interest. Disadvantaged communities are often given partial grants or more favorable loan terms (i.e. a 30 year loan and/or 0 percent interest). Most years, State Revolving Loan program funds are typically over-subscribed and not all projects are funded.
The California Infrastructure and Economic Development Bank offers a similar loan program for agencies that require bridge financing before other financing takes effect and for agencies that are not able to receive other forms of affordable financing. The Infrastructure Bank typically offers loans at 3 to 3.5 percent interest.

As a party to the North Coast Integrated Regional Water Management Plan, the District is eligible for planning and construction grants through the Department of Water Resources. The North Coast region has been allocated multiple millions of dollars of grant funding for water infrastructure projects over the next several years. The most

recent grant cycle application deadline has passed, but new applications are expected to be released in 2011.

Service areas of the District may be eligible for grants and loans through the US Department of Agriculture (USDA) Rural Development Program. The USDA offers funding to communities with 10,000 people or fewer and to rural areas with no population limits. It is possible that if the City of Blue Lake and the Fieldbrook-Glendale Community Services District (FG-CSD) engage in a cost sharing arrangement with the District then Blue Lake and Fieldbrook-Glendale could receive USDA grants to fund their contributions of construction funds.

Other funding sources may be available if the District can demonstrate that the capital projects will create jobs or stimulate economic activity in the region (i.e. the project is needed to provide reliable water service to industry). The US Economic Development Administration and the California Trade and Commerce Agency offer public infrastructure grants and loans for communities to promote economic development.

14.2.2 Bank Loans/Private Placement Loans

A private placement loan is typically sourced through a commercial bank or leasing company and is generally limited to a 20-year maximum term. The loan is placed through a term sheet and competitive bidding process. Preparation of a bond prospectus or official statement is not needed. The legal documentation is relatively simple and streamlined and issuance costs are kept to a minimum. The legal covenants securing loans are generally similar to those of bonds or COPs.

Bank loans and private placements typically offer slightly higher interest rates than bonds, but also have lower costs of issuance. This has historically made bank loans a cost-effective option for smaller borrowings, historically under $5 million. However, in the current interest rate environment, bank loans may be cost-effective for financings upwards of $10 million depending on the underlying credit of the issuing agency. Short-term bank loans and lines of credit are sometimes used to provide interim financing that will eventually be taken out with long-term debt. For example, agencies with limited fund reserves may use a line of credit to fund project design and preliminary engineering costs prior to issuing long-term bonds when construction bids are received. The current interest rates on a private placement loan vary from about 3.1% for a 5-year loan to about 5.0% for a 20-year loan.

14.2.3 Revenue-Secured COPs

A COP financing is essentially the same as a revenue bond financing, but it is based on a lease-lease back legal structure instead of the Revenue Bond law. The security is the same for both types of borrowings (HBMWD's pledge of revenues), they are rated

identically by the ratings agencies, and they bear the same interest costs in the marketplace. The key difference is that COPs are not considered "debt" under California law and therefore do not require voter authorization. COPs have been commonly used by water and wastewater agencies throughout California since the early 1980's and are well received by investors. COPs issues can have amortization terms of 30 years and longer.

The average interest rates on a COPs issue vary between 1.7% for a 5-year repayment term and 4.7% for a 30 year term. Given our understanding of the District's strengths and weaknesses, we estimate that the District would likely be rated in the single A category by the ratings agencies.

14.3 Debt Service Coverage

Private placement loans and certificates of participation generally require a minimum coverage pledge. Coverage is measured as the ratio of net revenues (i.e., gross revenues less operation and maintenance expenses) to annual debt service. Typically, agencies are required to maintain net revenues of 1.10 to 1.30 times the annual debt services. Consequently, annual revenues must be adequate to fund operating and maintenance expenses plus 110 to 130 percent of annual debt service. For the financial plan, BWA includes a debt service coverage ratio of 120 percent on income from all revenues. Therefore, any rate adjustments must also be designed to ensure adequate coverage.

14.4 Fund Reserves

As of July 1, 2010, the District held total reserves of approximately $2.9 million as shown on Table 8. In March 2011, the Board approved the allocation of the DWFP reserve to fund a portion of the Ranney Collector #3 Replacement and Techite Pipeline Replacement projects planned for FY 2011/12 and FY 2012/13. The proposed debt financing for these projects will be discussed in a later sub-section.

Table 8. Fund Balances

Unrestricted Reserves	
General Fund Reserve	$1,285,962
Total Unrestricted Reserves	$1,285,962
Restricted Reserves	
DWR Reserve Fund for SRF Loan	$547,338
Drinking Water Treatment Facilities (DWFP) Reserve	$695,545
Total Restricted Reserves	$1,242,883
Partially Restricted Reserves	
Municipal Supplemental Reserve Account (MSRA) Reserve	$396,709
Total Partially Restricted Reserves	$396,709
Total Reserves	**$2,925,554**

14.5 Base Year

To determine the cost of service, a test or base year is selected to serve as a baseline for future expenditures and to allocate costs to wholesale customers. The base year for the financial plan is the FY 2010/11 approved budget. To estimate future annual revenue requirements, revenues and expenses are conservatively escalated based on the most-current information available and with input from District staff. The financial plan was developed concurrently as the District was working on the FY 2011/12 budget, and therefore the figures used in the financial plan may differ slightly from the FY 2011/12 budget which will be adopted in July 2011.

14.6 Other Revenues

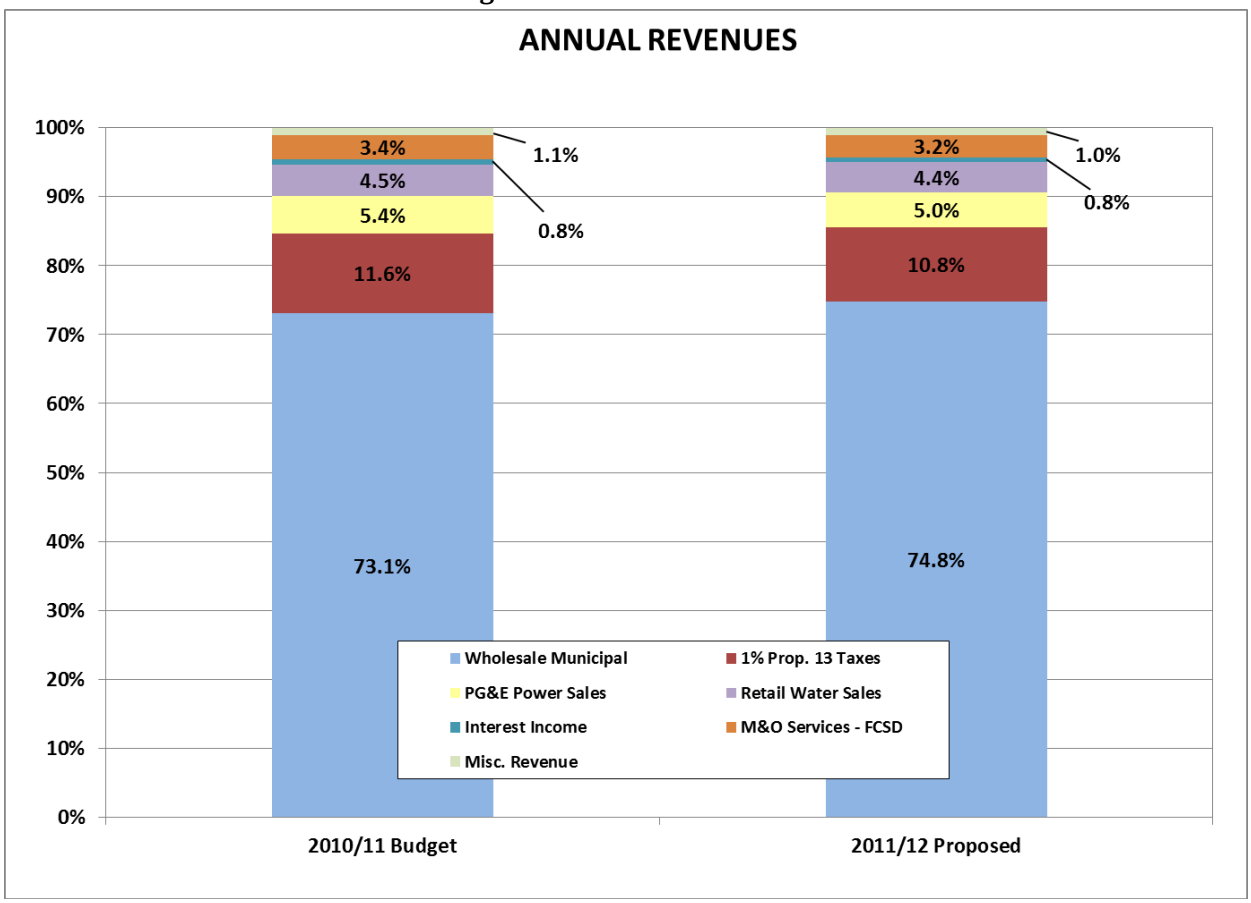
The District's Other Revenues are used as credits to offset the overall expenses charged to the wholesale customers. In FY 2010/11, the District's Other Revenues totaled $1.49 million, accounting for 26 percent of total revenues. The District projects a 2 percent increase in Other Revenues for FY 2011/12 at roughly $1.52 million. Figure 3 shows a breakdown of the District's operating revenues based on the FY 2010/11 budget and FY 2011/12 estimates. Table 9 details the District's Other Revenues through FY 2015/16. A fifteen-year projection through FY 2025/16 is included in Appendix E.

Table 9. Other District Revenues

	Budget	Projected									
	2010/11	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**
Other District Revenues											
1% Prop. 13 Taxes	$640,000	$653,000	$666,000	$679,000	$699,000	$720,000	$742,000	$772,000	$803,000	$835,000	$877,000
Escalation Factor		*2.0%*	*2.0%*	*2.0%*	*3.0%*	*3.0%*	*3.0%*	*4.0%*	*4.0%*	*4.0%*	*5.0%*
PG&E Power Sales	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Escalation Factor		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Retail Water Sales (1)	250,000	265,000	270,000	275,000	281,000	287,000	307,000	313,000	319,000	325,000	332,000
Escalation Factor		*6.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*7.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Interest Income	45,000	46,000	47,000	48,000	49,000	50,000	51,000	52,000	53,000	54,000	55,000
Escalation Factor		*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
M&O Services - FCSD	190,000	194,000	198,000	202,000	206,000	212,000	218,000	225,000	232,000	241,000	251,000
Escalation Factor		*2.0%*	*2.0%*	*2.0%*	*2.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*4.0%*	*4.0%*
Misc. Revenue	60,000	63,000	66,000	69,000	72,000	76,000	80,000	84,000	88,000	92,000	97,000
Escalation Factor		*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Total Other Revenues	$1,485,000	$1,521,000	$1,547,000	$1,573,000	$1,607,000	$1,645,000	$1,698,000	$1,746,000	$1,795,000	$1,847,000	$1,912,000
Percent Change	*-5.7%*	*2.4%*	*1.7%*	*1.7%*	*2.2%*	*2.4%*	*3.2%*	*2.8%*	*2.8%*	*2.9%*	*3.5%*

1 - Rates increased annually based on CPI. Addtionally, rates are increased by 5% every 5 years.

Figure 3. Total Annual Revenues



14.7 Revenue Requirement - Cost of Service

The annual cost of service to the municipal customers is calculated by totaling all expenses and subtracting out the Other Revenues. Table 10 lists the District's yearly expenses including operation and maintenance, advanced charges for capital, contributions to the General Fund, and Maintenance/Reoccurring projects through FY 2020/21. A detailed projection through FY 2025/26 is included in Appendix E. Expenditures for CIP projects and debt service are shown separately.

Table10. Annual Expenses (Does Not Include CIP Projects or Debt Service)

	2010/11	Escalation	Projected									
	Budget	Factor	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Total Salary & Benefits	$2,659,877	5%	$2,792,000	$2,932,000	$3,079,000	$3,233,000	$3,395,000	$3,565,000	$3,743,000	$3,930,000	$4,126,000	$4,332,000
Percent Change	*9.8%*		*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Total Service & Supply (O&M and A&G)	610,800	3%	629,000	648,000	668,000	688,000	708,000	730,000	752,000	774,000	798,000	822,000
Percent Change	*8.6%*		*3.0%*	*3.0%*	*3.1%*	*3.0%*	*2.9%*	*3.1%*	*3.0%*	*2.9%*	*3.1%*	*3.0%*
Total Power	595,000	5%	625,000	657,000	690,000	725,000	761,000	799,000	839,000	881,000	925,000	971,000
Percent Change	*-7.8%*		*5.0%*	*5.1%*	*5.0%*	*5.1%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Maint/Reocc Projects (Dom/Reg System & Indust)	680,800	varies	374,772	568,643	337,990	347,977	$359,198	324,790	321,664	256,817	293,633	727,889
Percent Change	*-65.5%*		*-45.0%*	*51.7%*	*-40.6%*	*3.0%*	*3.2%*	*-9.6%*	*-1.0%*	*-20.2%*	*14.3%*	*147.9%*
Advanced Muni Charges	272,000	0%	0	0	0	0	0	0	0	0	0	0
Percent Change	*444.0%*		*-100.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total Annual Reserve Addition	100,000	0%	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Percent Change	*0.0%*		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
TOTAL EXPENSES (NOT INCL. CIP OR DEBT)	**$4,918,477**		**$4,520,772**	**$4,905,643**	**$4,874,990**	**$5,093,977**	**$5,323,198**	**$5,518,790**	**$5,755,664**	**$5,941,817**	**$6,242,633**	**$6,952,889**
Percent Change	*22.5%*		*-8.1%*	*8.5%*	*-0.6%*	*4.5%*	*4.5%*	*3.7%*	*4.3%*	*3.2%*	*5.1%*	*11.4%*

1 - FY 2011/12 expenses based on projections and may differ from the actual FY 2011/12 budget which will be adopted in May 2011.
2 - Includes Maintenance Projects, Equipment/Fixed Assets, Professional & Consulting Services, and Carryovers for 2009/10 and 2010/11.

14.7.1 Operating Expenses

The District's operating expenses cover the costs incurred to operate and maintain the Domestic/Regional water system and include salary and benefits, service and supplies, and power costs. They total $3.87 million, accounting for 71 percent of all total expenses. Salary and benefits totaled approximately $2.7 million in FY 2010/11 and are escalated by 5 percent annually beginning in FY 2011/12. The Service and Supply category includes operations and maintenance expenses as well as administrative and general expenses (e.g. accounting, legal, insurance, and other overhead costs). For FY 2010/11, Service and Supply costs totaled $610,800, and are assumed to increase by 3 percent each year. Total power costs including the Essex and Korblex accounts are budgeted at $595,000 for FY 2010/11 and are assumed to increase by 5 percent annually.

14.7.2 Addition to General Reserves

Section 7.4 of Ordinance 16 allows the District to budget an annual contribution to the General Fund through Price Factor 4. For FY 2010/11, the allocation for "Addition to General Reserves" is $100,000. Future Additions to Reserves are assumed to remain at $100,000.

14.7.3 Advanced Muni Charges

For capital projects costing more than $200,000, the District may charge the wholesale customers up to three years in advance to spread out the costs per Section 7.2.6 of Ordinance 16. These advanced charges will be held in a separate reserve and can only be used for projects included in the approved budget. In FY 2010/11, the Advanced Muni Charge for the Ranney Collector#3 and lateral replacement project is $272,000. Future advance charges for proposed CIP projects will be determined annually based on capital needs.

14.7.4 Maintenance and Reoccurring Projects

The District's annual Maintenance and Reoccurring Projects provide ongoing repairs and routine maintenance of the Regional/Domestic water system. Maintenance and Reoccurring Projects are estimated at over $5.4 million through FY 2025/26. Annual costs vary but on average range between $300,000 to $500,000 each year.

Maintenance and Reoccurring projects for the Industrial Water System are also incorporated into the total cost of service. Although there are currently no industrial customers, maintaining this system is important at this time given the Water Resource Planning process, and the fact that resumption in service would benefit the municipalities and ratepayers. In turn, future industrial customers (or others who use this system) will pay their fair share of the costs for the Regional/Domestic system. The fifteen-year total for the Industrial System Maintenance and Recurring projects is $248,040. Average yearly expenditures are relatively small, ranging from $13,000 to $15,000.

14.7.5 Capital Improvement/Replacement Projects

As introduced in Chapter 12, the District's CIP is segmented into three infrastructure categories: 1) Regional (i.e. common) and Domestic Water System components, 2) the Industrial Water System components, and 3) the Hydro-Electric plant components. The CIP project costs for all three infrastructure categories totals $69.4 million over the 15-year planning horizon.

The financial plan is only addressing the financing needs for the Regional/Domestic System category. As shown on Table 11 and Figure 4, the District's CIP projects for the Domestic/Regional System total $60.1 million over the planning horizon. In the first five-years (FY 2011-12 through FY 2015/16), Domestic/Regional System projects total $10.7 million. Major projects include Ranney Collector #1 and #3 improvements, the replacement of the Techite Pipeline, and the Blue Lake FG-CSD River Crossing pipeline.

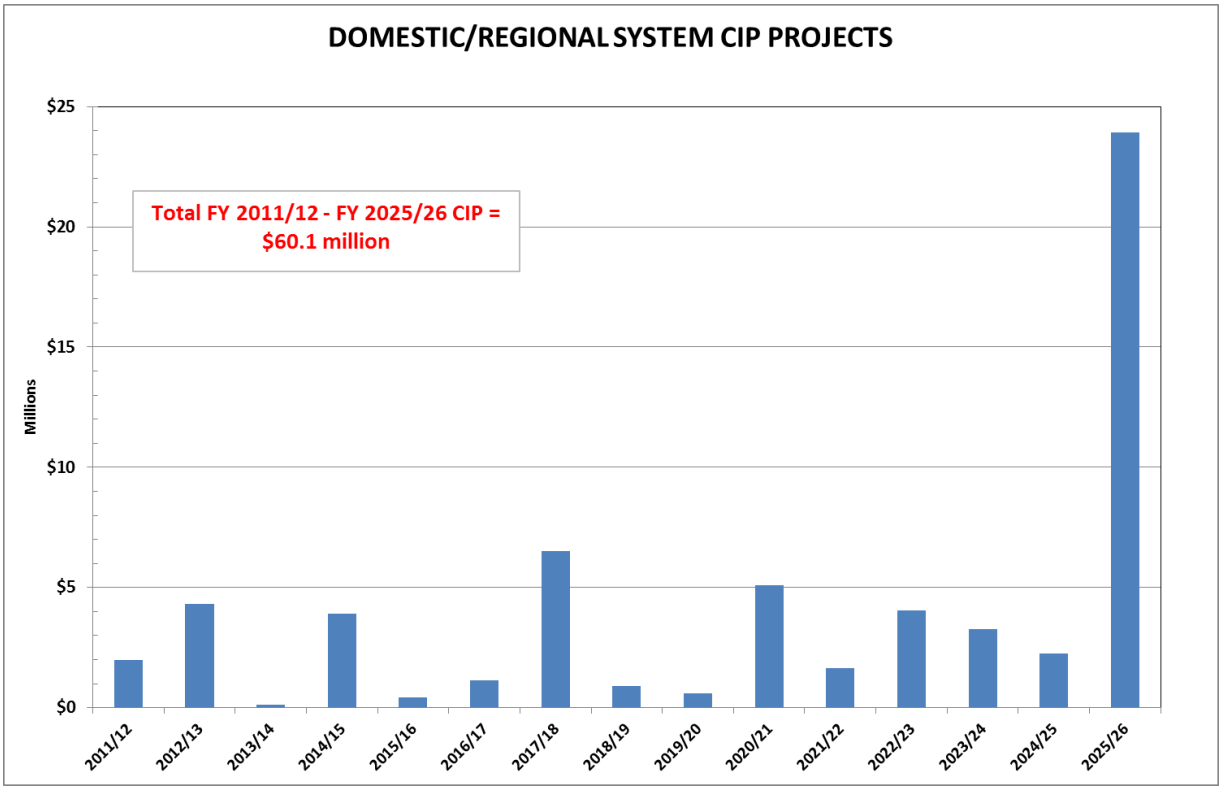
Given the loss of the District's industrial customer base (the pulp mills), the Industrial System CIP projects are not included in the financial plan. Given that the hydro-electric plant is separate and independent from the regional water system, funding for projects at that plant are

not included in the financial plan. Such projects are not essential for the District to meet its service mission (providing water), and the decision criteria for capital replacements are fundamentally different. The District should conduct a focused engineering-economic analysis to determine if investments in the hydro-plant make economic sense for the District and its ratepayers. Funding options for the hydro-electric plant projects are discussed in a later sub-section.

Table 11. Domestic/Regional System and Hydro-Electric System Capital Improvement Replacement Plan (CIP)

	Projected															FY 2012-26
Project	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**Total**
DOMESTIC/REGIONAL SYSTEM																
Source of Supply	$0	$55,591	$0	$0	$0	$134,075	$68,544	$0	$0	$2,377,977	$743,912	$877,488	$89,880	$0	$0	$4,347,467
Diversion and Pumping	1,693,064	249,459	0	1,924,641	0	0	4,402,764	160,370	42,318	637,063	0	1,754,337	2,009,146	1,907,646	2,030,869	16,811,678
Water Treatment	0	881,540	0	0	0	563,248	761,119	164,337	0	0	595,129	1,116,088	80,892	18,745	19,547	4,200,646
Water Storage and Transmission	287,795	3,120,510	0	1,977,727	0	344,408	209,715	386,347	402,875	420,109	307,483	293,056	269,640	281,175	21,884,251	30,185,092
Support Systems for Reg. Water System	0	0	123,418	0	415,266	107,260	1,085,913	176,522	158,684	1,656,337	0	0	808,921	56,235	0	4,588,555
Total Domestic CIP	1,980,859	4,307,101	123,418	3,902,368	415,266	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667	60,133,437
Five-Year Dom./Reg. System Totals					10,729,012					14,259,984					35,144,441	60,133,437
HYDRO-ELECTRIC PLANT																
Hydro-Electric Plant	0	0	763,298	5,548	0	1,983,764	0	0	314,460	458,646	0	0	0	0	0	3,525,717
Total Hydro-Electric CIP	0	0	763,298	5,548	0	1,983,764	0	0	314,460	458,646	0	0	0	0	0	3,525,717
Five-Year Hydro-Electric Totals					768,846					2,756,870					0	3,525,717

Figure 4. Domestic/Regional System CIP



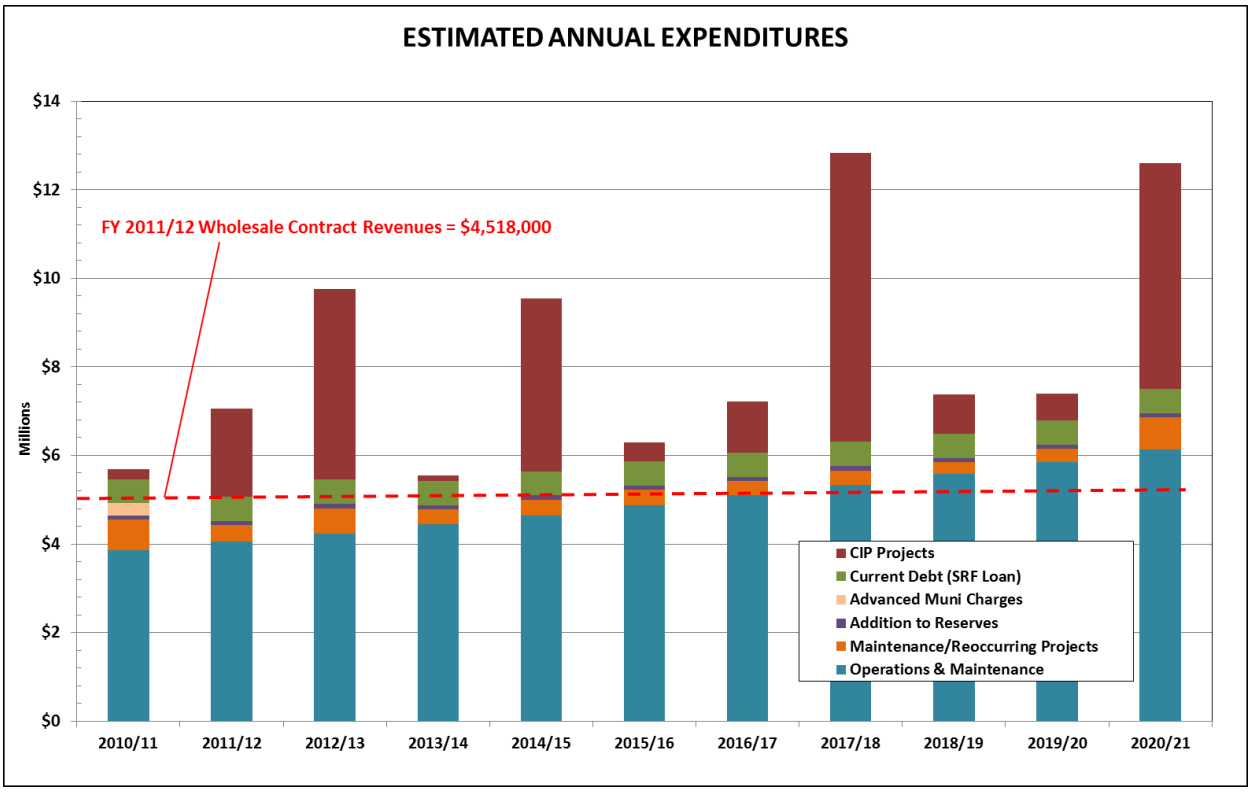
14.7.6 Current Outstanding Debt

The District's only outstanding debt is a $10.9 million loan from the California Department of Water Resources State Revolving Fund (SRF) loan program that was used to finance the Turbidity Reduction Facility and Essex Generator in 2004. The loan carries no interest and has a repayment term of 20 years. The District's current annual debt service payment is $547,337 through FY 2023/24. The debt service is paid in its entirety by the wholesale customers. Future debt obligations to fund CIP projects will be discussed in the next sections.

14.7.7 FY 2011/12 Revenue Requirement

For FY 2010/11, the total wholesale revenue requirement from the seven municipal customers was $4.04 million. Based on the District's preliminary budgeting estimates, the FY 2011/12 total cost of service for the wholesale customers is approximately $4.50 million, an 11.8 percent increase from the previous fiscal year. Figure 5 summarizes the District's projected expenditures through FY 2020/21.

Figure 5. Annual Expenses through FY 2020/21



14.8 Financing for Ranney Collector #3 and Techite Pipeline Replacement

In FY 2011/12, the District will borrow approximately $1.3 million to provide a portion of the funding for the Ranney Collector #3 Lateral Replacement Project and the Techite Pipeline Replacement Project. After evaluating several financing options and recent experience with similar-sized financings for water projects, BWA identified the most attractive borrowing alternative as a competitively bid private placement loan. In July 2011, the District will obtain financing bids for a 10-year private placement loan. Based on an estimated 4.1 percent interest rate, the annual debt service is estimated at $166,000. The District will also use additional funding sources to pay for these projects including a $2 million Federal Emergency Management Agency (FEMA) grant, Advanced Muni Charges, and the DWFP Reserve. The project costs and net funding requirement are summarized in Table 12.

Table 12. Estimated Project Costs and Funding Sources for FY 2011/12 Loan

Ranney Collector #3 Replacement	$1,532,000
Techite Replacement	$2,752,000
Less FEMA Grant	($2,000,000)
less Advance Muni Charges	($272,000)
Less DWFP Reserve	(695,545)
Net Private Placement Loan Proceeds Needed	**$1,316,455**

14.9 Capital Improvement Plan Funding Scenarios

BWA has developed four funding scenarios to fund the capital improvement program and recommends a series of borrowings through FY 2025/26. Each scenario is designed to meet annual revenue requirements, fund CIP projects, build reserves, and provide adequate debt service coverage. The recommended financings will be adjusted in future years as the District updates the CIP. By the time the District is actually ready to borrow the money, the rates and costs of each option may vary somewhat from current levels. Just prior to proceeding with a borrowing, the relative rates and costs should be compared again to determine which financing option is the most economical for the District.

All four scenarios include the private placement loan for $1.3 million in FY 2011/12 to fund the Ranney Collector #3 and Techite Pipeline Replacement projects. Subsequent borrowings are intended to fund two to three years of projects at a time.

Net Revenues Available to Fund CIP Projects

Table 13 shows the net revenues available to fund CIP projects on a pay-as-you-go basis. Total revenues must fund: 1) operating expenses, 2) debt service, and 3) additional revenues to meet debt service coverage. The net revenues are derived by subtracting out all expenses (operating expenses, Maintenance/Reoccurring projects, debt service, and Additions to

Reserves) from total revenues (wholesale contract revenues and Other Revenues). Based on the FY 2011/12 revenue requirement of $4.5 million, the net revenues available to fund CIP projects is nearly $791,000. The District has net revenues available to fund CIP projects through FY 2015/16. It is projected that net revenues will fund approximately $2.1 million of CIP projects over the next five years.

As previously noted, when the District borrows money to fund CIP projects, the District will be required to maintain net revenues of 1.20 times the annual debt service. Beginning in FY 2016/17, the District will need to raise additional revenue to comply with the coverage requirement. The amount of additional revenue needed varies from year to year and will be used as net revenues to fund CIP projects.

The debt coverage ratio is calculated by taking total revenues less operation and maintenance expenses (Salaries and Benefits, Service and Supply, Power, and a portion of the Maintenance and Reoccurring Projects) divided by annual debt service. For the Maintenance and Reoccurring Projects, fleet vehicles and construction equipment projects are considered capital projects, representing 28% of all projects. Therefore, only 72% of the Maintenance and Reoccurring Projects are considered operating expenses and included in the debt service coverage calculation.

Table 13. Net Revenues Available to Fund Domestic/Regional CIP Projects

	Budget	Projected									
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
EXPENSES											
OPERATING EXPENSES											
Salaries/Benefits	$2,659,877	$2,792,000	$2,932,000	$3,079,000	$3,233,000	$3,395,000	$3,565,000	$3,743,000	$3,930,000	$4,126,000	$4,332,000
Service & Supply	610,800	629,000	648,000	668,000	688,000	708,000	730,000	752,000	774,000	798,000	822,000
Power (Including Non-Pumping Costs)	595,000	625,000	657,000	690,000	725,000	761,000	799,000	839,000	881,000	925,000	971,000
Dom./Reg. System Maint./Reocc. Projects	680,800	361,917	555,338	324,220	333,725	344,447	309,522	305,863	240,462	276,706	710,369
Industrial System Maint./Reocc. Projects	0	12,855	13,305	13,770	14,252	14,751	15,267	15,802	16,355	16,927	17,520
Subtotal Operating Expenses	4,546,477	4,420,772	4,805,643	4,774,990	4,993,977	5,223,198	5,418,790	5,655,664	5,841,817	6,142,633	6,852,889
CURRENT DEBT SERVICE											
2004 SRF Loan Debt	547,337	547,337	547,337	547,337	547,337	547,337	547,337	547,337	547,337	547,337	547,337
2011/12 Bank Loan (Ranney #3 & Techite)	0	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Subtotal Debt Service	547,337	727,337	727,337	727,337	727,337	727,337	727,337	727,337	727,337	727,337	727,337
ADDITION TO RESERVES											
Annual Addition to Reserves	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Subtotal Addition to Reserves	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
ADVANCED MUNI CHARGES											
Advanced Muni Charges for CIP Projects	272,000	0	0	0	0	0	0	0	0	0	0
Subtotal Advanced Muni Charges	272,000	0	0	0	0	0	0	0	0	0	0
TOTAL EXPENSES	5,465,814	5,248,109	5,632,980	5,602,327	5,821,314	6,050,535	6,246,127	6,483,001	6,669,154	6,969,970	7,680,226
REVENUES											
OTHER DISTRICT REVENUES											
1% Prop. 13 Taxes	640,000	653,000	666,000	679,000	699,000	720,000	742,000	772,000	803,000	835,000	877,000
PG&E Power Sales	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Retail Water Sales	250,000	265,000	270,000	275,000	281,000	287,000	307,000	313,000	319,000	325,000	332,000
Interest Income	45,000	46,000	47,000	48,000	49,000	50,000	51,000	52,000	53,000	54,000	55,000
M&O Services - FCSD	190,000	194,000	198,000	202,000	206,000	212,000	218,000	225,000	232,000	241,000	251,000
Misc. Revenue	60,000	63,000	66,000	69,000	72,000	76,000	80,000	84,000	88,000	92,000	97,000
Subtotal Other Revenues	1,485,000	1,521,000	1,547,000	1,573,000	1,607,000	1,645,000	1,698,000	1,746,000	1,795,000	1,847,000	1,912,000
Wholesale Contract Revenues	4,042,814	4,518,000	4,518,000	4,518,000	4,518,000	4,518,000	4,548,127	4,737,001	4,874,154	5,122,970	5,768,226
TOTAL REVENUES	5,527,814	6,039,000	6,065,000	6,091,000	6,125,000	6,163,000	6,246,127	6,483,001	6,669,154	6,969,970	7,680,226
NET AVAILABLE FOR CIP PROJECTS (PAY-AS-YOU-GO)											
Revenues Available for CIP	62,000	790,891	432,020	488,673	303,686	112,465	0	0	0	0	0

14.9.1 Scenario #1 (Base Case): Debt Financing

Scenario #1 assumes that the District will utilize debt financing to fund the majority of the CIP projects. The assumptions for Scenario #1 are:

- The District will borrow approximately $1.3 million in FY 2011/12 to fund the Ranney Collector #3 and Techite Pipeline Replacement projects.
- The District will borrow nearly $51 million over the next fifteen years to fund CIP projects.
- The District will obtain a $1.98 million grant to fund the Blue Lake FG-CSD River Crossing Replacement project in FY 2014/15.
- The District will need to raise additional wholesale revenues to meet debt service coverage beginning in FY 2016/17.

The proposed financings for Scenario #1 are outlined in Table 14.

Table 14. Scenario #1: Proposed Debt Financings

No.	Projects based on Fiscal Year	Total Costs	Financing Mechanism	Est. Interest Rate	Term	Est. Annual Debt Service
1	2011/12	$1,312,000	Private Placement Loan	4.1%	10	166,000
2	2012/13 - 2014/15	$3,298,476	Private Placement Loan	5.0%	20	267,000
3	2015/16 - 2017/18	$7,639,847	Private Placement Loan	5.2%	20	626,000
4	2018/19 - 2020/21	$5,807,939	Private Placement Loan	5.5%	20	489,000
5	2020/21 - 2023/24	$7,685,973	Private Placement Loan	5.5%	20	646,000
6	2024/25 - 2025/26	$25,133,468	Certificate of Participation	6.0%	30	1,937,500
	Total	$50,877,703				

Table 15 shows the estimated annual wholesale revenue increases for Scenario #1. A detailed cash flow projection for Scenario #1 is included in Appendix E.

Table 15. Scenario #1: Total Annual Wholesale Revenues Required

	Budget	Projected														
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
CAPITAL IMPROVEMENT PLAN (Table 4)																
Domestic/Regional System CIP	219,000	1,980,859	4,307,101	123,418	3,902,368	415,266	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667
Less Net Revenue Available for CIP (Table 5) (1)	62,000	804,891	446,020	502,673	317,686	126,465	170,000	170,000	300,000	295,000	180,000	420,000	420,000	420,000	420,000	645,000
Less Grant and Reserve Funding																
Grant Funding (2)	0	853,968	1,146,032	0	1,978,000	0	0	0	0	0	0	0	0	0	0	0
DWFP Reserves	0	0	700,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Advanced Muni Charges	0	322,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Grant and Reserve Funding	0	1,175,968	1,846,032	0	1,978,000	0	0	0	0	0	0	0	0	0	0	0
Additional CIP Funding Required	157,000	0	2,015,049	(379,255)	1,606,682	288,802	978,990	6,358,056	587,576	308,876	4,911,486	1,226,524	3,620,969	2,838,480	1,843,801	23,289,667
Proposed Debt Issues (Proceeds)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)		1,312,000														
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)			3,242,476													
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)						7,625,847										
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)									5,807,939							
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)												7,685,973				
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)															25,133,468	
Debt Service (Payments)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)	0	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	0	0	0	0
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)	0	0	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)	0	0	0	0	0	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)	0	0	0	0	0	0	0	0	489,000	489,000	489,000	489,000	489,000	489,000	489,000	489,000
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)	0	0	0	0	0	0	0	0	0	0	0	646,000	646,000	646,000	646,000	646,000
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	968,750	1,937,500
Total New Debt	0	166,000	429,000	429,000	429,000	1,054,000	1,054,000	1,054,000	1,543,000	1,543,000	1,543,000	2,189,000	2,023,000	2,023,000	2,991,750	3,960,500
Wholesale Contract Revenues for Operations (Table 5)	4,042,814	4,518,000	4,518,000	4,518,000	4,518,000	4,518,000	4,534,127	4,723,001	4,860,154	5,108,970	5,754,226	5,675,202	5,574,254	5,804,916	5,770,101	5,968,647
Total Wholesale Contract Revenues Required	**4,042,814**	**4,518,000**	**4,781,000**	**4,781,000**	**4,781,000**	**5,406,000**	**5,592,127**	**5,781,001**	**6,537,154**	**6,780,970**	**7,311,226**	**8,118,202**	**8,017,254**	**8,247,916**	**9,181,851**	**10,574,147**
$ Change	*623,424*	*475,186*	*263,000*	*0*	*0*	*625,000*	*186,127*	*188,875*	*756,152*	*243,817*	*530,255*	*806,976*	*(100,947)*	*230,662*	*933,934*	*1,392,296*
% Change	*18.2%*	*11.8%*	*5.8%*	*0.0%*	*0.0%*	*13.1%*	*3.4%*	*3.4%*	*13.1%*	*3.7%*	*7.8%*	*11.0%*	*-1.2%*	*2.9%*	*11.3%*	*15.2%*
Debt Service Coverage (Min. 1.20x)	n/a	2.41	1.72	1.71	1.52	1.20	1.22	1.22	1.22	1.23	1.23	1.23	1.23	1.23	1.22	1.22
Target Met	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*

1 - Net revenues beginning in FY 2015/16 are based on additional revenues needed to meet debt service coverage requirements.
2 - Grant funding for FY 2011/12 and FY 2012/13 is based on $2 million FEMA Hazard Mitigation Grant. Assumes $1,978,000 grant funding for the entire Blue Lake FG-CSD River Crossing Replacement project.

14.9.1(a) Scenario #1a: Debt Financing - $700,000 Grant for Blue Lake FG-CSD Project

Scenario #1a is similar to Scenario #1 in that the District will utilize debt financing to fund the majority of the CIP projects. However, Scenario #1a only includes grant funding for a portion of the Blue Lake FG-CSD project in FY 2014/15. The assumptions for Scenario #1a are:

- The District will borrow approximately $1.3 million in FY 2011/12 to fund the Ranney Collector #3 and Techite Pipeline Replacement projects.
- The District will borrow nearly $52.2 million over the next fifteen years to fund CIP projects.

- The District will obtain a $700,000 grant to fund the Blue Lake FG-CSD River Crossing Replacement project in FY 2014/15.
- The District will need to raise additional wholesale revenues to meet debt service coverage beginning in FY 2016/17.

The proposed financings for Scenario #1a are outlined in Table 16.

Table 16. Scenario #1a: Proposed Debt Financings

No.	Projects based on Fiscal Year	Total Costs	Financing Mechanism	Est. Interest Rate	Term	Est. Annual Debt Service
1	2011/12	$1,312,000	Private Placement Loan	4.1%	10	166,000
2	2012/13 - 2014/15	$4,576,476	Private Placement Loan	5.0%	20	370,000
3	2015/16 - 2017/18	$7,639,847	Private Placement Loan	5.2%	20	626,000
4	2018/19 - 2020/21	$5,807,939	Private Placement Loan	5.5%	20	489,000
5	2020/21 - 2023/24	$7,685,973	Private Placement Loan	5.5%	20	646,000
6	2024/25 - 2025/26	$25,133,468	Certificate of Participation	6.0%	30	1,937,500
	Total	$52,155,703				

Table 17 shows the estimated annual wholesale revenue increases for Scenario #1a. A detailed cash flow projection for Scenario #1a is included in Appendix E.

Table 17. Scenario #1a: Total Annual Wholesale Revenues Required

	Budget	Projected														
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
CAPITAL IMPROVEMENT PLAN (Table 4)																
Domestic/Regional System CIP	219,000	1,980,859	4,307,101	123,418	3,902,368	415,266	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667
Less Net Revenue Available for CIP (Table 5) (1)	62,000	804,891	446,020	502,673	317,686	156,465	170,000	170,000	300,000	295,000	180,000	420,000	420,000	420,000	420,000	645,000
Less Grant and Reserve Funding																
Grant Funding (2)	0	853,968	1,146,032	0	700,000	0	0	0	0	0	0	0	0	0	0	0
DWFP Reserves	0	0	700,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Advanced Muni Charges	0	322,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Grant and Reserve Funding	0	1,175,968	1,846,032	0	700,000	0	0	0	0	0	0	0	0	0	0	0
Additional CIP Funding Required	157,000	0	2,015,049	(379,255)	2,884,682	258,802	978,990	6,358,056	587,576	308,876	4,911,486	1,226,524	3,620,969	2,838,480	1,843,801	23,289,667
Proposed Debt Issues (Proceeds)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)		1,312,000														
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)			4,520,476													
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)						7,595,847										
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)									5,807,939							
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)												7,685,973				
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)															25,133,468	
Debt Service (Payments)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)	0	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	0	0	0	0
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)	0	0	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000	365,000
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)	0	0	0	0	0	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000	625,000
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)	0	0	0	0	0	0	0	0	489,000	489,000	489,000	489,000	489,000	489,000	489,000	489,000
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)	0	0	0	0	0	0	0	0	0	0	0	646,000	646,000	646,000	646,000	646,000
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	968,750	1,937,500
Total New Debt	0	166,000	531,000	531,000	531,000	1,156,000	1,156,000	1,156,000	1,645,000	1,645,000	1,645,000	2,291,000	2,125,000	2,125,000	3,093,750	4,062,500
Wholesale Contract Revenues for Operations (Table 5)	4,042,814	4,518,000	4,518,000	4,518,000	4,518,000	4,518,000	4,534,127	4,723,001	4,860,154	5,108,970	5,754,226	5,675,202	5,574,254	5,804,916	5,770,101	5,968,647
Total Wholesale Contract Revenues Required	**4,042,814**	**4,518,000**	**4,883,000**	**4,883,000**	**4,883,000**	**5,538,000**	**5,694,127**	**5,883,001**	**6,639,154**	**6,882,970**	**7,413,226**	**8,220,202**	**8,119,254**	**8,349,916**	**9,283,851**	**10,676,147**
$ Change	*623,424*	*475,186*	*365,000*	*0*	*0*	*655,000*	*156,127*	*188,875*	*756,152*	*243,817*	*530,255*	*806,976*	*(100,947)*	*230,662*	*933,934*	*1,392,296*
% Change	*18.2%*	*11.8%*	*8.1%*	*0.0%*	*0.0%*	*13.4%*	*2.8%*	*3.3%*	*12.9%*	*3.7%*	*7.7%*	*10.9%*	*-1.2%*	*2.8%*	*11.2%*	*15.0%*
Debt Service Coverage (Min. 1.20x)	n/a	2.41	1.65	1.64	1.47	1.21	1.21	1.21	1.21	1.22	1.22	1.23	1.22	1.22	1.22	1.22
Target Met	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*

1 - Net revenues beginning in FY 2015/16 are based on additional revenues needed to meet debt service coverage requirements.
2 - Grant funding for FY 2011/12 and FY 2012/13 is based on $2 million FEMA Hazard Mitigation Grant. Assumes $700,000 grant funding for the entire Blue Lake FG-CSD River Crossing Replacement project.

14.9.2 Scenario #2: 75% Debt Financing / 25% Grant Financing

Scenario #2 assumes that 75 percent of the CIP will be funded by debt while 25 percent will be grant funded. The District has successfully obtained grant funding in the past and therefore, it is likely the District will continue to secure some grant funding in the future. The assumptions for Scenario #2 are:

- The District will borrow approximately $1.3 million in FY 2011/12 to fund the Ranney Collector #3 and Techite Pipeline Replacement projects.
- The District will borrow nearly $39.5 million over the next fifteen years to fund CIP projects.
- The District will obtain a $1.98 million grant to fund the Blue Lake FG-CSD River Crossing Replacement project in FY 2014/15.
- The District will need to raise additional wholesale revenues to meet debt service coverage beginning in FY 2016/17.

The proposed financings for Scenario #2 are outlined in Table 18.

Table 18. Scenario #2: Proposed Debt Financings

No.	Projects based on Fiscal Year	Total Costs	Financing Mechanism	Est. Interest Rate	Term	Est. Annual Debt Service
1	2011/12	$1,312,000	Private Placement Loan	4.1%	10	166,000
2	2012/13 - 2014/15	$3,298,476	Private Placement Loan	5.0%	20	267,000
3	2015/16 - 2017/18	$5,673,769	Private Placement Loan	5.2%	20	466,000
4	2018/19 - 2020/21	$4,372,204	Private Placement Loan	5.5%	20	368,000
5	2020/21 - 2023/24	$5,839,479	Private Placement Loan	5.5%	20	491,000
6	2024/25 - 2025/26	$18,938,851	Certificate of Participation	6.0%	30	1,462,200
	Total	$39,434,780				

Table 19 shows the estimated annual wholesale revenue increases for Scenario #2. A detailed cash flow projection for Scenario #2 is included in Appendix E.

Table 19. Scenario #2: Total Annual Wholesale Revenues Required

	Budget	Projected														
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
CAPITAL IMPROVEMENT PLAN (Table 4)																
Domestic/Regional System CIP	219,000	1,980,859	4,307,101	123,418	3,902,368	415,266	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667
Less Net Revenue Available for CIP (Table 5) (1)	62,000	804,891	446,020	502,673	317,686	126,465	140,000	143,000	230,000	220,000	115,000	290,000	290,000	290,000	260,000	450,000
Less Grant and Reserve Funding																
Grant Funding (2)	0	853,968	1,146,032	0	1,978,000	103,817	287,248	1,632,014	221,894	150,969	1,272,872	411,631	1,010,242	814,620	565,950	5,983,667
DWFP Reserves	0	0	700,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Advanced Muni Charges	0	322,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Grant and Reserve Funding	0	1,175,968	1,846,032	0	1,978,000	103,817	287,248	1,632,014	221,894	150,969	1,272,872	411,631	1,010,242	814,620	565,950	5,983,667
Additional CIP Funding Required	157,000	0	2,015,049	(379,255)	1,606,682	184,985	721,743	4,753,042	435,682	232,907	3,703,615	944,893	2,740,727	2,153,860	1,437,851	17,501,000
Proposed Debt Issues (Proceeds)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)		1,312,000														
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)			3,242,476													
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)						5,659,769										
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)									4,372,204							
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)												5,839,479				
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)															18,938,851	
Debt Service (Payments)																
1). 2011/12 Bank Loan (Techite & Collector 3 Projects)	0	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	166,000	0	0	0	0
2). 2012/13 Bank Loan (2012/13 - 2014/15 Projects)	0	0	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000	263,000
3). 2015/16 Bank Loan (FY 2015/16- 2017/18 Projects)	0	0	0	0	0	464,000	464,000	464,000	464,000	464,000	464,000	464,000	464,000	464,000	464,000	464,000
4). 2018/19 Bank Loan (FY 2018/19 -2020/21 Projects)	0	0	0	0	0	0	0	0	368,000	368,000	368,000	368,000	368,000	368,000	368,000	368,000
5). 2021/22 Bank Loan (FY 2020/21 -2023/24 Projects)	0	0	0	0	0	0	0	0	0	0	0	491,000	491,000	491,000	491,000	491,000
6). 2024/25 COP (FY 2024/25 - 2025/26 Projects)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	731,100	1,462,200
Total New Debt	0	166,000	429,000	429,000	429,000	893,000	893,000	893,000	1,261,000	1,261,000	1,261,000	1,752,000	1,586,000	1,586,000	2,317,100	3,048,200
Wholesale Contract Revenues for Operations (Table 5)	4,042,814	4,518,000	4,518,000	4,518,000	4,518,000	4,518,000	4,534,127	4,723,001	4,860,154	5,108,970	5,754,226	5,675,202	5,574,254	5,804,916	5,770,101	5,968,647
Total Wholesale Contract Revenues Required	**4,042,814**	**4,518,000**	**4,781,000**	**4,781,000**	**4,781,000**	**5,245,000**	**5,401,127**	**5,593,001**	**6,185,154**	**6,423,970**	**6,964,226**	**7,551,202**	**7,450,254**	**7,680,916**	**8,347,201**	**9,466,847**
$ Change	*623,424*	*475,186*	*263,000*	*0*	*0*	*464,000*	*156,127*	*191,875*	*592,152*	*238,817*	*540,255*	*586,976*	*(100,947)*	*230,662*	*666,284*	*1,119,646*
% Change	*18.2%*	*11.8%*	*5.8%*	*0.0%*	*0.0%*	*9.7%*	*3.0%*	*3.6%*	*10.6%*	*3.9%*	*8.4%*	*8.4%*	*-1.3%*	*3.1%*	*8.7%*	*13.4%*
Debt Service Coverage (Min. 1.20x)	n/a	2.41	1.72	1.71	1.52	1.22	1.23	1.23	1.22	1.22	1.23	1.22	1.22	1.22	1.22	1.23
Target Met	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*

1 - Net revenues beginning in FY 2015/16 are based on additional revenues needed to meet debt service coverage requirements.
2 - Grant funding for FY 2011/12 and FY 2012/13 is based on $2 million FEMA Hazard Mitigation Grant. Assumes $1,978,000 grant funding for the entire Blue Lake FG-CSD River Crossing Replacement project.

14.9.3 Scenario #3: Pay-As-You-Go

Scenario #3 assumes no debt financing for the Domestic/Regional CIP except for the $1.4 million loan in FY 2011/12 and that all CIP projects will be paid for on a pay-as-you-go basis. The total wholesale revenue requirement fluctuates widely from year to year due to the annual variability of the CIP. The assumptions for Scenario #3 are:

- The District will borrow approximately $1.3 million in FY 2011/12 to fund the Ranney Collector #3 and Techite Pipeline Replacement projects.
- Wholesale contract revenues will pay for all annual CIP project costs.
- The District will obtain a $1.98 million grant to fund the Blue Lake FG-CSD River Crossing Replacement project in FY 2014/15.

Table 20 shows the estimated annual wholesale revenue increases for Scenario #3. A detailed cash flow projection for Scenario #3 is included in the Appendix E.

Table 20. Scenario #3: Total Annual Wholesale Revenues Required

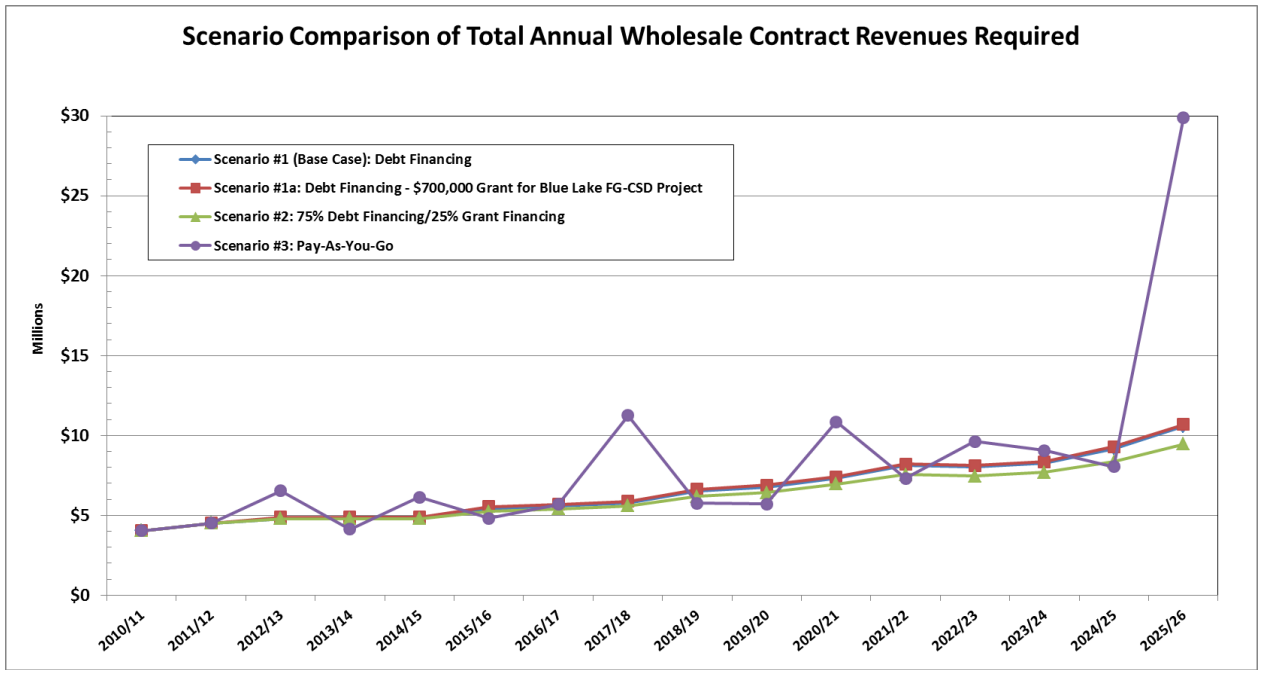
	Budget	Projected														
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
CAPITAL IMPROVEMENT PLAN (Table 4)																
Domestic/Regional System CIP	219,000	1,980,859	4,307,101	123,418	3,902,368	415,266	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667
Less Net Revenue Available for CIP (Table 5)	62,000	804,891	446,020	502,673	317,686	126,465	0	0	0	0	0	0	0	0	0	0
Less Grant and Reserve Funding																
Grant Funding (1)	0	853,968	1,146,032	0	1,978,000	0	0	0	0	0	0	0	0	0	0	0
DWFP Reserves	0	0	700,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Advanced Muni Charges	0	322,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Grant and Reserve Funding	0	1,175,968	1,846,032	0	1,978,000	0	0	0	0	0	0	0	0	0	0	0
Additional Pay-As-You-Go CIP funding Required		0	2,015,049	(379,255)	1,606,682	288,802	1,148,990	6,528,056	887,576	603,876	5,091,486	1,646,524	4,040,969	3,258,480	2,263,801	23,934,667
Wholesale Contract Revenues for Operations (Table 5)	4,042,814	4,518,000	4,518,000	4,518,000	4,518,000	4,518,000	4,534,127	4,723,001	4,860,154	5,108,970	5,754,226	5,675,202	5,574,254	5,804,916	5,770,101	5,968,647
Total Wholesale Contract Revenues Required	**4,042,814**	**4,518,000**	**6,533,049**	**4,138,745**	**6,124,682**	**4,806,802**	**5,683,117**	**11,251,057**	**5,747,730**	**5,712,846**	**10,845,712**	**7,321,726**	**9,615,223**	**9,063,396**	**8,033,902**	**29,903,314**
$ Change	*623,424*	*475,186*	*2,015,049*	*(2,394,304)*	*1,985,938*	*(1,317,881)*	*876,315*	*5,567,940*	*(5,503,327)*	*(34,883)*	*5,132,865*	*(3,523,986)*	*2,293,497*	*(551,827)*	*(1,029,494)*	*21,869,412*
% Change	*18.2%*	*11.8%*	*44.6%*	*-36.6%*	*48.0%*	*-21.5%*	*18.2%*	*98.0%*	*-48.9%*	*-0.6%*	*89.8%*	*-32.5%*	*31.3%*	*-5.7%*	*-11.4%*	*272.2%*

1 - Grant funding for FY 2011/12 and FY 2012/13 is based on $2 million FEMA Hazard Mitigation Grant. Assumes $1,978,000 grant funding for the entire Blue Lake FG-CSD River Crossing Replacement project.

14.9.4 Scenario Comparison

Figure 6 compares the four scenarios and the annual wholesale contract revenues required to fund the District's operating and capital expenditures. With debt and grant financing, Scenarios #1, #1a, and #2 show smaller, steady fluctuations in revenue needs. Scenario #3 results in larger revenue spikes as CIP projects are funded on a cash basis each year.

Figure 6. Scenario Comparison



14.10 Reserve Recommendation

The District is allowed to maintain General Reserves pursuant to its Ordinance 16 contracts, and doing so is prudent and recommended. If the General Reserve balance falls below a certain threshold, the District may charge its wholesale customers "Additions to General

Reserves" (via Price factor 4) up to $350,000 per year. The contract does not impose limitations regarding how the District may use its General Reserves.

In July 2009, the Board approved a Reserve Policy that established a maximum allowable General Fund Reserve balance of $4 million, and segmented total reserves into three categories – restricted, partially-restricted, and unrestricted.

After a review of the District's operating expenditures, BWA recommends that the District aim to maintain a General Reserve target of $4 million as outlined in the 2009 Reserve Policy, essentially equivalent to one year of operating and maintenance expenditures (based on the FY 2011/12 budget). This is considered to be a prudent level of reserves that provides an adequate financial cushion for dealing with annual revenue and expense fluctuations, emergencies, and other unforeseen funding needs.

However, in reality increasing the annual addition to the General Fund reserve is difficult as the District strives to keep expenditures down and minimize the impact on the wholesale customers. The District should aim to maintain at least a minimum General Fund reserve of $2 million, equal to 50 percent of annual operating and maintenance expenses. BWA recommends that the District continue to include $100,000 for the "Additions to Reserves" and to gradually increase the reserve amount to $4 million when possible.

14.11 Hydro-Electric Capital Projects

The fifteen-year Capital improvement program includes about $3.5 million in hydro-electric projects. The District currently does not have a dedicated funding stream to fund the hydro-electric capital projects. Revenues from PG&E power sales are estimated at $300,000 annually. Power sales are the second largest source of "Other Revenues," accounting for roughly 19.7% of all "Other Revenues." The wholesale contracts restrict the use of all "Other Revenues" that the District receives, including power sales. All "Other Revenues" are credited back to the wholesale customers to offset their overall costs.

Annual revenues from power sales vary widely based on hydrological conditions and are therefore difficult to forecast. However, there are various options that the District could consider to increase hydro revenues, such as selling the power to other agencies and utilizing renewable energy credits. An in-depth cost benefit study of the hydro-electric plant is recommended to evaluate the viability of the plant and possible funding sources to make the hydro-electric facility a self-supporting enterprise.

To fund hydro-electric capital projects, BWA always first recommends applying for low-cost State and Federal loans and grants, such as the California Energy Commission which funds projects up to $3 million at 3 percent interest for energy efficiency and renewable energy generation projects. The Commission also provides incentive payments for renewable energy

production on a $ per kWh basis. Payments are made through the Self-Generation Incentive Program and the funding allocations for different types of renewables vary from year to year. Pacific Gas and Electric also provides funding and technical assistance for the design of energy efficient construction or retrofit projects. Funds are typically provided on a $ per fixture basis or based on a lump sum payment for a whole system or facility design.
Another initial possibility is to dedicate the revenues from power sales to solely fund hydro-electric projects when the District renegotiates the current wholesale contracts. Diverting these revenues, however, would result in an increase in the overall revenue requirement for the wholesale customers. Table 8 details the hydro-electric CIP projects and demonstrates how power sales revenues could be used to fund the FY 2011/12 – FY 2025/26 hydro-electric capital improvement plan. Over the fifteen-year period, if the District were to collect $300,000 each year from power sales, the District would accumulate approximately $4.5 million. Combined with additional grant funding or low-cost loan funding opportunities, the District could fund hydro-electric capital projects with revenues from power sales, making it a self-sustaining enterprise.

15. NEXT STEPS

This CIP was developed to establish Board policies and to develop a framework for capital improvements to the regional water system to ensure the system reliably meets our communities' water supply needs for many years to come.

This CIP will be used to identify necessary capital improvement or replacement projects, and to coordinate the financing and timing of these projects with the District's municipal customers. This plan is intended to be a "living document." It will be updated based on new or changing needs, and new or updated information about the condition of the District's infrastructure. The project inventory lists will be maintained as part of the District's annual budget process, since actual project implementation will undoubtedly vary compared to that which is in this original plan.

Implementation of this plan – and in particular timing of specific CIP projects – will be contingent on the ability of the District to fund and finance the projects in a manner that our municipal customers themselves can fund via rates.

The District suggests the following steps to communicate the results and recommendations and initiate implementation activities:

1. Share the plan, and solicit questions and input from the District's municipal customers – staff first, then the Water Task Force, and at appropriate time full Boards/Councils;

2. Share the plan with any other interested parties/stakeholders;

3. In consultation with the District's Municipal Customers, consider establishing a workgroup to support implementation activities. This group could be comprised of staff at the respective agencies, the Water Task Force, or an independent workgroup which receives support and direction from the District and Water Task Force. This suggestion is modeled after the work completed by the Water Task Force to investigate options and make a recommendation regarding how to address the State's mandate to address the occasional winter-time turbidity in the source water. The work completed by the Water Task Force was instrumental in addressing that issue and supported eventual construction of the Turbidity Reduction Facility. The workgroup could consider:
    - Timing and coordination of projects (for District and municipal-level projects too)
    - Ratepayer implications
    - Financing options
    - Possible modification to the wholesale water contracts

4. Develop and implement a communication and outreach plan with a consistent message over time (probably years). Develop specific communication tools and messages. (*Reference ACWA's Toolkit, Appendix I, as well as the communication material developed by the American Water Works Association)*

5. And in-parallel:

    - continue to advance the highest priority projects, similar to that which the District did for the Ranney Collector 3 Lateral Replacement project and Techite Replacement Project when this plan was under development.

    - stay abreast of grant programs which may fund eligible projects, and pursue grant funding to the greatest extent possible.

Appendices

Work Products Developed as part of this CIP:

Appendix A – Maintenance and Reoccurring Projects (through 2025/26)

Appendix B – Capital Improvement/Replacement Projects (through 2025/26)

Appendix C – Subset of the Capital Improvement/Replacement Projects (those for the Regional/Domestic System) sorted by cost (highest to lowest)

Appendix D - Project Worksheets for CIP Projects proposed in first 5 years

Appendix E – Financial Plan

Supporting and Reference Material:

Appendix F - List of Infrastructure and Project-related Engineering Studies

Appendix G – Summary of Potential Water System Loan and Grant programs

Appendix H - Asset Management: A Handbook for Small Water Systems, United States Environmental Protection Agency

Appendix I – Communication Toolkit, Association of California Water Agencies

Plan Maintenance Going Forward

Appendix J – Updated Maintenance and Reoccurring Projects ***(file current list here)***

Appendix K – Updated Capital Improvement/Replacement Project ***(file current list here)***