2022 Non-Potable Water Master Plan

JUNE 2022

BEAUMONT-CHERRY VALLEY WATER DISTRICT

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Section 1

Background, Service Area Characteristics, and Overview of District Facilities

The Non-Potable Master Plan

The purpose of this Non-Potable Water Master Plan is to update the facility requirements for non-potable water supply, transmission, booster pumping, and storage between now and build-out for each pressure zone. An estimate of the cost of each of these facility needs is included.

Past master plans did not have ready access to non-potable water demand data, so facility requirements were determined from rough estimates. This Master Plan takes advantage of the District's new customer billing system which has been updated to include the pressure zone for each customer service. Demands can now be easily aggregated by pressure zone. Also the non-potable water customers are billed monthly so the impacts of peak usage can more easily be determined. The District is currently working through an automated meter reading and automated metering infrastructure (AMR/AMI) conversion to allow for the potential to read meters on a more frequent period, if desired.

Growth in non-potable water demand in this Master Plan is based on developer specific plans and tentative tract maps which have been submitted to the City of Beaumont (City) and Beaumont Cherry Valley Water District (BCVWD). Typically, school and park sites are generally identified and based on the area and the watering requirement, an estimate of the recycled water was be made. The impacts of new landscaping requirement will need to be considered when projecting demands. BCVWD is noticing the impacts of new landscaping designs on schools and common areas.

This Master Plan will provide "snapshots" of facility requirements, including costs, not only at build-out, but also at each five-year interval through the year 2045. The costs will form the basis for adjustments to BCVWD's Facilities Fees (New Development Impact Fees) and future water rate studies.

This Master Plan is intended to serve as a general guidance document for the Board, management, and staff. Developers can use it to provide preliminary estimates of facility needs to serve their projects; other local agencies can use the plan to coordinate facilities.

As with any master plan, maps, figures, and text descriptions of facility locations show or describe only the general location of facilities to guide the District's Board and staff in establishing requirements for specific projects and developments. It is anticipated that some adjustments and modifications to the plan will be made as development in the service area occurs.

The projects identified in this non-potable water master plan would be installed by the developers, by the District, or a combination of the two. These projects would be funded through a wide variety of financial vehicles, e.g., community facility district (CFD) bonds, loans and grants, pay as you go, private development funds, impact fees, etc. These facilities will be constructed either as part of other projects or separately. Appropriate environmental documentation will be provided at the time the projects are proposed for implementation either by the District or by the developers who actually construct these facilities.

Beaumont Cherry Valley Water District - Background

BCVWD dates back to the latter part of the 1800's when the Southern California Investment Company was the owner of the land that currently is the City of Beaumont and the Community of Cherry Valley. In March 1919, the Beaumont Irrigation District was formed by a vote of the people under California Irrigation District Law, Water Code Section §20500 *et seq*. The name was changed to the Beaumont Cherry Valley Water District in 1973 and provides potable water to both agricultural irrigation customers and municipal (domestic) water customers.

Beaumont and Cherry Valley remained small, growing gradually. In 1964 the District had a reported population of 5,934 in Beaumont and 3,072 in Cherry Valley for a total of 9,006 people.[1] The populations of Beaumont and Cherry Valley in 1980 were 6,818 and 5,012 respectively bringing the total population to 11,830. The boom of the early 2000s, saw Beaumont's population to skyrocket to 36,837 by 2010; Cherry Valley showed only limited growth to 6,279 during that same time period. During that time, (2000-2010), Beaumont was the fifth fastest growing city in the US according to the US Census Bureau. The current (2020) population served by the District is approximately 59,000 as reported in BCVWD's 2020 Urban Water Management Plan (UWMP).

The population served by the District is expected to increase 60% by 2045. The City of Beaumont's latest General Plan, adopted in 2020, had a projected build-out population of 134,000[2]. The build out population within the District's Sphere of Influence (SOI) is estimated to be about 147,620 based on BCVWD estimates of land use and average development density.

This master plan addresses only the non-potable water system; a separate master plan has been prepared for the potable water system (2016).

[1] State of California, Department of Water Resources (1965). Irrigation and Water Storage Districts in California: 1964, Bulletin 21-64, December.

[2] Calculated based on City of Beaumont General Plan (2020), Table 3.2a, Page 45. Based on Riverside County average household size of 3.28 people/household.

Previous Planning Efforts

As early as 1987, BCVWD discussed the use of recycled water with the City of Beaumont and the SGPWA as a water source to supplement the District's water supply. The intent of these initial discussions was to determine if implementation of an area-wide recycled water system would be feasible. In June 1989, BCVWD prepared an internal memorandum of the potential for using recycled water in the San Gorgonio Pass Area. The report discussed the installation and operation of a conceptual project which included treatment facilities serving the cities of Banning and Beaumont and conceptual alignments for recycled water distribution and storage facilities. A Joint Powers Agency was envisioned; surplus recycled water was proposed to be percolated into the ground for recharge. In August of 1989, the cities of Beaumont and Banning, along with BCVWD, sent letters to the SGPWA to have the SGPWA take the lead in the conceptual recycled water project. The SGPWA, BCVWD, and the City of Beaumont entered into a Water Facilities Master Plan Cooperative Agreement on March 15, 1993 for the purpose of providing supplemental water from the State Water Project and financing those facilities to meet BCVWD's needs to meet the anticipated water supply requirements of the City of Beaumont. The Cooperative Agreement recognized that the SGPWA believed that "water reclamation and water conservations are important water development programs that can extend limited imported and local water supplies."[3]

At approximately this same time, there was increasing pressure for development in the Beaumont area with the Landmark's Oak Valley Project, which actually extended from YVWD's service area into Beaumont and covered the areas of Oak Valley Greens, Fairway Canyon, Tournament Hills and the Tukwet Golf Course. The City of Beaumont acknowledged their wastewater treatment facility would need to be upgraded and expanded to accommodate the proposed growth. In the early 1990s, BCVWD and the City of Beaumont took the lead on conceptual planning for a regional wastewater treatment and water recycling facility in San Timoteo Canyon in the vicinity of San Timoteo Canyon Road and Singleton Road with continued use of the City's existing plant as a satellite reclamation plant. Having a new regional plant in San Timoteo Canyon appeared sound since this the location was downstream from the major planned growth area in Beaumont and most of the service area could flow by gravity to the site. This regional treatment and recycling project, however, was not considered further; the City decided to upgrade and expand their existing wastewater treatment facility.

In 1993, BCVWD and the City of Beaumont entered into a memorandum of understanding (MOU) to establish a Community Facilities District (CFD) in the City of Beaumont to sell bonds to finance wastewater, potable water, and recycled water facilities to accommodate the projected growth in the area. The 1993 MOU also included a provision that the City of Beaumont would pass an ordinance mandating the use of recycled water according to State

[3] SGPWA (1993). San Gorgonio Pass Water Agency Water Facilities Master Plan Cooperative Agreement, March 15.

law. There was also a provision to prepare potable and non-potable water master plans. This original MOU was amended several times over the years.

In October 1997, the City of Beaumont passed a series of ordinances related to recycled water:

Ordinance No.	Title
772	Requiring Conservation of Water in Accordance with the Adopted Beaumont Cherry Valley Water District Urban Water Plan and Recycled Water Master Plan
773	Requiring the use of Recycled or Reclaimed Water in Accordance with State Law
775	Establishing Service Charges and Fees for Recycled or Reclaimed Water in the City of Beaumont and the City Sphere of Influence

Ordinance 775 assumed the City of Beaumont would be implementing the recycled water system and overseeing the on-site use of recycled water. It contained the on-site recycled water use regulations. Since that time, BCVWD his implemented the recycled water system funded in part through CFD 93-1, established by the City to fund recycled water infrastructure for new development.

Master Planning

Prior to adoption of the current Potable Water Master Plan in January 2016, the prior “official” update to the Water System Master Plan was in 1994, an outgrowth of the 1993 MOU; it contained a single section on recycled water. In the late 1990s, BCVWD envisioned a recycled water system which would serve recycled water from the City of Beaumont’s Wastewater Treatment Plant to schools, parks, medians, and common areas within Beaumont. Initial planning included a recycled transmission pipe loop around the City of Beaumont with a recycled water storage tank at the site of what is now the District’s Groundwater Recharge Site on the east side of Beaumont Ave., between Brookside Ave. and Cherry Valley Blvd. The plan also required developers to install recycled water pipelines throughout their subdivisions and design landscape irrigation systems to comply with SWRCB Division of Drinking Water (DDW), formerly the California Department of Public Health (CDPH), recycled water requirements. Figures 7-3A and 7-3B in the 1994 Water System Master Plan, showing the recycled water system, were updated from time to time, the last formal revision was dated January 2003.

The Three Rings Ranch Development, about the year 2002, was the first development to incorporate (non-potable) recycled water transmission and distribution mains with the ultimate intent of using recycled water for irrigation of common areas. Since that time, the non-potable water system has been extended to all of the new developments in the City of Beaumont and turnouts have been provided to serve the Oak Valley Golf Course and the Morongo Tukwet Canyon Golf Course. The original master plan envisioned a pumping facility and extension up to Bogart Park, and to the Highland Springs Golf Course in Cherry Valley.

BCVWD Urban Water Management Planning

BCVWD is an urban retail water agency that is required to prepare and submit Urban Water Management Plans (UWMPs) every 5 years as required by the California Water Code. The District's 2002, 2005, 2013,2015 and 2020 had identified recycled water from the City of Beaumont as a significant portion of the District's water supply plan to meet projected demands.

Applications for SWRCB Funding

In November 2006, BCVWD submitted an application to the SWRCB for a State Revolving Fund (SRF) Loan program for $12.7 million low-interest loan and a $4.6 million grant from the Water Recycling Construction Program to complete the recycled water project. The project included a 2 MG storage reservoir, some pipeline segments, and a recycled water pump station at the City of Beaumont's treatment plant. The SRF loan application was revised in May 2007 at the request of the SWRCB and was modified to a $13.0 million loan and $4.0 million grant. As part of the application, BCVWD and the City of Beaumont were required to submit an analysis of the impacts of diverting portions of the City's Cooper's Creek discharge from Cooper's Creek to supply recycled water. On February 29, 2008, the U.S. Fish and Wildlife Service (USFW), after informal consultations with the City, BCVWD, and the SWRCB, issued a letter stating that 1.8 mgd of discharge from the City's treatment plant had to continue to be discharged to Cooper's Creek for habitat mitigation for federal listed species. The May 2007 SRF loan application was revised again in April 2008 to meet new SRF Loan requirements imposed by the State. The application was for a $11.2 million SRF Loan and $2.5 million grant. An Initial Study/Mitigated Negative Declaration, (State Clearing House SCH2007081127), was completed on August 24, 2008 which provided the environmental compliance for a recycled water distribution system which could be supplemented with imported SPW. The Facilities Plan was approved by the SWRCB on September 15, 2008. Shortly after the SWRCB Facilities Plan approval, and before a funding agreement could be produced, the SWRCB rescinded the funding agreement.

On June 25, 2009, BCVWD was awarded a $16.1 million, zero interest loan, under the American Recovery and Reinvestment Act of 2009, ARRA, (Federal Stimulus Funding), since BCVWD had "shovel-ready" recycled water projects, i.e., the projects in the Facilities Plan Approval of September 15, 2008. Design was complete on some of those projects and others were ready to start design since CEQA and federal environmental "cross-cutter" documents were completed. BCVWD bid and awarded four recycled water projects under this program (2 MG Non-potable 2800 Zone reservoir, Brookside Avenue pipeline, Desert Lawn Drive pipeline, and Three Rings to Oak Valley Parkway pipeline. Shortly after these projects were underway, the SWRCB, the agency administering the program, again rescinded the funding stating that BCVWD did not have firm letter of commitment from the City of Beaumont for recycled water. The projects were ultimately completed by BCVWD using their own funds and a conventional loan. The loan has since been completely repaid.

In 2010, BCVWD applied to the SWRCB and was awarded a Facilities Planning Grant for a recycled water connection to YVWD's non-potable water system, based on discussions

between YVWD and BCVWD. In August 2014, the SWRCB approved the Facilities Plan and BCVWD was eligible to apply for a State Revolving Fund (SRF) water recycling program grant/ low interest rate loan funding for the project. As part of the effort to prepare the Facilities Plan, significant effort was performed on updating the planning of BCVWD's non-potable water system which forms the basis for this Non-potable Water Master Plan. Further discussion of connection to YVWD's recycled water system is no longer considered.

In 2016, there was consideration for regionalization which would involve treating some or all of the City of Beaumont's wastewater at the YVWD's Wochholz Regional Water Reclamation Facility (WRWRF), with the recycled water pumped back to BCVWD for reuse. This option was evaluated by a consultant to the City of Beaumont and the City elected not to pursue the regional system. The City decided to upgrade and expand its existing wastewater treatment plant, construct a brine line to the Inland Empire Brine Line (IEBL) in San Bernardino, and install salt mitigation facilities in compliance with the Regional Board's NPDES Permit requirements and the Beaumont Management Zone Maximum Benefit Water Quality Objectives.[4]

BCVWD Board of Directors and the City of Beaumont City Council approved and executed a Memorandum of Understanding (MOU) for recycled water from the City's wastewater treatment plant in June 2019. This was the culmination of an effort that started in September 2017 with a 2 x 2 Ad-hoc Committee of BCVWD Board and City Council members. The MOU set down general terms, roles and responsibilities of both entities as they relate to the delivery of recycled water from the City to BCVWD. A formal contract remains to be developed and negotiated based on the principles in the MOU. The MOU is in force until 18 months from execution or full completion and acceptance by the City of the treatment plant and brine line construction projects.

Other Related Studies

Related studies prepared by the District and others in the area over the last ten years or so which provide background for this non-potable water master plan update are identified below:

- In June 2004, BCVWD contracted with Black and Veatch to prepare an update to the facilities fees (impact fees) paid by developers to upgrade the District's infrastructure. This study included impact fees for the recycled water system. That study was subsequently updated by Raftelis Financial Consultants, Inc. in June 2007, including the recycled water system. These recycled water facilities fees (from 2007) are the same as currently stated in the District's Rules and Regulations for Water Service.
- In 2007, in cooperation with BCVWD, the U.S. Bureau of Reclamation completed a desktop study of the feasibility of developing a constructed wetlands to remove nitrate from groundwater and recycled water. If the concept proved feasible, a demonstration

[4] City of Beaumont (2016). Feasibility Study for WWTP Expansion & Salt Mitigation, prepared by Albert A. Webb and Associates and Aqua Engineering, December.

scale facility would be constructed at the mouth of Edgar Canyon. Due to the low removal rates for nitrates in this type of system, the land area requirements were substantial; the project was deemed "not feasible" and work ceased.

- Water Quality Impacts from Onsite Waste Disposal Systems in the Cherry Valley Community of Interest, (March 2007), was prepared by Wildermuth Environmental, Inc. for San Timoteo Watershed Management Authority (STWMA) Project Committee No. 1. This study concluded there was an impact from on-site wastewater disposal systems on water quality in the Beaumont Basin. Riverside County Board of Supervisors created a "Blue Ribbon" committee to review the findings of the report in response to challenges from some members of the public. In June 2009, the committee issued a report which concluded there was no immediate concern. The study did recommend an independent third party take another look, with better sampling techniques, an expanded sampling program, and with more wells included. In February 2012, University of California Riverside (UCR), under a grant from the SWRCB, performed this third party investigation using chemical and isotope tracers. The study concluded that, within the District's service area, there is a statistically significant difference in the characteristics of the groundwater beneath areas with septic systems and groundwater beneath areas where sewer service is available. Pharmaceuticals and Personal Care Products (PPCPs) were found to be statistically significantly higher in areas with septic systems than in areas with sewer service. Total Dissolved Solids (TDS) concentrations were similarly higher in the groundwater underlying areas with septic tanks vs. those areas with sewer systems.[5]
- Preliminary Assessment of Assimilation Capacity for TDS and Nitrogen in the San Timoteo Management Zone November 2010 by Wildermuth Environmental, Inc. projected changes in TDS and nitrogen concentrations in the groundwater over time using a simplified complete mix model.
- A study on the effects of Blending Various Source Waters in BCVWD's Non-potable Water System – TDS Implications, May 2012 was prepared by BCVWD to determine how much City of Beaumont and recycled water from other sources could be beneficially used and still be in compliance with the RWQCB's Maximum Benefit TDS limit of 330 mg/L annual average.
- On July 25, 2015, the RWQCB adopted NPDES Permit CA0195376, Order No. R8-2015-0026 which established TDS, ammonia, and total inorganic nitrogen (TIN) limits for discharge to Cooper's Creek and for reclamation beneficial uses. A time scale for compliance was included. Of significance is the TDS for recycled water was set at 330

[5] University of California, Riverside (UCR 2012). Final Report: Water Quality Assessment of the Beaumont Management Zone: Identifying Sources of Groundwater Contamination Using Chemical Isotopic Tracers, SWRCB Agreement No. R8-2010-0022, Department of Environmental Science, February 3.

mg/L (12-month flow weighted average) in the recycled water leaving the treatment plant. Blending with lower TDS imported water or captured stormwater in the recycled water distribution system, as had been permitted in previous RWQCB Orders for the City's treatment plant, was no longer permitted. Order No. R8-2015-0026 required compliance by March 1, 2020. Construction was required to start by September 15, 2018. (The City Council awarded construction contracts for the wastewater treatment plant and brine line on October 2, 2018.)

- On June 7, 2016, the City of Beaumont City Council awarded a contract for a Feasibility Study for Salt Mitigation and Wastewater Treatment to Albert A. Webb & Associates to a) evaluate the expansion of the City's existing wastewater treatment plant along with upgrades to include desalting and brine disposal or b) evaluate the feasibility of conveying all of the City of Beaumont's wastewater to Yucaipa Valley Water District (YVWD) for treatment and disposal. Webb & Associates presented their analysis of the two options and on November 7, 2016, the City of Beaumont City Council, chose to expand and upgrade their own wastewater treatment plant. In December 2016, Webb and Associates completed the Feasibility Study for WWTP Expansion and Salt Mitigation. Plant capacity was recommended to be established at 6.0 mgd, with a 12-in diameter, 22-mile long, brine line extending to the end of the Inland Empire Brine Line (IEBL) in the vicinity of I-215 and I-10. A membrane bioreactor (MBR) process was selected for secondary/tertiary treatment with desalting using reverse osmosis. The project had an estimated initial capital cost of about $95 million, split almost equally between brine line and wastewater treatment.

  Webb & Associates completed the design of the brine line and MBR process and the project was put out to bid in three contracts – Brine Line Reach 1, Brine Line Reach 2, and the Wastewater Treatment Plant. Bids were opened in late June 2018 through early August 2018. The City Council awarded construction contracts for the wastewater treatment plant and brine line on October 2, 2018. Construction began in November/December 2018 and was projected to finish by mid-2020, but due to wet weather and COVID-19, completion has been delayed.

- In March 2017, BCVWD prepared a Recycled Water Salinity Management Plan that incorporated a month-by-month blending analysis for the years 2020 to Build-out to demonstrate that recycled water from the City of Beaumont could be blended effectively with imported SPW and non-potable groundwater to meet the RWQCB's discharge order R8 2015-0026 average annual TDS limit of 330 mg/L in the recycled water distribution system. The Salinity Management Plan indicated that it could be possible to defer construction of expensive desalting facilities at the City's wastewater treatment plant. Meetings were held in late 2017-early 2018 with the City, BCVWD and the RWQCB to see if it were possible to modify the permit to permit blending with lower TDS water in the recycled water distribution system to meet the 330 mg/L TDS requirement. The Basin Plan Amendments, (Resolution R8-2014-0005), permit blending with imported

water and new captured stormwater to achieve a 10-year, running annual average TDS of 330 mg/L. This salinity plan was presented to the RWQCB, but the current Order has not changed. The City of Beaumont opted to construct and implement the desalting and brine facilities as required by the Order.

Significant Events and Actions Since the Last Draft Master Plan

Significant relevant events which have occurred since the last draft master plan include:

- In January 2001, the San Timoteo Watershed Management Authority (STWMA) was formed as a Joint Exercise of Powers Agency (JPA) comprised of BCVWD, the City of Beaumont, YVWD, and South Mesa Water Company to prepare and implement a water resources management program to enhance the region's water resources, maximize the utilization of local supplies, improve surface and groundwater quality and quantity, protect and enhance groundwater storage, agriculture, and recreational resources, preserve open space, protect wildlife habitat and wetlands, all for the benefit of the public. STWMA conducted a number of studies, some of which were grant funded; but most importantly, they were the plaintiff in the Beaumont Groundwater Basin Adjudication. STWMA ceased to function as a JPA around 2010.
- The Beaumont Groundwater Basin was adjudicated in February 2004, in Superior Court, Riverside County, Case RIC 389197, *San Timoteo Watershed Management Authority vs. City of Banning et. al.* The Judgment established the Beaumont Basin Watermaster (Watermaster) to administer the judgment and established the rights of the overlying and appropriator parties. The powers and duties of Watermaster are delineated in the Judgment and include, among others: wellhead protection and recharge, well location, well abandonment procedures, well construction standards, overdraft mitigation, replenishment, monitoring of water levels and water quality, and development of conjunctive use programs.
- Phase I of the East Branch Extension of the California Aqueduct (EBX or EBX I) was completed by the California Department of Water Resources (DWR) in 2003 which brought State Project Water into the San Gorgonio Pass Area. BCVWD started recharging imported water at its recharge site (Phase I) in September 2006. Phase II of the Recharge Site was completed in 2018.
- In 2007, BCVWD completed a facilities plan to install sewers to serve the Cherry Valley Community of Interest to mitigate potential nitrate contamination of Beaumont Basin groundwater from on-site wastewater disposal systems in the area. Nitrate spikes were observed in two of BCVWD's wells several years earlier. These "spikes" have not reappeared. The Community of Interest included 1,638 single family homes and 426 mobile home units. The wastewater would have been treated in the City of Beaumont's

system under agreement between the City and BCVWD or in a separate BCVWD owned and operated treatment facility. The project never went beyond the planning stage.

- In 2007, BCVWD filed an application with Riverside County LAFCO to activate the District's latent sewering authority. LAFCO required a vote of BCVWD residents and on September 25, 2007, the voters defeated Measure B. As a result, BCVWD does not currently have sewering authority and cannot provide sewer service at this time without LAFCO approval. The LAFCO application was in conjunction with a proposal to provide wastewater collection and treatment for the Cherry Valley Community of Interest described above.
- Regional Board Order R8-2015-0026, NPDES CA0105376, Waste Discharge Requirements and Master Reclamation Permit for the City Beaumont's Treatment Plant was issued on July 24, 2015. The Order identified three locations for water reuse: Tukwet Canyon Golf Course, Oak Valley Golf Course, and water delivered to BCVWD for reuse. This rescinded Order R8-2006-003 as amended by R8-2009-0002. The new Order imposed Maximum Benefit water quality objectives on the recycled water use (12-month, flow weighted running annual average of 330 mg/L TDS). Blending with lower TDS imported water or new captured stormwater to comply with the 330 mg/L TDS was no longer an option. This was discussed previously. Any discharge to Cooper's Creek over and above the flow required for habitat protection (1.8 mgd), the 12-month, flow weighted running annual average must not exceed 300 mg/L TDS.
- As discussed previously, the City of Beaumont has started construction on the expansion and upgrade of their wastewater treatment plant to meet the Basin Plan, Maximum Benefit Water Quality Objectives.

Significant Interagency Discussions

The District has entered into a number of significant interagency agreements with the City of Banning, City of Beaumont, YVWD and others that have an impact on non-potable water supply planning.

City of Beaumont

BCVWD and the City of Beaumont worked cooperatively to install potable and non-potable water facilities to serve approved City developments from the late 1990s to the present. These were funded extensively through Mello-Roos Community Facilities District (CFD) Bonds, developer facility fees and BCVWD.

BCVWD has been involved in discussions with the City over the last twenty or more years relating to distributing recycled water from the City's treatment plant. As stated above, an MOU outlining the principles of an agreement on the delivery of recycled water from the City's WWTP to BCVWD was executed by both BCVWD and the City in June 2019.

BCVWD staff and City staff continue to discuss facility requirements (equalization storage, pipelines, and pumping station), the location of the facilities, and the entity responsible for design and operation. In November 2019, BCVWD and the City agreed on a location for the recycled water pump station which would pump from the City's Wastewater Treatment Facility to BCVWD's 2800 Zone NP tank.

City of Banning

There were preliminary discussions of the City of Banning participating in a regional reclamation system involving YVWD, the City of Beaumont, Banning and BCVWD. The City of Banning began construction of a non-potable transmission line from the Sun Lakes Development eastward which would eventually extend to their wastewater treatment facility southeast of the City of Banning at some future time. The City of Banning planned to pump groundwater, extracted by wells surrounding their existing wastewater percolation ponds, to the Sun Lakes Golf Course to reduce potable water use. A significant portion of this pipeline has been installed.

BCVWD and the City of Banning have jointly funded several potable water wells and pipe extensions under Highland Springs Avenue which were constructed to allow Banning to receive potable water from BCVWD's system. There are also non-potable water pipelines in Oak Valley Parkway, Sundance Drive, Discovery Way, and Second Street that currently terminate at Highland Springs Ave. that could be extended across Highland Springs Avenue to supply recycled water to the City of Banning at some point in the future.

Yucaipa Valley Water District

In 2010 the District met with YVWD to discuss a recycled water interconnection and other water supply issues of mutual interest. Yucaipa agreed to amend their SRF loan to extend their recycled water pipeline to the District's service area boundary at Cherry Valley Blvd. and the District would continue the pipeline to connect to the District's existing recycled water system. BCVWD prepared a "Facilities Plan" for this project and was described above.

It was also discussed that the District could provide potable water supply, on an interim basis, to some of the portions of Yucaipa's service area which can be served more easily at the present time by BCVWD. On March 18, 2016, YVWD provided tentative estimates of recycled (non-potable) water which could be supplied to BCVWD.

YVWD submitted a "change petition" to the SWRCB Division of Water Rights to reduce YVWD's discharge to San Timoteo Creek. The Division of Water Rights granted the "change petition," but limited recycled water use to YVWD's service area[6]. This precluded use in the Beaumont

[6] Change Petition WW-26, Division of Water Rights, May 28, 1996, "place of use shall be within areas set forth in Yucaipa Valley Water District's Reclamation Master Plan November 1993," and is restricted to irrigation.

Basin by BCVWD. As a result, securing recycled water from YVWD is not considered in this Master Plan. It is possible that YVWD could reopen the petition at some future time, however unlikely.

Development of a Non-potable Water System

In the late 1980s, BCVWD considered development of a recycled water system in cooperation with the City of Beaumont, the owner-operator of the wastewater treatment plant. It was clear at the time that development and population growth would occur in the service area and water would be needed to support the anticipated growth. Groundwater was limited and imported water would be needed; the use of recycled water would reduce the quantity of imported water needed. Beginning in 1993, BCVWD and the City of Beaumont entered into a series of cooperative agreements to develop and finance a recycled water system recognizing that if growth were to occur in the area, maximization of local water resources was imperative. Community Facilities District (CFD) CFD 93-1 was formed by the City of Beaumont, in cooperation with a number of the landowners, to finance potable and recycled water facilities, and other infrastructure by Mello-Roos Bonds.

The initial recycled water system pipelines were installed in the Three Rings Ranch development around year 2000. Since then over 50 miles of transmission and mainline piping have been installed funded by CFD bonds, BCVWD funds, and the developers. The existing system has about 300 connections in the City of Beaumont; just over 1,900 acre-ft of non-potable water was delivered to customers in 2021. In addition to water supplied to landscape irrigation customers, a small amount is supplied through construction meters for construction (about 300 acre-ft). Up until September 2015, the recycled water system was supplied with potable water since recycled water was not available. In September 2015, BCVWD introduced non-potable water from Well No. 26 into the system[7]. Well 26 discharge piping was re-plumbed to connect to the 2800 Zone NP system.

The 2600 and 2400 NP Pressure Zones are located south of I-10. These zones are currently isolated from the 2800 non-potable water zone. A valve in BCVWD's 2800 Zone non-potable water system near the intersection of Desert Lawn Drive and Champions Drive, at the end of the bore under I-10, has been closed. This isolates the 2800 Pressure Zone from the lower pressure zones. BCVWD's potable water system, 2650 Zone Hannon Tank, provides water to the 2600 Non-potable Pressure Zone which currently operates at a 2650 hydraulic grade line (HGL) temporarily. The 2400 Non-potable Zone is served from the 2370 Potable Water

[7] In 2015 hexavalent chromium exceeding the state MCL was found in Well 26; rather than take the well out of service it was connected into the 2800 NP Pressure Zone and the 2800 NP Pressure Zone was isolated from the other non-potable pressure zones. The Superior Court of Sacramento County invalidated the MCL in May 2017 but Well 26 continues to supply the 2800 NP Pressure Zone. Water from Well 26 is no longer considered non-potable, but still supplements the non-potable system.

Pressure Zone through a reduced pressure backflow assembly at Palmer Drive and Singh Street. Once imported or recycled water is introduced into the non-potable water system, the system will be reconfigured and completely severed from the potable water system.

Filtered State Project Water (SPW) and non-potable groundwater are also proposed to be used in the recycled water system and, as a result, the system is more appropriately be called a Non-potable Water System. Current non-potable water customers include the City of Beaumont for street medians and community parks, Beaumont Unified School District for irrigation at the new schools, California Department of Transportation, Division 8, for freeway landscaping, and homeowners associations for common area landscape irrigation. At this time the non-potable water system does not extend into Cherry Valley or other unincorporated areas; but these areas benefit from the offset of imported water purchases by the use of non-potable water anywhere within the District's service area.

BCVWD Authority Under the Irrigation District Law

California Water Code §20500 *et seq*. defines the "powers" and authority of irrigation districts which are summarized below:

BCVWD Office since 2008

- Furnish water in the district for any beneficial use, including fire protection (§20500, 22077)
- Control, distribute, store, spread, treat, recapture and salvage any water (**including but not limited to sewage waters for the beneficial use of the district or its residents**) (§22078)
- Provide for any and all drainage made necessary by the irrigation provided for by the District. (§22095)
- Acquire lease and operate plants for the generation, transmission, distribution and sale of electric power (§22115)
- Acquire, construct, maintain, and operate facilities for the collection and disposal of sewage subject to approval by a majority of the voters of the district (§22170, 22176)
- Fix and collect charges for any service provided by the district including the sale of water (with standby charges), connections to new pipelines or extensions of existing pipelines, use of water for groundwater recharge, use of water for power purposes and sale of electric power (§22280)
- Impose a special tax pursuant to Article 3.5 (commencing with Section 50075) of Chapter 1 of Part 1 of Division 1 of Title 5 of the Government Code. The special taxes

shall be applied uniformly to all taxpayers or all real property within the district, except that unimproved property may be taxed at a lower rate than improved property (§22078.5)

Although these powers are permitted under statute, approval from the Local Agency Formation Commission (LAFCO) may be required before some of the activities listed above are undertaken. BCVWD has the authority to supply non-potable water.

The District is governed by a 5-member Board of Directors, each representing a division within the existing service area. Members of the Board of Directors are elected at-large.

Service Area

The District's present service area covers approximately 28 square miles, virtually all of which is in Riverside County, and includes the City of Beaumont and the community of Cherry Valley. The District owns 1,524 acres of watershed land in Edgar Canyon, a portion of which extends into San Bernardino County where the District operates a number of wells, percolation ponds, and several reservoirs.

The District's Sphere of Influence (SOI), or ultimate service planning area, encompasses an area of approximately 37.5 square miles (14.3 sq mi are in the City of Beaumont). This SOI was established by the Riverside and San Bernardino County LAFCOs. SOIs are established as a planning tool and help establish agency boundaries and avoid problems in service, unnecessary duplication of costs, and inefficiencies associated with overlapping service.

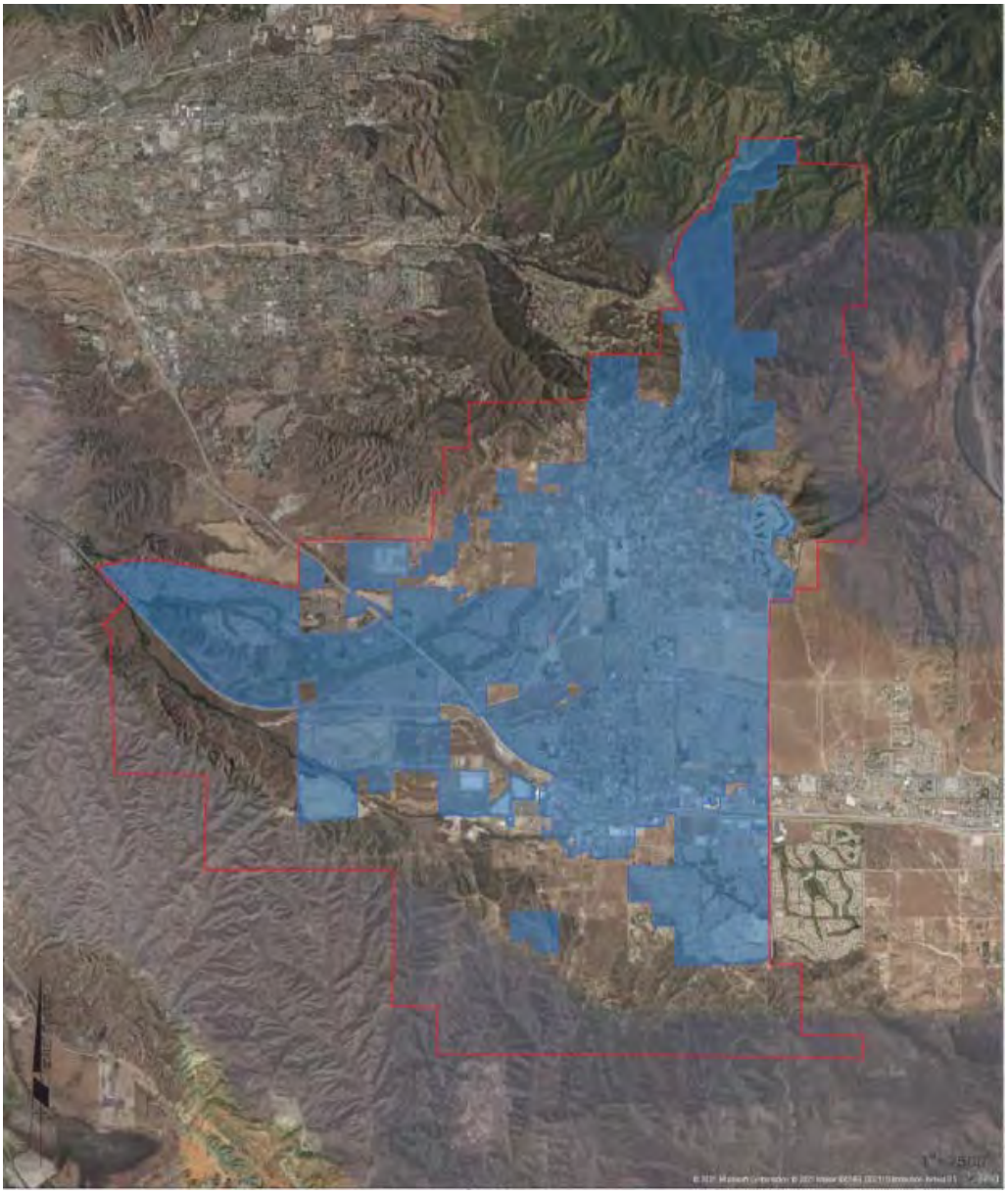
Figure 1-1 shows the District's present service boundary and SOI.

The District's SOI is bounded on the west and north by the Yucaipa Valley Water District (YVWD) and on the east by the City of Banning. The District’s SOI is bounded on the south by Eastern Municipal Water District. The northerly boundary of Eastern Municipal Water District (EMWD) is one-mile south of the District's southerly SOI boundary. The District’s SOI in Little San Gorgonio Canyon follows Oak Glen Road. The area west of Oak Glen Road is within YVWD’s SOI; east of Oak Glen Road is within the District’s SOI.

West of I-10, between Oak Valley Parkway (formerly San Timoteo Canyon Road) and I-10, the District’s SOI matches that of the City of Beaumont and extends northerly and westerly to Southern California Edison Power Line Easement (towers). This corresponds to the northerly boundary of the Fairway Canyon Project. North of the Power Line Easement there is an open space reserve that would limit any development westerly along Oak Valley Parkway (San Timoteo Canyon Rd). The area north of Cherry Valley Blvd from I-10 eastward to a point about 1,000 ft west of Hannon Rd is in the City of Calimesa and in YVWD’s SOI. A portion of the City of Calimesa is within BCVWD’s service area (approximately 360 acres north of Champions Dr., south of I-10).

Though not in the District's service area boundary at the present time, a future development, called the Beaumont Pointe (previously Jack Rabbit Trail) Project, southerly of Highway 60, is in the District's SOI and ultimately would likely be annexed and served by the District.

The District's service area ranges in elevation from 2,100 feet above mean sea level (MSL) in Fairway Canyon area of Beaumont on the western boundary of the service area, to 2,900 feet in Cherry Valley, and over 4,000 feet in the upper reaches of the SOI. The area serves primarily as a "bedroom" community for the Riverside/San Bernardino Area and the communities east of Los Angeles County along the I-10/CA-60 corridor.



Source: 2021 Microsoft Corporation 2021 Maxar CNES (2021) Distribution Airbus DS

NORTH

Not to Scale

Figure 1-1
District Boundary and Sphere of Influence

Beaumont Cherry Valley Water District
Beaumont, California

Climate

Table 1-1 presents the monthly temperature, precipitation, and evapotranspiration for the BCVWD service area.

Temperature

Table 1-1 presents temperature data for the City of Beaumont obtained from the Western Regional Climate Center. The climate in Cherry Valley is similar, but temperatures are cooler in the upper elevations of the District's SOI. Temperatures below freezing are common in winter in the upper elevations of the service area. Temperatures over 100°F are also common in the summer.

Precipitation

As shown in Table 1-1, virtually all the precipitation occurs during the months of November through April; most of the precipitation is in the form of rain, but snow is common in higher elevations of the service area during the winter. Some rainfall occurs in summer from thunderstorms that are associated with monsoonal moisture. Annual precipitation in Beaumont (2680 MSL) averages approximately 17.8 inches, with increasing amounts of precipitation with increasing elevation. Cherry Valley averaged 20.6 inches for the period 1911-2006; Oak Glen (4600 ft MSL) averaged 25.5 inches for the 61-year period 1946-2006.

Table 1-1
Climate in BCVWD Service Area[1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)[1]	60.3	63.1	65.8	71.9	78.6	87.5	95.6	95.5	90.5	80.1	69	61.7	76.6
Average Min. Temperature (F)[1]	38.4	38.8	39.9	42.7	47.5	52.2	58.2	58.8	55.5	49.1	42.9	39.2	46.9
Average Total Precipitation (in.)[1]	3.52	3.4	3.12	1.44	0.55	0.14	0.23	0.27	0.51	0.65	1.72	2.26	17.8
Average Total Snowfall (in.)[1]	1	0.4	0.2	0	0	0	0	0	0	0	0.1	0.2	1.8
Monthly Average Evapotranspiration, ETo (2021)[2]	2.28	2.72	4.33	5.43	6.6	7.41	7.96	7.7	6.11	4.27	2.73	1.92	59.46

[1] Western Regional Climate Center, Beaumont Station #2 8/1/1939 – 6/10/2016
[2] CIMIS website – Winchester, CA

Evapotranspiration

Table 1-1 presents the monthly reference average Evapotranspiration (ETo) based on the California Irrigation Management Information System (CIMIS), Winchester, CA station. This station is located about 20 miles south of the BCVWD and is representative of the evapotranspiration in the District's service area. The reference ETo represents the amount of water used and evaporated by a 4-in to 7-in tall stand of grass in an open field. Water use by other crops and landscape materials can be determined using the appropriate crop coefficient in conjunction with the ETo.

The service area is in Reference ETo Zone 9 – South Coast Marine to Desert Transition.[8] Outdoor water consumption for corrals, orchards, and lawns during the hot, dry summer months is high.

Hydrology

Surface Water

Little San Gorgonio Creek (locally also known as Edgar Canyon) and Noble Creek both originate in the San Bernardino Mountains and foothills and together represent the major surface water drainage system through the westerly BCVWD service area. Little San Gorgonio Creek joins Noble Creek at Cherry Valley Blvd. in Cherry Valley; Noble Creek then continues southwest to join San Timoteo Creek.

Marshall Creek drains the eastern portion of Cherry Valley and flows southwesterly joining San Timoteo Creek just upstream of San Timoteo Creek's confluence with Noble Creek. The main part of the City of Beaumont drains southerly to Cooper's Creek; Cooper's Creek is a tributary of San Timoteo Creek. San Timoteo Creek flows into the Santa Ana River near the City of San Bernardino, CA. The Santa Ana River then flows through San Bernardino County, through Prado Dam into Orange County, eventually reaching the Pacific Ocean near Huntington Beach, CA. The Santa Ana River watershed is the largest watershed in Southern California, draining over 2,650 sq mi.

The area generally east of Pennsylvania Avenue and west of Highland Springs Road in the City of Beaumont drains southerly into Potrero Creek, a tributary of the San Jacinto River, which eventually joins the Santa Ana River by way of Lake Elsinore. The Santa Ana/San Jacinto watersheds are in Regional Water Quality Control Board (RWQCB) Region 8 –Santa Ana River Region.

[8] California Department of Water Resources and University of California Cooperative Extension, A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California, The Landscape Coefficient Method and WUCOLS III, August 2000.

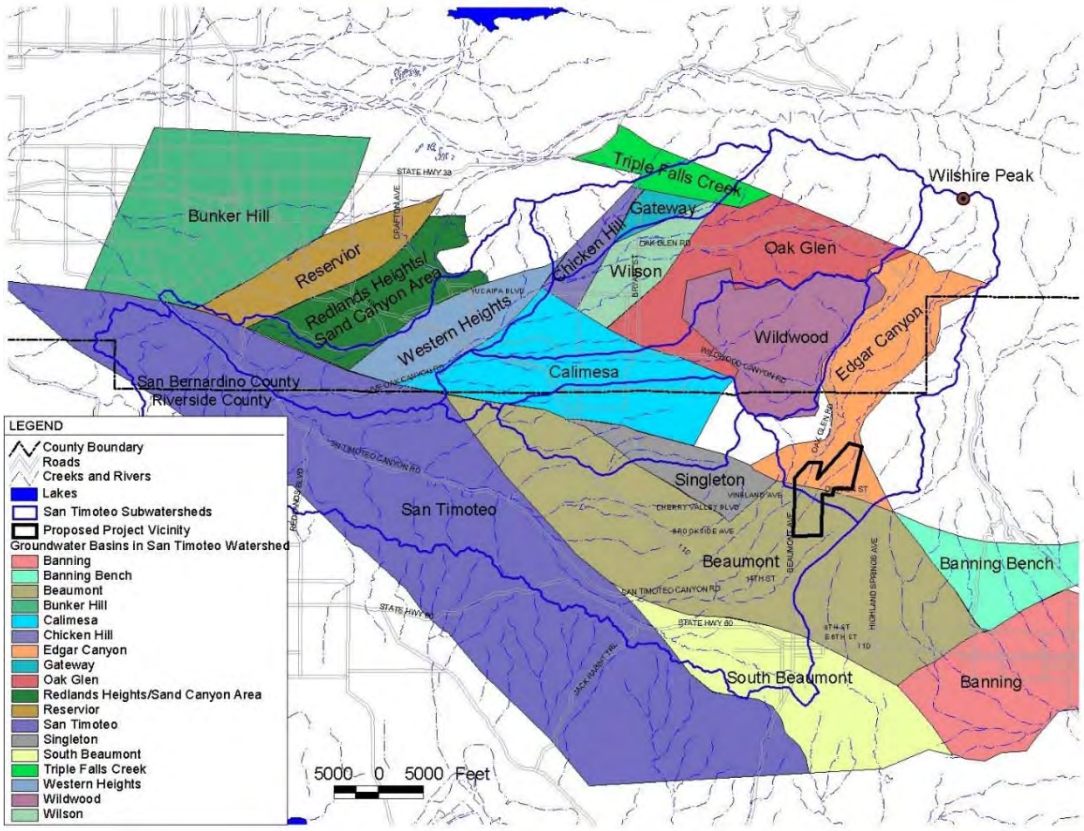
The area generally east of Highland Springs Road drains to Smith Creek, which flows east through the City of Banning, then into the Whitewater River and ultimately the Salton Sea. That area is actually in RWQCB Region 7 – Colorado River Region.

Except for those streams which receive wastewater effluent discharges, (San Timoteo Creek downstream of the YVWD outfall and Cooper's Creek downstream of the City of Beaumont's wastewater discharge), all of the streams in the area are intermittent and typically have water flowing only during and shortly after rainstorms. The USGS operated a stream gauging station in Little San Gorgonio Creek (USGS No. 11056500) at the old Oak Glen Road Bridge from 1948 through 1985. The tributary watershed area at the station was 1.74 sq mi. Analysis of the flow record at the gauge indicated that 88% of the daily flows were less than 1 cfs (2 acre-ft/day). The average flow during the gauged period was 0.7 cfs. During very wet years, the upper reaches of Edgar Canyon, (Little San Gorgonio Creek), have streamflow for extended periods of time.

The only other stream gage near the area is located along San Timoteo Creek near Loma Linda, some distance to the west.

Groundwater

Figure 1- 2 shows the groundwater basins within the Yucaipa-Beaumont-Banning area. Principal groundwater basins within BCVWD's service area are Edgar Canyon, Beaumont, Singleton, South Beaumont, and San Timoteo. Groundwater in the Singleton, South Beaumont and San Timoteo Basins is limited. Groundwater may occur in Noble Canyon, east of Edgar Canyon, though the District does not have any wells there to confirm it.



Source: Wildermuth Environmental, Inc.

Figure 1-2
Groundwater Basins in San Gorgonio Pass and Surroundings

Little San Gorgonio Creek (Edgar Canyon)

Groundwater in Edgar Canyon primarily occurs in the shallow younger and older alluvial valleys and within the rock fractures beneath the alluvium associated with the extensive faulting in the area. Numerous faults cross the canyon generally in a southeast-northwest direction. These act as barriers to groundwater movement and subdivide the canyon into a number of sub basins. The Edgar Canyon groundwater aquifer is limited, and storage is small. Groundwater levels vary from just few feet below ground surface (bgs) to about 200 feet bgs. The groundwater levels respond quickly to stream flow. During wet years considerably more water can be pumped than during dry years. BCVWD is the principal extractor in Edgar Canyon. Well yields are typically 200 to 500 gallons per minute, though some wells produce less. BCVWD's groundwater extractions from Edgar Canyon for the period 1983 – 2020 averaged 2,073 acre-ft/yr. The estimated safe yield from Edgar Canyon per a San Timoteo Watershed Management

Authority (STWMA) study is 2,600 acre-ft/yr.[9] A water budget analysis in a San Gorgonio Pass Water Agency Study suggested the yield to be in the range of 2,300 to 2,800 acre-ft/yr.[10] These studies are consistent with BCVWD's experience as to the amount of water available in Edgar Canyon.

Beaumont Basin (Beaumont Storage Unit)

The Beaumont Basin, or Beaumont Storage Unit (BSU) as it is also known, is one of the largest groundwater storage units in the San Gorgonio Pass area, covering an area of about 27 sq. mi. with at least 1.1 million acre-feet of water in storage and about 200,000 to 400,000 acre-feet of unused groundwater storage capacity. The San Timoteo Watershed Management Authority estimated the amount of water in the Beaumont Basin could be as much as 2.4 million acre-ft based on usable groundwater extending down to 1,500 ft below ground surface.[11] This is 500 ft deeper than previously assumed and is based on several recent wells drilled by BCVWD and others.

The boundaries of the BSU are defined on all sides by postulated faults including the Banning and Cherry Valley Faults to the north and unnamed faults to the south, east, and west. The Cherry Valley Fault is the dividing line between the BSU and the Singleton storage unit. See Figure 1-2 presented previously.

Groundwater within the BSU primarily occurs in the older alluvium and the San Timoteo Formation. Groundwater elevations in the BSU range from approximately 160 ft below ground surface (bgs) to 600 ft bgs. Underlying the BSU are nearly impermeable granitic/metamorphic basement rocks.

Groundwater flow in the BSU generally follows the ground surface topography. In the eastern portion of the BSU, most of the groundwater flows southeasterly from BCVWD's Noble Creek Recharge Facility to Smith Creek in Banning. Some groundwater flows from the Noble Creek Recharge Facility to the southwest; a small portion of that water flows into the San Timoteo Basin[12].

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[9] Wildermuth Environmental, Inc. (2005). Integrated Regional Water Management Program for the San Timoteo Watershed, Final Draft, prepared for the San Timoteo Watershed Management Authority, June 2005.

[10] SGPWA (2010). *Report on the Sustainability of the Beaumont Basin and Beaumont Management Zone*, prepared for the SGPWA by Hahn Water Resources, LLC, Evergreen, CO, November.

[11] "*Integrated Regional Water Management Program for the San Timoteo Watershed*," Final Draft, prepared for the San Timoteo Watershed Management Authority, Wildermuth Environmental, Inc., p 2-15, June 2005.

[12] Beaumont Basin Watermaster (2018). Draft Beaumont Basin Storage Loss Analysis, prepared by Thomas Harder & Co., in Association with Alda Inc., March 28.

Well depths in the Beaumont Basin extend down to 1,500 ft below ground surface and yields of 3,000 to 4,000 gpm are experienced.

The Beaumont Basin was adjudicated in February 2004, in Superior Court, Riverside County, Case RIC 389197, *San Timoteo Watershed Management Authority vs. City of Banning et al*. The Adjudication established the Beaumont Basin Watermaster (Watermaster) to administer the judgment. It established the rights of the Overlying Parties and the Appropriator Parties, e.g., BCVWD and others. Some of the essential elements of the Judgment are as follows:

- The Safe Yield of the Basin was originally established at 8,650 acre-ft/yr and was assigned entirely to the Overlying Parties. This was to be re-evaluated every 10 years. The Safe Yield was reevaluated to 6 700 AFY by Watermaster in April 2015.
- A controlled overdraft of the basin was allowed for the first 10 years after the court decision to create more usable storage capacity in the Basin for conjunctive use and to allow the San Gorgonio Pass Water Agency (SGPWA) to complete the imported water facilities. After 10 years (2014), the controlled overdraft ceased, and the appropriators, including BCVWD, Banning, YVWD, and others can only extract banked or stored water without paying an assessment to Watermaster. The assessment would be used by Watermaster to purchase imported water for basin replenishment.
- Any unused overlier pumping rights are redistributed, on an annual basis, to the appropriators according to pre-set percentages.
- If an appropriator, such as BCVWD, or YVWD, provides potable or recycled water to an overlying party, or an overlying party's land after development, the appropriator shall have the right to pump an equivalent volume of the overlying party's pumping right to offset the potable and recycled water provided.

These are the provisions that are of interest in this non-potable master plan; there are many other provisions which can be found in the Judgment itself.

For the period 2012 through 2020, BCVWD extracted an average of 10,585 AFY from the Beaumont Basin. From September 2006, the start of recharge, through end of 2021, BCVWD has recharged 111,360 AF of imported State Project Water (SPW) into the Beaumont Basin. BCVWD's account had 31,633 AF banked, in storage, in the Beaumont Basin at the end of 2021[13].

[13] Beaumont Basin Watermaster, (2022). 2021 Consolidated Annual Report and Engineering Report (Draft) prepared by ALDA, Inc. in association with Thomas Harder & Company, Engineering; Rogers, Anderson, Malody, and Scott, LLP. Financial Auditors; Alvarado Smith, Legal Counsel. April

Singleton Basin

The Singleton Groundwater Basin adjoins the Beaumont Basin and is separated from the Beaumont Basin by the Cherry Valley Fault as shown in Figure 1-2 presented previously.

Wells in the Singleton Basin are primarily for private use. BCVWD had a study performed in the 1980s on the potential yield of wells in the Singleton Basin[14]. Bloyd (1971) suggested that well yields in the Singleton Basin would be less than the other storage units[15]. Well yields are probably in the 200 gpm (300 AFY) range – perhaps slightly larger. BCVWD currently does not have any wells in the Singleton Basin. Not much is known about the natural recharge of the Singleton Basin, so long term production capacity is uncertain. Groundwater is reported to about 40-60 feet below ground surface, but could be deeper in some areas of the basin[16].

South Beaumont Basin

Groundwater in the South Beaumont Basin is limited to smaller private wells. The City of Beaumont explored developing a water supply from the South Beaumont Basin in the late 1980s, but test pumping of some of the City's wells resulted in impacts to some of the nearby private wells and the City did not pursue this source any further.

San Timoteo Basin

Previous hydrogeologic studies of the area indicated that groundwater was flowing from the Beaumont Basin into the San Timoteo Basin. A water loss study prepared by Watermaster indicated that some leakage from the Beaumont Basin to the San Timoteo Basin is occurring. During construction of the Fairway Canyon development and the City of Beaumont's brine line, shallow groundwater was observed in some of the excavations along San timoteo Canyon Road, near Palmer Avenue. It is believed this water is recoverable and can be used to supplement the non-potable water system.

Groundwater Water Quality

Edgar Canyon

The quality of the groundwater in Edgar Canyon is excellent. The TDS concentration is below 250 mg/L; hardness is moderate; nitrate levels are low, except at the mouth of Edgar Canyon.

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[14] Recollection of District Engineer J. C. Reichenberger PE of a report prepared for BCVWD by Robert Fox, circa 1985.

[15] Bloyd, R.M., (1971), Underground storage of imported water in the San Gorgonio Pass area, southern California: U.S. Geological Survey Water-Supply Paper 1999-D.

[16] USGS National Water Information System https://maps.waterdata.usgs.gov/mapper/index.html accessed 01/20/2022

At the mouth of Edgar Canyon, USGS has reported[17] that a monitoring well 2S/1W-22G4 had a nitrate-N concentration of 11.3 mg/L. This exceeds the drinking water maximum contaminant level (MCL) of 10 mg/L. (Well 2S/1W-22G4 is a shallow monitoring well that is perforated from 138 to 158 bgs.) USGS states that this well is likely affected by "an anthropogenic source of nitrogen that may include agricultural activity or septic tank seepage."

Data from 1998 and 1999, showed the TDS in BCVWD's RR-1 well, in the floor of Edgar Canyon near the mouth, was 370 mg/L. Nitrate as nitrate was 24-27 mg/L (5.4 – 6.1 mg/L as nitrate-N), which is less than the MCL. The TDS near the mouth of the canyon, where RR-1 is located, is much higher than farther up the canyon where BCVWD has its production wells. Well RR-1 has not been used for a number of years but is now in the process of being refurbished.

Bonita Vista Water Company wells on the ridge to the west of the mouth of Edgar Canyon, showed high nitrate concentration; the Company has since been annexed into BCVWD and is now served by BCVWD; the Bonita Vista wells have been taken out of service. According to the Beaumont Basin Watermaster, Cherry Valley Mutual Well, CVM-1, located west of the San Gorgonio Canyon spreading grounds, showed elevated nitrate levels also. Based on this information, the groundwater beneath the ridges adjacent to the mouth of Edgar Canyon likely has elevated nitrate concentrations. This groundwater could be extracted to supplement the non-potable water system and would assist in remediation of the groundwater in the area.

Beaumont Basin

Water quality in the Beaumont Basin is also excellent. In the Beaumont Basin during the period 2016-2020, the Beaumont Basin Watermaster reported TDS concentrations in the groundwater ranged from 170 to 350 mg/L based on data from 20 domestic wells[18]. The average was 240 mg/L. Historical ambient TDS based on the period 1954 – 1973 was 230 mg/L; for the period 1984 – 2003 the ambient TDS was 260 mg/L[19]. In comparison, Watermaster reported that the TDS concentration in 30 domestic wells in the Beaumont Basin averaged 245 mg/L for the period 2013 – 2017[20].

From this analysis, the TDS concentration in the Beaumont Basin has remained fairly stable.

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[17] USGS (2006). *Geology, Ground-Water Hydrology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside, California*, U.S. Department of the Interior, U.S. Geologic Report, in cooperation with the San Gorgonio Pass Water Agency, Scientific Investigations Report 2006-5026.

[18] Beaumont Basin Watermaster (2021). 2020 Annual Report, Draft, April

[19] Wildermuth Environmental Inc. (2007). First Biennial Engineer's Report, July 2003 through June 2006, Beaumont Basin Watermaster for San Timoteo Watershed Management Authority vs. City of Banning et.al, June.

[20] Beaumont Basin Watermaster (2018). 2017 Annual Report, March

Table 1-2 presents a summary of BCWD's groundwater supply quality which is a blend of Edgar Canyon well water and Beaumont Basin well water.

The water in Table 1-2 can be characterized as low mineral content but with moderate to high hardness.

Data from Watermaster for period 2016 – 2020 showed that maximum nitrate-N concentrations ranged from 0.89 mg/L to 7.00 mg/L with an average of 2.62 mg/L. Wells owned by overlying parties exhibited a slightly higher average, ranging from 0.26 to 6.20 mg/L, with an average of 3.23 mg/L. The basin-wide average nitrate-N, based on 32 wells and 260 samples, was 3.00 mg/L – well below the MCL of 10 mg/L.[22]

Average nitrate-N concentrations in the Beaumont Basin for the period 2002 – 2006 ranged from 0.26 to 7.9 mg/L, with maximum concentrations ranging from 0.26 to 9.03 mg/L. During that same period about 70% of the wells sampled for nitrate-N had an average concentration less than 2.5 mg/L. None of the wells sampled had nitrate-N exceeding the MCL of 10 mg/L[23]. BCVWD's Well No. 16 in Cherry Valley experienced a "spike" in nitrate-N in 2005 reaching 9.0 mg/L; at the same time, Well No. 21 showed a concentration of 6.1 mg/L.[24] These concentrations have since decreased. This was investigated; but no conclusions could be drawn as to the exact cause. It is possible this could occur again. For the period 2011-2015, Watermaster reported the nitrate-N concentration ranged from 1.04 to 8.65 mg/L with an average of 2.83 mg/L based on 30 domestic wells.

The University of California Riverside (UCR), under contract with the State Water Resource Control Board (SWRCB), conducted a water quality assessment of Beaumont Management Zone with the specific objective of looking at nitrate contamination from on-site wastewater disposal systems.[25]

[22] Beaumont Basin Watermaster, (2021). 2020 Annual Report, Draft, April .

[23] Beaumont Basin Watermaster, (2007). First Biennial Engineers Report, July 2003 through June 2006, prepared by Wildermuth Environmental, Inc., for San Timoteo Watershed Management Authority, June.

[24] Wildermuth Environmental, Inc. (2007). Water Quality Impacts from On-site Waste Disposal Systems in the Cherry Valley Community of Interest, Final Report, prepared for San Timoteo Watershed Management Authority, Project Committee No. 1, March.

[25] Univ. of California Riverside (2012). Final Report: Water Quality Assessment of the Beaumont Management Zone: Identifying Sources of Groundwater Contamination Using Chemical and Isotope Tracers. SWRCB Agreement No. R*-2010-0022, Department of Environmental Sciences, Riverside, CA 92521, Feb 3.

Table 1-2
Summary of BCVWD Groundwater Quality[26]
(mg/L unless noted otherwise)

Constituent	Concentration (mg/L unless noted otherwise)	Average Range of Detections (mg/L unless noted otherwise)	Maximum Contanimant Level (MCL)
Total Dissolved Solids (TDS)	248.9	180 - 350	1000
Specific Conductance, µS/cm	426	340 - 590	1600
pH, pH Units	8.0	7.4 - 8.3	None
Sodium	19.9	13 - 35	None
Calcium	46.4	33 - 64	None
Magnesium	15	7 - 20	None
Bicarbonate	175.1	130 - 210	None
Chloride	11.8	0 - 46	500
Sulfate	27	10 - 47	500
Nitrate (as Nitrogen)	3.1	.72 - 7.0	10
Fluoride	0.37	0.23 - 0.64	2.0
Total Chromium, ppb	4.5	0 - 16	50
Total hardness, mg/L as $CaCO_3$	179.7	120 - 240	None

Alkalinity and Hardness were calculated; PHG = public health goal; Secondary MCLs for TDS, Specific Conductance, Sulfate and Chloride

Forty (40) wells and eleven (11) surface water sites were sampled and analyzed in the UCR study. In the central part of the Beaumont Management Zone (BMZ), i.e., generally in Cherry Valley, several wells "showed clear signs of contamination by septic systems. The groundwater within the central part of Cherry Valley appeared to be more strongly affected by septic systems than groundwater on the periphery of Cherry Valley. Several wells had measurable concentrations of pharmaceuticals and personal care products (PPCPs) and major anions and cations [associated with wastewater], suggesting septic waste was entering the groundwater system.[27]"

BCVWD has been able to deal with the nitrate concentrations by blending with other lower nitrate source waters when it has become an issue. Riverside County Ordinance 871 requires any new septic tanks within the Cherry Valley Community of Interest be able to remove 50% of the nitrogen. Usually this requires an "add on" process to the conventional septic tank. At some point in time it may be necessary to either install well-head treatment for nitrate removal (ion exchange or reverse osmosis) if blending alone cannot mitigate the problem. However, this is

[26] BCVWD 2020 Consumer Confidence Report

[27] Ibid, pg. 27

expected to be decades away. If the problem gets worse, sewers may need to be installed in the more densely developed portions of Cherry Valley.

One issue that has emerged is hexavalent chromium (Cr+6). Total chromium is regulated by the State of California Division of Drinking Water (DDW) at an MCL of 50 µg/L (50 parts per billion [ppb]). There are two forms of chromium that exist in natural waters – trivalent chromium (Cr+3) and hexavalent chromium (Cr+6). Trivalent chromium is a trace metal that the human body needs; hexavalent chromium is considered toxic based on laboratory animal studies. Trace amounts of hexavalent chromium are natural and found in rock and minerals. In some areas, high concentrations of hexavalent chromium are the result of industrial discharges. On July 1, 2014, a separate, State of California, MCL of 10 µg/L (10 ppb) for Cr+6 was established. On May 31, 2017, the Superior Court of Sacramento County determined that the established MCL for CR+6 was invalid, due to the fact that there was not proper consideration for the economic feasibility of necessary treatments with the MCL. In February 2020, the SWRCB published the White Paper Discussion on Economic Feasibility Analysis in Consideration of a Hexavalent Chromium MCL, which discusses various cost-benefit analyses of different treatment types versus potential exposure. The white pape concluded that a continued effort would need to occur to re-assess the MCL for CR+6. The SWRCB held a series of public workshops in December 2020 on treatment cost estimates. A public scoping meeting for the Adoption of a Regulation for the Hexavalent Chromium MCL was held by DWR on November 29, 2021. There is still yet to be any determination on an adopted MCL regulation for Cr+6 (as of January 2022).

At the present time, nitrates are not an immediate concern and there may be an MCL for CR+6, which may require installation of treatment at some time.

BCVWD sampled for hexavalent chromium as required by the State. Well 3, in the Beaumont Basin, had a concentration of 11 µg/L; wells 25 and 26, also in the Beaumont Basin, had concentrations of 11-12 µg/L and 14-15 µg/L respectively, all from natural causes. All were close to, but nevertheless, above the previous State MCL of 10 µg/L.

Well 26 is in close proximity of a 24-in non-potable water main and BCVWD decided to pipe Well 26 to the non-potable water system –until a decision was made to install treatment for Cr+6. With the state rescindment of the MCL of 10 ppb for Cr+6, groundwater from Well 26 is technically considered potable water. Well 26 is capable of pumping into either the non-potable or potable system. Since late August 2015, Well 26 has pumped into the non-potable water distribution system.

At the time of the MCL regulation of 10 ppb, Well Nos. 3 and 25 were placed on standby status and were not being used; it was anticipated that Well Nos. 3 and 25 needed to be modified to reduce the Cr+6. After the withdrawal of the MCL in 2017, Well Nos. 3 and 25 were returned to an active status and are currently pumping into the potable system.

Singleton Basin

In the Singleton Basin and Lower Edgar Canyon the maximum TDS concentration ranged from 236 to 400 mg/L with an overall average of 282 mg/L (17 wells, 36 samples). Maximum nitrate-N concentrations ranged from 0.60 to 14.0 mg/L with an overall average of 3.58 mg/L (17 wells 65 samples)[28] Groundwater at the mouth of Edgar Canyon shows relatively high nitrate concentrations as was discussed previously.

South Beaumont Basin

Based on the 2016 – 2020 sampling period, nitrate concentrations, as N, as reported by Watermaster ranged from 3.10 to 22.0 mg/L with an overall average of 9.64 mg/L (11 wells, 68 samples). The MCL is 10 mg/L. Maximum TDS in the South Beaumont Basin ranged from 236 mg/L to 400 mg/L, averaging about 482 mg/L based on sampling of 11 wells (64 samples). Most of the wells with the highest TDS concentrations in area occur in the South Beaumont Basin.[29]

San Timoteo Basin

The San Timoteo Basin within BCVWD's Sphere of Influence has received inflow from the City of Beaumont's wastewater treatment plant by way of Cooper's Creek for decades. Whatever effluent is not used by the habitat adjacent to Cooper's Creek percolates into the San Timoteo Basin and it is believed the TDS of the groundwater in this area is about 400 to 500 mg/L. A well drilled in the Olivewood Development for earthwork water supply, near the confluence with Cooper's Creek and San Timoteo Creek, yielded about 300 to 500 gpm, with TDS about 450 mg/L. BCVWD believes groundwater in San Timoteo Creek could be extracted to supplement the non-potable water system.

Imported Water and Recharge Facilities

Facilities

Imported State Project Water (SPW) plays an important role in the operation of non-potable water system. Untreated (raw) imported water can be filtered and subsequently used in the non-potable water system to supplement the other non-potable water supplies and, because of its relatively low TDS concentration, will facilitate meeting the Beaumont Basin maximum benefit water quality objectives established by the Regional Water Quality Control Board. (This is discussed in more detail in a subsequent section of this Master Plan. Raw water cannot be used per the City of Beaumont's current permit.)

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[28] Beaumont Basin Watermaster (2021). 2020 Annual Report, Draft, April

[29] Beaumont Basin Watermaster (2021). 2020 Annual Report, Draft, April

The San Gorgonio Pass Water Agency (SGPWA) imports SPW through the East Branch Extension (EBX) of the California Aqueduct. EBX Phase I was completed in 2003; Phase II (EBX II) was completed in 2018.

BCVWD takes water from a 24-in diameter turnout and metering station at the current end of the EBX I at Orchard Ave. and Noble Creek in Cherry Valley. The turnout was expanded to a total capacity of 34 cfs in 2019. Water from the turnout is metered by DWR and then enters a 3,500-ft long, 24-in diameter pipeline, constructed by BCVWD, which conveys the water to BCVWD's groundwater recharge site located east of Beaumont Ave. between Brookside Ave and Cherry Valley Blvd.

The 24-in diameter pipeline, designed for 34 cfs, was constructed in 2006. If operated continuously at that rate, the pipeline could convey 21,700 acre-ft per year. The capacity is based on maintaining a maximum pipeline velocity of about 10 ft/second.

The District constructed groundwater recharge facility on an 80-acre site on the east side of Beaumont Avenue between Brookside Ave. and Cherry Valley Blvd for the purpose of recharging imported SPW. The recharge project was the result extensive hydrogeologic studies and pilot testing the recharge a multi-year period. Phase 1 of the recharge facility, on the westerly half of the site, went on line in late summer 2006. Phase 2 of the recharge facility was completed in 2014. This site has excellent recharge capability. To date only imported water has been recharged at the site. Since its operation in 2006 through the end of 2021, 111,360 AF (36.28 billion gallons) of imported water have been recharged.

BCVWD is currently (2021) participating in a joint project with Riverside County Flood Control and Water Conservation District (RCFC&WCD) to construct the Beaumont MDP Line 16 Project, an 84" storm drain which will outlet into BCVWD's recharge facility for stormwater recharge. Construction is anticipated to begin in spring of 2021 and complete in early 2023.

The capacity of the recharge site is conservatively estimated at 25,000 to 30,000 AFY based on short term studies. With more aggressive maintenance, the capacity may be as much as 35,000 to 40,000 AFY.

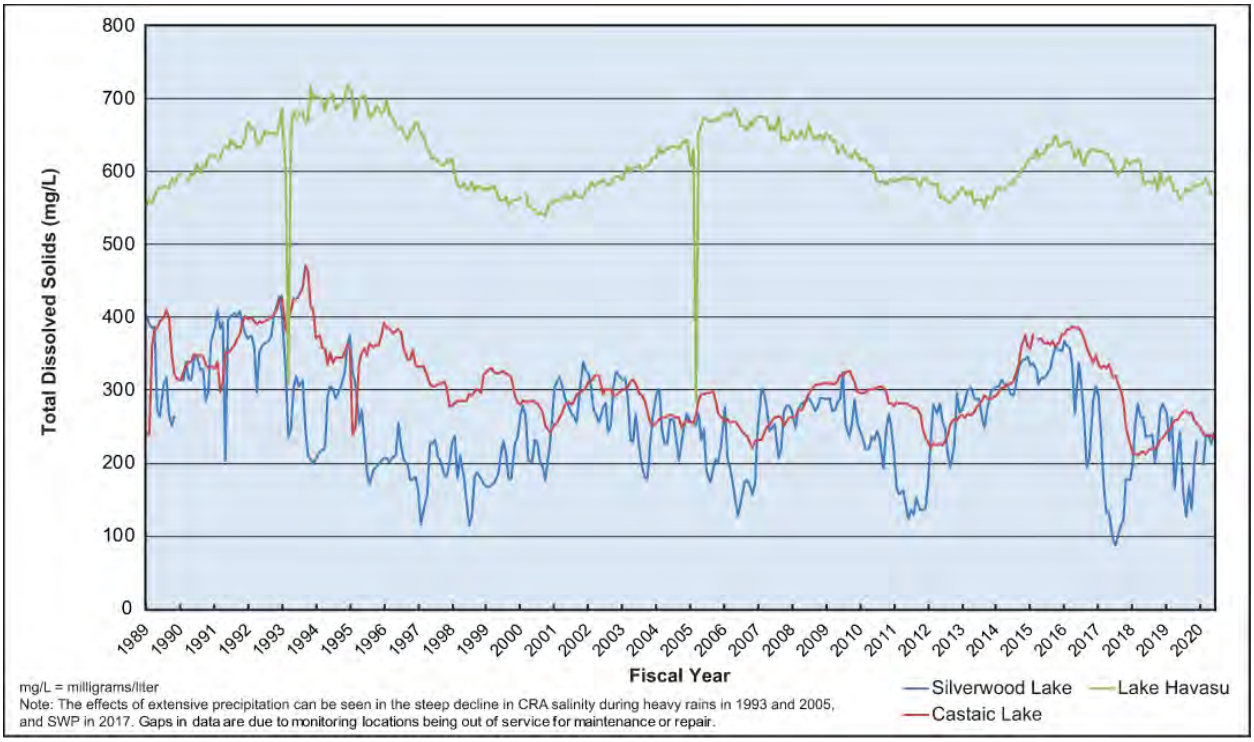
Imported water, stormwater, and recycled water, with appropriate treatment and permits, could be recharged into the Beaumont Groundwater Basin at the District's 80-acre site.

Imported Water Quality

State Project Water experiences some variations in water quality in response to wet and dry cycles in Northern California. Data from the Metropolitan Water District of Southern California (Metropolitan), shown in Figure 1-3, shows the TDS in their imported water supplies from 1988 to 2020 – a 32-year period. Of particular interest is the Silverwood Reservoir source. The SGPWA also uses this same Silverwood Reservoir source. During high flow years, the TDS dropped to about 100 mg/L; during the drought period of the early 1990s, TDS approached 400

mg/L. In the recent drought (2013-2016), the TDS has been in the 250 to 350 mg/L range. The nitrate concentration (as nitrate) in the imported water for 2018 was 0.37 mg/L as N.

Figure 1-3
Quality of Metropolitan's Imported Water Supplies[30]



Article 19 of the Department of Water Resources' contract with SGPWA states that it is the objective of the State and the State shall take all reasonable measures to make available project water of such quality that the TDS concentration does not exceed 440 mg/L on a monthly average or 220 mg/L as an average during any 10-year period.[31]

The average TDS for the period January 2009 through January 2018 was 265 mg/L[32]. Measurements of TDS and other constituents related to water quality were measured by DWR at the Devil Canyon Afterbay, which is the source of the EBX. This generally matches the TDS

[30] Metropolitan Water District of Southern California (Metropolitan 2020) Annual Report for the Fiscal Year July 1, 2019 to June 30, 2020. Chapter 4

[31] State of California Department of Water Resources (1962), Contract between the State of California, Department of Water Resources and San Gorgonio Pass Water Agency for a Water Supply. November 16.

[32] San Gorgonio Pass Water Agency Report on Water Conditions (2010, 2014, 2018

for the 25-year period from 1972-97[33]. For the 10-year period 1988-97 the TDS averaged 300 mg/L. This indicates that there could be some 10-year periods in the future where the SPW could exceed 250 mg/L and careful salinity management will be necessary. In their salinity management plan, Metropolitan used an average of 250 mg/L TDS for the East Branch.[34]

Implementation of the Bay Delta Conservation Plan and Delta Conveyance Project should help maintain or improve the quality of the SPW; so a TDS concentration of 250 mg/L as a 10-year average is reasonable at this time.

Non-potable (Recycled) Water System

BCVWD only provides potable and non-potable water service. BCVWD does not collect or treat wastewater. Within BCVWD's service area, only the City of Beaumont has sewers. (Although over 13,000 individual parcels are connected to the City's sewer system, the City reports there are about 148 parcels in the City that are on septic tanks[35].) Except for Highland Springs Village, which is served by the City of Beaumont, the unincorporated community of Cherry Valley has all on-site systems – septic tanks.

Currently BCVWD has over 50 miles of non-potable water pipelines in place ranging in size from 6-in to 24-in in diameter – all installed since 2002. The transmission system forms an almost complete loop around the City of Beaumont and comprises of primarily 24-in diameter ductile iron pipe. Figure 1-4 (11 x 17 foldout) shows BCVWD's existing and proposed non-potable water system.

The District's existing non-potable water service area ranges in elevation from 2150 ft to 2685 ft MSL which requires three pressure zones (2800, 2600, and 2400 Zones) to have reasonably manageable system pressures. The number designation, e.g., 2800, indicates the static hydraulic grade line (HGL) in the pressure zone, all relative to mean sea level.

In the future a fourth pressure zone (3000 Zone) may be added. This zone could serve non-potable water to Highland Springs Village Golf Course in Cherry Valley. The pressure zones and service elevations are shown in Table 1-3.

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[33] California Urban Water Agencies (1999). Recommended Salinity Targets and Program Actions for the CalFed Water Quality Program, December.

[34] Metropolitan Water District of Southern California (2012). Salinity in Metropolitan Supplies, Historical Perspective, Handout #2. Presented at Salinity Management Update Study Workshop, Southern California Salinity Coalition, June 1.

[35] City of Beaumont City Manager's Office (2015). Staff Report, Potential Grant for Conversion of Septic Tank Systems 6th Street/Maple Avenue, July 20.

Table 1-3
BCVWD Non-Potable Water Pressure Zones

NP Pressure Zone HGL	Service Elevations	
	Upper, ft MSL	Lower, ft MSL
3000	2885	2645
2800	2750	2500
2600	2500	2300
2400	2300	2100

The 2600 NP Pressure Zone was set up to match YVWD's HGL to facilitate direct service should this ever occur. The 2400 NP Pressure Zone is served from the 2600 NP Pressure Zone through pressure reducing valves. The 2600 NP Pressure Zone will be served by a new pressure regulating station from the 2800 NP Pressure Zone. Future regulating stations may be added. A 2600 NP Pressure Zone tank(s) is(are) proposed to be constructed, if warranted.

Figure 1-5 (11x17 foldout) shows the location of the pressure zones.

The non-potable water system includes a 2 million gallon (MG), 2800 Zone, non-potable water tank, which provides gravity storage and pressurization for the system to a static HGL of 2800 ft MSL. Most of the non-potable water demand system is at this HGL. The 2 MG tank is located at the District's groundwater recharge facility at Beaumont Avenue between Brookside Ave. and Cherry Valley Blvd.

Existing Non-potable Water Demands

Figure 1-6 shows the annual non-potable water used in BCVWD's system from 2006 through 2020 based on actual meter records.

Figure 1-4 Non-potable system plan (11x17) foldout

LEGEND

DISTRICT SPHERE OF INFLUENCE

PRESSURE ZONE BOUNDARY

EXIST.	FUTURE
36"	
30"	
24"	
20"	
18"	
16"	
14"	
12"	
10"	
8"	
6"	

DEVELOPMENT INDEX (2400 - 2600 PRESSURE ZONES)	
2400 PRESSURE ZONE	
29	FAIRWAY CANYON DEVELOPMENT
29Y	NICKLAUS PARK
42	BEAUMONT POINTE SITE
2600 PRESSURE ZONE	
1	TUKWET CANYON GOLF COURSE
2	TOURNAMENT HILLS
2A	PARK AT LINKSMAN
2B	STREET LANDSCAPING ALONG OVP (LOW WATER USING)
2C	PARKS 17 AND 18
6	OLIVEWOOD RESIDENTIAL DEVELOPMENT
29	FAIRWAY CANYON DEVELOPMENT
29A	PA-14 RESIDENTIAL
29B	PA-16, 18, 19, 25 RESIDENTIAL
29C	PA-17 PARK
29D	PROPOSED SCHOOL
29E	PA-18, 20A, 20B, 20C 22 RESIDENTIAL
29F	PA-21B PARK
29G	PA-26 RESIDENTIAL AND PARK
36	HIDDEN CANYON
108	MIXED USED - RESIDENTIAL/COMMERCIAL/INDUSTRIAL (FORMERLY LEGACY HIGHLANDS)
109	BEAUMONT VILLAGE

DEVELOPMENT INDEX (3000 PRESSURE ZONE)	
100	HIGHLAND SPRINGS GOLF COURSE

DEVELOPMENT INDEX (2800 PRESSURE ZONE)	
3	OAK VALLEY GREENS GOLF CLUB
9	NOBLE CREEK ESTATES
10	NOBLE CREEK MEADOWS
12	OAK VALLEY VILLAGE
13	XENIA APARTMENTS (FORMERLY BEAUMONT COMMONS)
14	KIRKWOOD RANCH
15	FUTURE MIXED-USED DEVELOPMENT
17	SUNDANCE RESIDENTIAL DEVELOPMENT
17A	PARKS
17B	STARLIGHT ELEMENTARY SCHOOL
18	WOLVERINE DISTRIBUTION CENTER
19	DOWLING ORCHARDS INDUSTRIAL PARK
20	ICON IFIT WAREHOUSE
23	K-HOVNANIAN FOUR SEASONS
24	BEAUMONT INDUSTRIAL PARK
31	PACIFIC SCENE ASPEN CREEK, TR-31426
32	JEROME TAUREK
38	MOUNTAIN VIEW ESTATES
39	PACIFIC SCENE, TR-32850
40	BEAUMONT SUMMIT STATION
45	SAN GORGONIO VILLAGE
46	SUNDANCE CORPORATE CENTER
48	LOMA LINDA MEDICAL
49	BEAUMONT GATEWAY PLAZA
101	SAN GORGONIO MIDDLE SCHOOL (1591 CHERRY)/ BEAUMONT ADULT SCHOOL
102	NOBLE CREEK PARK
103	BEAUMONT HIGH SCHOOL (W/ ONSITE BOOSTER)
104	MOUNTAIN VIEW CEMETERY
105	ANNA M. HAUSE ELEMENTARY SCHOOL
106	SUNDANCE ELEMENTARY SCHOOL AND PARK

PIPELINES
NP-ZZZZ-####

REGULATORS
NR-ZZZZ-####
ZZZZ = HIGHER ZONE

BOOSTERS
NB-ZZZZ-####
ZZZZ = LOWER ZONE

TANKS
NT-ZZZZ-####

WELLS
NW-ZZZZ-####

1500' 750' 0 1500' 3000' 4500'

SCALE: 1"=1500'

SCALE: 1"=1500' DATE:12/09/2021 DRAWN BY: EJW CHECKED BY:___ W.O.:_____

BEAUMONT-CHERRY VALLEY WATER DISTRICT

NON-POTABLE WATER SYSTEM

NON-POTABLE WATER SYSTEM MASTER PLAN
2400, 2600, 2800 & 3000 PRESSURE ZONES

FIGURE 1

1 OF 1

BCVWD_RECYCLED_MASTERPLAN_20191007.DWG

Figure 1-5 Non-potable system pressure zones (11x17) foldout

Figure 1-6
Non-potable Water Use 2006 - 2021

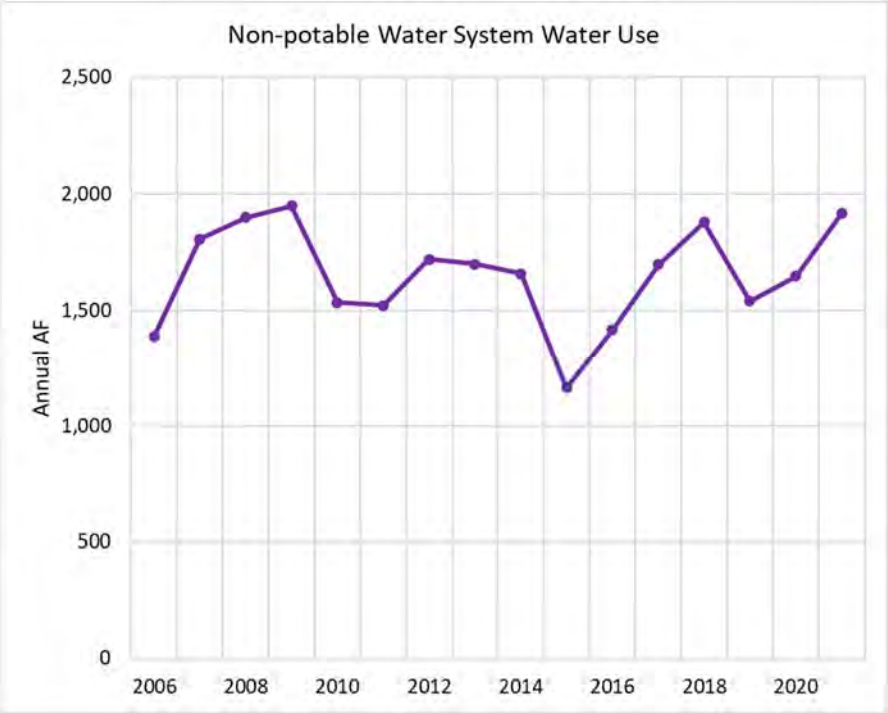


Table 1-4 shows the non-potable water use breakdown by pressure zone for 2020 and 2021.

Table 1-4
Year 2020-2021 Non-potable Water Use by Pressure Zone

Pressure Zone	Demand, AFY	Average Day, AF (mgd)	Average Day on Max. Month, AF (mgd)	Ratio of Ave Day on Max Month/Ave Day	Percentage of Demand in Pressure Zone
2020 Demand Data					
2800	1,249	3.42 (1.12)	7.03 (2.29)	2.06	75.8%
2600	354	0.97 (0.32)	2.04 (0.66)	2.10	21.5%
2400	44	0.12 (0.04)	0.29 (0.09)	2.38	2.7%
Total	1,647	4.51 (1.47)	9.36 (3.05)	2.07	100%
2021 Demand Data					
2800	1,436	3.93 (1.28)	7.88 (2.57)	2.00	74.9
2600	428	1.17 (0.38)	2.04 (0.66)	1.74	22.3
2400	54	0.15 (0.05)	0.30 (0.10)	2.07	2.8
Total	1,918	5.25 (1.71)	10.22 (3.33)	1.95	100%

Nearly 76% of the non-potable water is used in the 2800 NP Pressure Zone. The non-potable water demand in 2600 and 2400 NP Pressure Zones is currently small, but expected to increase (at least in the 2600 NP Pressure Zone) over time as the area between I-10 and the 60 Freeway develops.

Analysis of the approximately 311 non-potable water users in 2020 showed that the average water used per connection was 5.30 AFY; the median was 3.46 AFY per connection. About 28% of the users used 1.0 AFY or less of water. About 33% of users used more than 6.0 AFY; 18% used more than 10 AFY. The City of Beaumont used about 35% of BCVWD's non-potable water in 2020.

During the period 2007 through 2009 large amounts of landscaping for new housing was started which used significant water for landscape establishment. This dropped off when the landscaping became established and housing construction slowed down. The substantial drop in 2015 to 1,165 AFY was due to the drought and outdoor water use restrictions. Non-potable water use from 2010 through 2020 averaged 1,589 AFY (1.42 mgd).

New landscape requirements have been adopted by Riverside County and the City of Beaumont in response to state mandates to reduce outdoor water use. It is expected that these new standards will reduce outdoor water use over the long term.

In 2018 the California Legislature enacted two policy bills SB 606 and AB 1668 to establish a new basis for long-term water conservation and drought planning to adapt of climate change and to implement the concept of "Making Water Conservation a California Way of Life. "

The result of this legislation,:

- Irrigation of turf and ornamental (non-functional) landscaping landscape during and within 48 hours following measurable rain (defined as ¼ inch of rainfall) is prohibited. *This will reduce "water waste" and needless irrigation of turf and landscaping, including that irrigated by recycled and non-potable water.*
- As of January 1, 2025, irrigating of turf on public street medians and parkways is prohibited unless the turf serves a community recreational or civic function, the turf is irrigated incidentally with trees, or the turf is watered with recycled water by an irrigation system installed prior to 2018. *Significant street median areas within the City of Beaumont are currently irrigated with non-potable water from BCVWD's system. With the new legislation this will be significantly reduced or eliminated by January 1, 2025, reducing the demand for recycled water after that time. It is also likely, though not mandated, that street median landscaping currently irrigated with non-potable water will be changed over to drought tolerant landscaping over time, further reducing the demand for recycled or non-potable water.*
- Outdoor water use standard will be based on land cover, climate and other factors determined by SWRCB and the Department of Water Resources (DWR). Outdoor standard will be developed by June 2022. *This will affect the common areas and parks*

resulting in a gradual reduction in potable water demands (outdoor residential use) and recycled and non-potable water demands overall.

- The indoor water use standard will be 55 gallons per capita per day (gpcd) until January 2025; the standard will become stronger over time, decreasing to 50 gpcd by January 2030. This is to be determined over the entire service area population, not each household. The gpcd set by the State will include the commercial, industrial, or institutional (CII) component of water use. Performance standards for CII water use will be developed separately by the SWRCB. *The reduction in the indoor and CII water use will have some effect on the amount of wastewater generated and ultimately the amount of recycled water available for reuse. Also, the constituents in the wastewater will become more concentrated, resulting in increased concentrations of TDS and other constituents in the recycled water. This will have an impact on the City of Beaumont's reverse osmosis treatment system requiring more of the wastewater effluent to be treated with reverse osmosis resulting in increased waste brine flow and a reduction in the amount of recycled water available for reuse.*

The remaining sections of this Master Plan will discuss in further detail the anticipated non-potable demands of the District over the next 25 years, facility/infrastructure requirements, project costs, as well as anticipated non-potable supply.

Planned Near-term Capital Improvement Projects

As this master plan was being developed, BCVWD saw a need to immediately reduce the potable water demand to defer construction of additional, new potable water wells. Fine screens are planned to be installed to screen the imported SPW to remove fine debris which could increase landscape sprinkler maintenance. The screens are proposed to be installed adjacent to the 2800 Zone non-potable water reservoir. The use of SPW in the non-potable water system will reduce the need to pump groundwater into the 2800 Zone tank to meet non-potable water demands which will reduce costs.

Should the screens be installed prior to receiving recycled water from the City of Beaumont, the non-potable water system 2600 and 2400 NP Pressure Zones will be separated from the potable water system and reconnected with the 2800 Zone through pressure regulators. When that project is completed, the non-potable water system will have a blend of imported water and non-potable well water, supplemented in emergencies with potable water as needed. Recycled water will be introduced into the non-potable water system when recycled water is available. Before recycled water is used, cross-connection testing will need to be performed to comply with SWRCB DDW requirements.

Acknowledgements

This Master Plan was prepared by Mr. Joseph C. Reichenberger, P.E., BCEE, Senior Engineer; under the guidance of Dan Jaggers, P.E., General Manager, James Bean, Director of Operations; Knute Dahlstrom, Field Superintendent; Mark Swanson PE, Director of Engineering; Daniel Baguyo EIT, Engineering Assistant; Sylvia Molina, and other members of BCVWD's staff.

Section 2

Regulatory Constraints

BCVWD's non-potable water system could contain recycled water from the City of Beaumont in addition to non-potable groundwater, untreated SPW and potable groundwater to meet peak demands depending on the availability of the other sources. The non-potable water sources will be described in more detail in a subsequent section of this Master Plan.

There are both "statutes" (laws) and "regulations" (developed from the statutes by the regulating agencies) which govern the production and use of recycled water. They can be found at the SWRCB, DDW website: www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Lawbook.shtml.

State Statute sections involving recycled water can be found in the following California Codes:

- Fish and Game Code
- Government Code
- Health and Safety Code
- Public Utilities Code
- Streets and Highways Code
- Public Resources Code
- Water Code

The regulations covering recycled water are part of the California Code of Regulations (CCR). The regulations covering recycled water use include:

- CCR – Title 17, Division 1, Chapter 5, Group 4 Drinking Water Supplies (cross connections)
- CCR – Title 22, Division 4, Chapters 1 through 3

In addition the RWQCB Region 8 has requirements:

- RWQCB Region 8 Basin Plan and Adopted Amendments thereto
- Discharge Requirements (NPDES and Discharge Orders)

The RWQCBs and the SWRCB Division of Drinking Water (DDW) work cooperatively in developing waste discharge and recycled water use permits. The DDW is primarily responsible for compliance with Title 22 requirements and makes recommendations to the RWQCB for specific requirements to be included in the Discharge Requirements for the recycled water producer.

This section is intended to provide only a brief summary of the various regulations. Because regulations are subject to change, the reader should check with the SWRCB DDW for the latest regulations.

California Code of Regulations – Title 17

Title 17 Division 1, Chapter 5, Group 4 Drinking Water Supplies requires water suppliers to protect their public water supply from contamination by implementing a cross-connection control program which addresses the following as a minimum:

(a) Adoption of operating rules or ordinances to implement the cross-connection program.

(b) Conducting surveys to identify water user premises where cross-connections are likely to occur,

(c) Providing backflow protection by the water user at the user's connection or within the user's premises or both,

(d) Providing at least one person trained in cross-connection control to carry out the cross-connection program,

(e) Establishment of a procedure or system for testing backflow preventers, and

(f) Maintenance of records of locations, tests, and repairs of backflow preventers.

BCVWD has a cross-control program in effect. If the non-potable water system does not contain recycled water, the current cross-connection program would be sufficient. However, once recycled water is introduced, compliance with CCR Title 22 is required.

California Code of Regulations -- Title 22

California Code of Regulations Title 22, Division 4, Chapters 1 through 3, governs the uses of recycled water, use area requirements; treatment, effluent quality, and disinfection requirements; engineering design, reliability, engineering report requirements, and other requirements.

Recycled Water Treatment Requirements

The wastewater treatment and disinfection requirements depend on the recycled water uses. Title 22 has “standard” levels of treatment as defined in Table 2-1.

The City is nearing completion of the expansion expansion to 6 mgd flow capacity with upgraded treatment to include reverse osmosis treatment and brine disposal to meet Title 22 and TDS requirements. Construction is estimated to be complete around the end of 2022.

Table 2-1
Title 22 Recycled Water Treatment and Disinfection Requirements
(not including Indirect Potable Reuse or Surface Water Source Augmentation Projects)

Recycled Water Type	Treatment Requirements
Disinfected Secondary -- 23	Recycled water that has been oxidized (secondary treatment) and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.
Disinfected Secondary – 2.2	Recycled water that has been oxidized (secondary treatment) and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period
Disinfected Tertiary	A filtered and subsequently disinfected wastewater that meets the following criteria: (a) The filtered wastewater has been disinfected by either: (1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration. (b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

Recycled Water Uses

Table 2-2 presents a list of potential recycled water uses and the minimum level of treatment required. The City of Beaumont's recycled water (after required upgrades are constructed) will meet the treatment level requirements for any of the uses listed in Table 2-2.

Table 2-2
Minimum Treatment Requirements for Recycled Water Use

Recycled Water Use	Disinfected Secondary 23	Disinfected Secondary 2.2	Disinfected Tertiary
Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop			X
Parks and playgrounds			X
School yards			X
Residential landscaping			X
Unrestricted access golf courses			X
Recycled water used for the surface irrigation of food crops where the edible portion is produced above ground and not contacted by the recycled water		X	
Cemeteries	X		
Freeway landscaping	X		
Restricted access golf courses	X		
Ornamental nursery stock and sod farms where access by the general public is not restricted	X		
Pasture for animals producing milk for human consumption	X		
Any nonedible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground or school yard	X		
Non-restricted recreational impoundment			X
Restricted recreational impoundments and for any publicly accessible impoundments at fish hatcheries		X	
Landscape impoundments that do not utilize decorative fountains	X		
Industrial or commercial cooling or air conditioning that uses a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist			X
Industrial or commercial cooling or air conditioning that does not use a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist	X		
Flushing toilets and urinals, priming drain traps, industrial process water that may come into contact with workers, structural fire fighting, decorative fountains commercial laundries, consolidation of backfill around potable water pipelines; commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process,			X
Industrial boiler feed, nonstructural fire fighting, backfill consolidation around non-potable piping, soil compaction, mixing concrete, dust control on roads and streets; cleaning roads, sidewalks and outdoor work areas; industrial process water that will not come into contact with workers	X		
Flushing sanitary sewers	un-disinfected secondary		

Recycled Water Use Area Restrictions

The following are a summary of principal recycled water use area restrictions. The list is not comprehensive, but covers most of the more-frequently encountered situations.

- No irrigation with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well
- No impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.
- Any use of recycled water shall comply with the following:

  (1) Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

  (2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.

  (3) Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.
- No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.
- All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording: "RECYCLED WATER - DO NOT DRINK". Alternative signage and wording may be acceptable to DDW.
- Except as allowed under section 7604 of Title 17, CCR, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.
- Except for use in a cemetery that complies with the requirements of Section 8118 of the Health and Safety Code, the portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.

Dual Plumbed Recycled Water Systems

- A recycled water agency shall not deliver recycled water for any internal use to any individually-owned residential units including free-standing structures, multiplexes, or condominiums.[1]
- No recycled water agency shall deliver recycled water for internal use, except for fire suppression systems, to any facility that produces or processes food products or beverages. For purposes of this Subsection, cafeterias or snack bars in a facility whose primary function does not involve the production or processing of foods or beverages are not considered facilities that produce or process foods or beverages.
- No recycled water agency shall deliver recycled water to a facility using a dual plumbed system unless the required report has been submitted to, and approved by, the regulatory agency. The report shall contain the following:

  (1) The number, location, and type of facilities within the use area proposing to use dual plumbed systems,

  (2) The average number of persons estimated to be served by each facility on a daily basis,

  (3) The specific boundaries of the proposed use area including a map showing the location of each facility to be served,

  (4) The person or persons responsible for operation of the dual plumbed system at each facility, and

  (5) The specific use to be made of the recycled water at each facility.

  (6) Plans and specifications describing the proposed piping system to be used, pipe locations of both the recycled and potable systems, type and location of the outlets and plumbing fixtures that will be accessible to the public, and the methods and devices to be used to prevent backflow of recycled water into the public water system.

  (7) The methods to be used by the recycled water agency to assure that the installation and operation of the dual plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. This shall include a description of pressure, dye or other test methods to be used to test the system every four years.

  (8) A master plan report that covers more than one facility or use site may be submitted provided the report includes the information required by this section. Plans and specifications for individual facilities covered by the report may be submitted at any time prior to the delivery of recycled water to the facility.

[1] AB 1406, Chapter 537, Statutes of 2007, Water Code 13553, et seq., allows condominiums to be plumbed with recycled water, subject to a number of provisions.

Cross Connection Testing

Shutdown tests are to be completed prior to connection to any recycled water system, when changes are made to the site's potable and/or recycled water plumbing, and once every four years on all dual plumbed facilities. The purpose of the test is to ensure the systems are not cross-connected. The test can be done by a certified Cross-Connection Control Specialist. The test requires depressurization of the water and recycled water systems for as long as 1 – 3 hours per system.

Title 22 Engineering Report

A Title 22 Engineering Report is required to be submitted covering the treatment facilities and use areas. The City of Beaumont has completed its Title 22 Engineering Reports regarding treatment facilities. BCVWD will be required to provide the report on the use areas. The specific requirements of the Engineering Report are presented in "*Guidelines for the Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water*", Department of Health Services, Public Health, Division of Drinking Water and Environmental Management, Drinking Water Program, Recycled Water Unit, March 2001, now the Division of Drinking Water in the SWRCB. In addition to details of the use areas, the report will include descriptions of the use area monitoring and inspection and site employee training requirements.

Indirect Potable Reuse (IPR)

At the present time (2021) only indirect potable reuse of recycled water is permitted by the SWRCB DDW. Approved methods for IPR include:

- Groundwater Replenishment by Surface Application (Spreading)
- Groundwater Replenishment by Subsurface Application (Injection)
- Surface Water Augmentation (Addition of recycled water to a surface water reservoir used as a source of supply for a potable water treatment plant)

For BCVWD and the City of Beaumont, only groundwater replenishment by surface application would be the most likely method; though subsurface injection may be viable in some of the groundwater basins surrounding the Beaumont Basin.

Indirect Potable Reuse (IPR) Groundwater Replenishment – Surface and Subsurface Application

IPR Groundwater Replenishment using surface application (surface spreading at BCVWD's groundwater recharge facility) have special requirements involving source wastewater quality, level of treatment, dilution requirements, residence time in the aquifer, and monitoring and reporting requirements. There are specific controls on nitrogen, regulated contaminants, Total Organic Carbon (TOC), priority pollutants, etc. There are limits on the amount of recycled water that can be recharged in relationship to other recharge water of non-wastewater origin called the "Recycled Municipal Wastewater Contribution (RWC)." IPR projects will require advanced treatment.

The requirements for IPR projects are delineated in Article 5.1 of CCR Title 22 §60320.100 through §60320.130 and are too numerous to list herein. The reader should consult the SWRCB DDW for the latest requirements.
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Lawbook.html

BCVWD and the City anticipate more wastewater (potential recycled water), will be generated due to population growth. The amount will exceed the landscaping watering demands during the winter and early spring months. To maximize the use of local water resources, BCVWD should consider IPR by surface spreading in the future and this should be considered in this non-potable master plan as a longer range project.

Current Operating IPR Facilities

Agencies which have implemented large scale, indirect potable reuse, groundwater replenishment projects include Orange County Water District (OCWD), West Basin Municipal Water District, Central Basin and Upper San Gabriel Municipal Water Districts among others. The City of Los Angeles and the City of San Diego are in the planning stages. The Metropolitan Water District of Southern California and the Los Angeles County Sanitation Districts constructed a joint 0.5 mgd demonstration facility which is in operation. These existing and planned facilities typically provide advanced treatment consisting of microfiltration or ultrafiltration (MF or UF) of secondary effluent followed by reverse osmosis to remove dissolved minerals and trace contaminants, advanced oxidation/disinfection using high dose ultraviolet irradiation disinfection aided by hydrogen peroxide, with final product water stabilization for corrosion control. This process has been approved by the DDW and has operated successfully for more than a decade at OCWD and West Basin Municipal Water District. The OCWD facility now produces 100 mgd of advance treated recycled water for surface spreading and injection. Rough costs for such an advanced treatment facility are about $6/gal/day capacity and about $1,100/acre-ft for operating costs.

Regional Board Constraints

Beneficial Uses and Water Quality Objectives

The beneficial uses of the ground and surface waters along with the water quality objectives are presented in the Water Quality Control Plan (“Basin Plan”) for the Santa Ana River Basin (Region 8). The Basin Plan has been updated and revised by Santa Ana River Basin Water Quality Control Board Resolutions, the most recent being in 2019.

Beneficial Uses

Table 2-3 lists the “standard” beneficial uses; the designated beneficial uses of the surface and groundwater in the area are presented in Table 2-4. Figure 2-1 shows the boundary of the Beaumont Groundwater Management Zone.

Table 2-3
Standard RWQCB Beneficial Use Definitions

MUN	Municipal and domestic supply	REC2	Non-contact recreation
AGR	Agricultural supply	WARM	Warm freshwater habitat
IND	Industrial service supply	COLD	Cold freshwater habitat
PROC	Industrial process supply	WILD	Wildlife habitat
GWR	Groundwater recharge	RARE	Rare, threatened or endangered species
REC1	Contact recreation		

Table 2-4
Beneficial Uses of Receiving Waters within the Study Area

Receiving Water	Present or Potential Beneficial Uses
Surface Waters	
San Timoteo Creek Reach 3 – Confluence with Yucaipa Creek to confluence with Little San Gorgonio Creek and Noble Creek (Headwaters of San Timoteo Creek)	GWR, REC1, REC2, WARM, WILD, RARE. Excepted from MUN.
Little San Gorgonio Creek	MUN, GWR, REC1, REC2, COLD, WILD
Groundwater Management Zones	
Beaumont	MUN, AGR, IND, PROC
San Timoteo	MUN, AGR, IND, PROC
Yucaipa	MUN, AGR, IND, PROC

Water Quality Objectives

Tables 2-5 and 2-6 present the water quality objectives for surface and groundwater in the area. The RWQCB has established two water quality objectives for the Beaumont Management Zone:

- **Antidegradation Objectives** which are intended to maintain the ambient water quality in accordance with SWRCB Non-degradation Policy (Resolution 68-16).
- **Maximum Benefit Objectives** which allow some degradation of existing water quality but not to the extent that the beneficial uses are impacted and implementation of these objectives is for the maximum benefit of the people of the state of California.

The “maximum benefit” objectives allow the use of recycled water. Recycled water suppliers have agreed to meet specific requirements and make specific commitments to ensure the water quality in the groundwater management zones will not exceed the objectives.

Maximum benefit commitments for the Beaumont Groundwater Management Zone were made by YVWD, City of Beaumont, City of Banning, BCVWD, and SGPWA to implement a specific water and wastewater management program identified in the Regional Strategy. These commitments and the current status are shown in Table 2-6. The Regional Strategy includes enhanced recharge of native and recycled water, maximizing the direct use of recycled water, optimizing the direct use of imported water, recharge, and conjunctive use.

The Basin Plan was revised in 2019 through Resolution R8-2019-0055 to include the updated Maximum Benefit Commitments after dissolution of STWMA and other items.

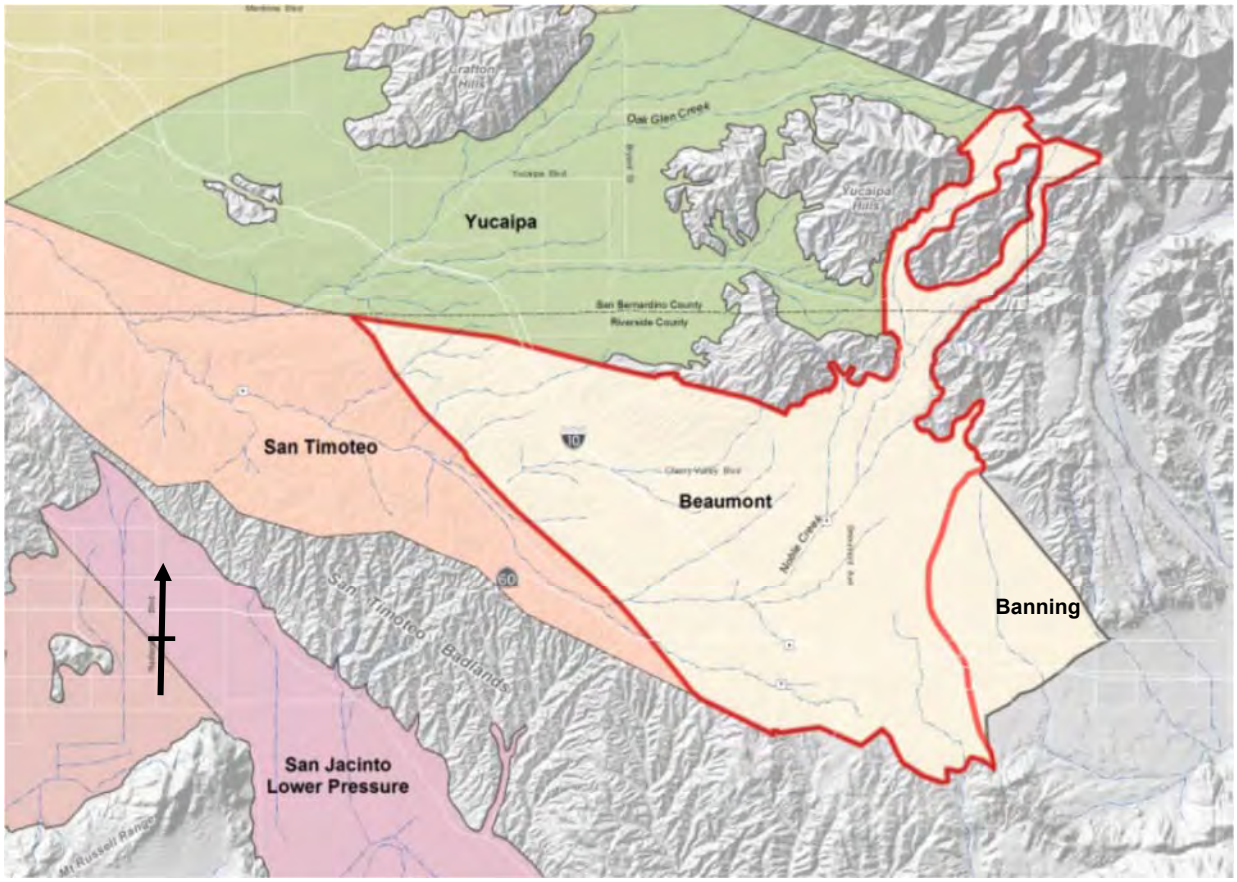


Figure 2-1
Beaumont Groundwater Management Zone and Adjacent Management Zones

Table 2-5
Surface Water Quality Objectives, mg/L

Parameter	San Timoteo Creek, Reach 3	Little San Gorgonio Creek
TDS	Surface water objectives not established for San Timoteo Creek Reach 3; underlying Management Zone objectives apply	230
Total Hardness		125
Sodium		50
Chloride		40
Total Inorganic Nitrogen (TIN)		3
Sulfate		45
Chemical Oxygen Demand (COD)		5

Table 2-6
Groundwater Management Zone Quality Objectives, mg/L

Parameter	Maximum Benefit			Anti-degradation		
	Beaumont	San Timoteo	Yucaipa	Beaumont	San Timoteo	Yucaipa
TDS	330	400	370	230	300	320
Total Hardness	--	--	--	--	--	--
Sodium	--	--	--	--	--	--
Chloride	--	--	--	--	--	--
TIN	5.0	5.0	5.0	1.5	2.7	4.2
Sulfate	--	--	--	--	--	--

The RWQCB revised the wastewater discharge permits for the City of Beaumont and YVWD and agreed to coordinate with the Colorado River Region 7 to ensure discharges from the City of Banning comply with the maximum benefit requirements in the Beaumont Groundwater Management Zone (Beaumont GMZ). The RWQCB will consider issuing waste discharge requirements for BCVWD.

The maximum benefit objectives of 330 mg/L TDS and 5 mg/L nitrate-nitrogen (nitrate-N), as a 10-year running average, may require dilution (blending) of the recycled water. This is acceptable. Such dilution shall be limited to reverse osmosis permeate (product water), imported water, or new stormwater. New stormwater recharge is defined as storm water recharged in quantities greater than historical amounts, i.e., net increase over the groundwater management zone since January 1, 2004.

RWQCB Discharge Requirements

Currently, the City of Beaumont's Wastewater Treatment Facility discharges into Cooper's Creek, a tributary of San Timoteo Creek, an effluent dominated stream.

BCVWD's non-potable water system currently relies on non-potable groundwater supplemented with potable groundwater. Screened untreated imported SPW is proposed to be used in BCVWD's non-potable water system in the near future. BCVWD anticipates using recycled water from the City of Beaumont. The subsequent Sections which follow discuss the RWQCB's discharge requirements for the City of Beaumont's Wastewater Treatment Plant. Only some requirements are shown in the tables which follow. Refer to actual discharge permits for more details.

Table 2-7

Beaumont GMZ Maximum Benefit Commitments by YVWD, Cities of Beaumont and Banning, BCVWD and SGPWA (Source: Attachment to RWQCB Basin Plan Amendment Resolution R8-2017-0014)*

1. Develop, implement and provide annual reporting for a surface water monitoring program. *This was submitted and approved; subsequently the RWQCB required revisions; the agencies agreed to review it and the groundwater monitoring program (#2 below) during the triennual ambient water quality report preparation.*
2. Develop, implement and provide annual reporting for a groundwater monitoring program. *This was submitted, approved and is being implemented; the agencies agreed to review it and the surface water monitoring program (#1 above) during the triennual ambient water quality report preparation*
3.YVWD to complete construction of a wastewater and/or groundwater desalter(s) and brine disposal facilities. *This has been completed and is operational.*
4. City of Beaumont to plan, schedule, and construct a wastewater and/or groundwater desalter(s) and brine disposal facilities. Implement the plan and schedule on RWQCB approval. *Construction of brine disposal facilities is complete. Construction of the wastewater plant upgrade is nearing completion (2022).*
5. City of Banning to prepare a wastewater and/or groundwater salt mitigation plan. Implement the plan on RWQCB approval. *This is required 6 months before the City plans on implementing recycled water use or recharge in the Beaumont GMZ.*
6. YVWD, City of Beaumont, City of Banning (at the onset of recycled water use in the Beaumont Basin), BCVWD and SGPWA shall implement non-potable water supply systems using recycled water to serve water for irrigation purposes and direct non-potable reuse. The non-potable supplies used in the Beaumont GMZ shall comply with a 10-year running average TDS concentration of 330 mg/L or less, and, in addition, for any non-irrigation resuse that has the potential to affect groundwater quality, nitrate-N shall be less than or equal to the 5 mg/L nitrate-N maximum benefit objective (taking the nitrogen los coefficient into consideration) *BCVWD constructed a pipeline connection to the East Branch Extension and completed Phase I of their Groundwater Recharge Facility in 2006 and began to recharge imported SPW. Since then BCVWD has completed Phase II of the Groundwater Recharge Facility. BCVWD has constructed over 50 miles of a non-potable water system which will use a blend of imported water and non-potable groundwater until recycled water is available from the City of Beaumont. The Basin Plan Amendment (2019) require the recycled water directly used for irrigation or groundwater recharge to have a 10-year running average TDS concentration of 330 mg/L or less and for any non-irrigation reuse that has the potential to affect groundwater quality, the 10-year running average nitrate-N shall be 6.7 mg/L or less taking the 25% nitrogen loss coefficient into account to ensure a 5 mg/L maximum benefit objective is met. Blending with reverse osmosis product water, new stormwater and/or imported water is acceptable to meet those concentration limits. Compliance shall be measured as the 10-year weighted running average of all water sources added to the system and used in the Beaumont GMZ.* *It is worth noting that the City of Beaumont's revised waste discharge permit (R8-2015-0026) specifies a TDS concentration of 330 mg/L over a 12-month flow weighted average at the point where it enters BCVWD's recycled water system; so blending as described above does not appear to be allowed.*

Table 2-7 Continued

Beaumont GMZ Maximum Benefit Commitments by YVWD, Cities of Beaumont and Banning, BCVWD and SGPWA (Source: Attachment to RWQCB Basin Plan Amendment Resolution R8-2017-0014)*

7. The recharge of recyled water in the Beaumont GMZ shall be limited to the amont that can be blended with other recharge sources or reverse osmosis diluent (product water) to achieve an 10-year running average equal to or less than the 330 mg/L maximum benefit TDS objective and less than or equal to the 5 mg/L nitrate-N maximum benefit objective (taking the nitrogen loss coeffient into consideration). Submit documentation on the amount, TDS and nitrogen quality of all sources of recharge and recharge locations. If new stormwater is used as blending source, submit to the RWQCB for approval a report which identifies the methodology used in the baseline (2004) and new stormwater (post2004) recharge. Identify the amount, locations, TDS and nitrogen quality of the stormwater and imported water recharge. Include the manner in which the enhanced stormwater/imported water recharge facility will assure, individually or with other facilities, compliance with the 330 mg/L TDS and 5 mg/L nitrate-N 10-year running average maximum benefit objective. *See "6" above for a comment on the City of Beaumont's discharge limit is the same as the maximum benefit objectives and blending does not appear to be acceptable.*
8. Submit an anti-degradation salt mitigation plan and implementation schedule. Implement the salt mitigation plan within 30 days of RWQCB finding that maximum benefit is no longer being achieved. *This still needs to be prepared and submitted.*
9. Determine ambient groundwater quality beginning July 1, 2014 and every 3 years thereafter. *The agencies must follow the methodology used by the Nitrogen/TDS Task Force to develop the TDS and nitrate-N antidegradation water quality objectives, i.e., 20-year running averages.*

***Note:** Beaumont GMZ Maximum Benefit Commitments by YVWD, Cities of Beaumont and Banning, BCVWD and SGPWA first proposed/implemented in 2011, and do not include any updated (as of 2022) maximum benefit requirements for individual agencies

City of Beaumont

The City of Beaumont is regulated under Order R8-2015-0026 (NPDES CA 0105376) which was adopted by the Regional Water Quality Control Board on July 21, 2015 and was scheduled to expire on July 31, 2020. The permit identifies two discharge points and three recycled water locations as shown in Table 2-8. The concentration limits for the TDS and TIN are 12-month, flow weighted, moving averages. The 1.8 mgd is environmental mitigation flow.

Table 2-8
City of Beaumont Discharge Locations and Limits for TDS and TIN

Discharge Point	Location	Receiving Water	TDS, mg/L	TIN, mg/L
DP-001	Cooper's Creek	Cooper's Creek	400 mg/L up to 1.8 mgd; 300 mg/L for over 1.8 mgd	6 mg/L up to 1.8 mgd; 3.6 mg/L for over 1.8 mgd
DP-007	Marshall Creek	Marshall Creek	230 mg/L	2.0 mg/L
R-001	Tukwet Canyon Golf Course	BMZ & STGMZ Groundwater	330 mg/L	--
R-002	Oak Valley Golf Course	BMZ Groundwater	330 mg/L	--
R-003	BCVWD Recycled Water System	BMZ Groundwater	330 mg/L	--

The limits for TDS and TIN in Table 2-8 are measured at the discharge to Cooper's Creek; this includes the effluent used for recycling. Although the Basin Plan Water Quality Objectives allow the TDS and TIN (for recharge) to be met through blending with reverse osmosis product water, new stormwater, or imported water, blending is not allowed in the waste discharge permit to meet TDS limits. Note that for the City of Beaumont, there is no TIN limit for recycled water irrigation use. This is based on the Regional Board's assumption that the landscaping and plant materials will take up the nitrogen plus some denitrification will occur in the soil zone before the water would actually reach the groundwater table.

Table 2-9 presents the biochemical oxygen demand (BOD), total suspended solids (TSS) and Ammonia-N discharge limits.

Table 2-9
City of Beaumont Effluent Limits for BOD, TSS and Ammonia-N at DP-001 and DP-007

Parameter	Units	Effluent Limitations		
		Average Monthly	Average Weekly	Maximum Daily
Biochemical Oxygen Demand (BOD) 5-day @ 20º C	mg/L (lbs/day)	20 (667)	30 (1,001)	--
Total Suspended Solids (TSS)	mg/L (lbs/day)	20 (667)	30 (1,001)	--
Ammonia-Nitrogen	mg/L (lbs/day)	4.5 (150)	--	--

In Table 2-9, the average monthly percent removal of BOD and TSS must be at least 85%. The treatment processes to produce Title 22 compliant recycled water will result in effluent BOD and TSS concentrations much less than the values in Table 2-9.

The discharge to surface waters shall at all times be a filtered and subsequently disinfected wastewater and shall meet the following limitations per Order R8-2015-0026:

A) “Filtered wastewater” means an oxidized wastewater that has been coagulated and passed through a bed of filter media pursuant to the following:

(1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual, or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and

(2) The turbidity of the filtered wastewater shall not exceed any of the following:

a) An average of 2 NTU within a 24-hour period;

b) 5 NTU more than 5 percent of the time within a 24-hour period; and

c) 10 NTU at any time

B) Disinfection: The discharge shall meet the following:

When a disinfection process combined with the filtration process is utilized, the combined process shall demonstrate inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration. The UV disinfection process shall be approved by the Division Chief of the State Water Resources Control Board’s DDW and the Discharger shall comply with all operational parameters specified by DDW.

C) Coliform: The disinfected wastewater shall meet the following:

1) The weekly median concentration of total coliform bacteria shall not exceed a Most Probable Number (MPN) of 2.2 total coliform bacteria per 100 milliliters (ml). To comply with the limit, the 7-day median MPN must not exceed 2.2 per 100 milliliters on any day during the week. However, only one violation is recorded for each calendar week, even if the 7-day median MPN value is greater than 2.2 for more than one day in the week,

2) The number of total coliform bacteria shall not exceed an MPN of 23 total coliform bacteria per 100 ml in more than one sample in any 30-day period, and

3) No total coliform bacteria sample shall exceed an MPN of 240 total coliform bacteria per 100 ml.

D) pH

The pH of the discharge at shall be maintained between 6.5 to 8.5 pH units. Compliance with pH limits shall be determined as follows:

The total time during which the pH is outside the range of 6.5-8.5 pH units shall not exceed 7 hours and 26 minutes in any calendar month; and

No individual excursion from the above range shall exceed 60 minutes.

E) Toxicity Requirements

There shall be no acute or chronic toxicity in the discharge nor shall the discharge cause any acute or chronic toxicity in the receiving water. All waters shall be maintained free of substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. This Order contains no numeric limitation for toxicity. However, the Discharger shall conduct chronic toxicity monitoring.

The Discharger shall implement the accelerated monitoring as specified in Attachment E of the waste discharge order when the result of any single chronic toxicity test of the effluent exceeds 1.0 Chronic Toxicity Unit (TUc).

The recycled water shall meet the requirements for Disinfected Tertiary Recycled Water at all times and meet the requirements in A), B), and C), above. In addition, there are requirements for establishing rules and regulation for recycled water use, site inspections, etc. Whenever new users are added to the system, a report needs to be prepared and submitted to the RWQCB and DDW. Each user shall designate site supervisor who shall be trained in recycled water use and who shall be responsible for the operation of the system on-site and enforcing all of the rules and regulations.

Division of Water Rights Constraints

The California SWRCB Division of Water Rights administers the state's water rights system. This includes any diversion of flow from streams receiving effluent discharges from permitted wastewater treatment facilities. If an existing wastewater treatment has been discharging to a stream, such as the City of Beaumont to Cooper's Creek, and the discharging agency wishes to recycle and reuse some of the treated effluent discharged to the creek for some beneficial use, such as irrigation, the discharging agency must file a wastewater "change petition" with the Division of Water Rights. In order for the Division of Water Rights to approve the change petition SWRCB must be able to find that the proposed change will not injure other legal users of water, will not unreasonably harm instream uses, and is not contrary to the public interest. Of particular interest is reduction in flow that could result in an adverse impact on habitat of threatened or endangered species. A petition is not needed for changes in the discharge or use of treated wastewater that do not result in decreasing the flow in any portion of a watercourse, or when the discharge is directly to the ocean or a bay. Also, reductions in discharge associated with reduced plant influent due to water conservation measures are not subject to the change petition requirement.

The City of Beaumont and BCVWD had informal consultation with U.S. Fish and Wildlife Service relative to reducing the discharge to Cooper's Creek as part of BCVWD's application in 2007 for State Revolving Fund Loan. It was agreed at that time that flows to Cooper's Creek will not be less than 1.8 million gallons per day, the equivalent of the flows discharged in 2003.[2] The City

[2] Karen Goebel USFWS (2008). Letter to Ms. Michelle Jones SWRCB, Informal Consultation for Beaumont Cherry Valley Water District Recycled Water System (State Revolving Fund (SRF) Loan No. C-06-5157-110), Riverside county, California, February 29.

has discussed this as part of the WWTP upgrade and expansion, and representatives from the Division of Water Rights indicated that no further action is required as long as at least 1.8 mgd of effluent is left in the creek.[3]

Recent Governmental Constraints Affecting Recycled Water Quantity and Irrigation Use

Governor Brown's Executive Order B-40-17 and AB 1668 affect how water will be used in California that potentially affect the amount of recycled water available. These both stem from the recent drought and the governor's "Making Conservation a California Way of Life."

AB 1668

AB1668 which has been chaptered as §10609.4(a) of the Water Code, requires the DWR to make recommendations to the legislature on standards for indoor residential water use. An allowance of 55 gallons per capita per day (gpcd) is the immediate limit; January 1, 2025, this will drop to 52.5 gpcd and possibly to 50 gpcd by January 1, 2030. This will potentially reduce the amount of recycled water available. It should be pointed out that these water use restrictions do not include commercial, institutional, and industrial (CII) wastewater which would add an estimated 10 to 15 gpcd to these values. Water Code §10609.10 requires DWR to conduct studies and recommend performance measures for CII water use.

This will likely have an effect on the amount of recycled water produced over time.

Executive Order B-40-17 and the Model Water Efficient Landscape Ordinance

As a result of Governor Brown's Executive Order B-40-17, the SWRCB conducted rulemaking to prohibit wasteful water use practices and proposed changes to California Code of Regulations (CCR) Title 23, Division 3. The proposed changes were the addition of Chapter 3.5, Article 2 – Wasteful and Unreasonable Water Uses. As of July 2019, these revisions have not been made. Provisions which affect recycled water include:

- The application of water to irrigate turf and ornamental (non-functional) landscapes during and within 48 hours after measurable rainfall of at least one-fourth of one inch of rain. In determining whether measurable rainfall of at least one fourth of one inch of rain occurred in a given area, enforcement may be based on records of the National Weather Service, the closest CIMIS station to the parcel, or any other reliable source of rainfall data available to the entity undertaking enforcement of this subdivision.
- As of January 1, 2025, the irrigation of turf on public street medians or publicly owned or and maintained landscaped areas between the street and sidewalk, except where: (i) the turf serves a community or neighborhood function, including, but not limited to,

[3] Personal Communication, email (2019). Thaxton Van Belle (City of Beaumont) to Kristine Day (City of Beaumont, Brian Knoll (Webb Associates). Confirms discussion with Darren Tran, Division of Water Rights, Permitting Section, April 16.

recreational uses and civic or community events; (ii) the turf is irrigated incidentally by an irrigation system, the primary purpose of which is the irrigation of trees; or (iii) the turf is irrigated with recycled water through an irrigation system installed prior to January 1, 2018.

Both of these provisions will likely result in a reduction of the use of recycled water.

The City of Beaumont and the County of Riverside have adopted landscape ordinances which follow DWR's Model Water Efficient Landscape Ordinance (MWELO). Chapter 17.06.030 Landscaping Standards for the City of Beaumont requires that landscapes serviced entirely by recycled water not exceed a maximum water demand of 70 percent of the reference evapotranspiration (ETo). It also prohibits the new installation of turf grass in medians and parkways.

BCVWD believes that many of the common areas and street medians landscaped with turf will eventually be converted over to more water efficient landscaping following the City's Ordinance resulting in a substantial reduction in the amount of recycled water being used.

Section 3

Service Area Population

Background

Focus for this non-potable water master plan will be on the City of Beaumont and the community of Cherry Valley. The historical and projected populations for the City of Beaumont and the community of Cherry Valley are discussed in this section to provide a basis for estimating the wastewater flows and ultimately the recycled water available from these sources over time. The community of Cherry Valley uses on-site septic tank systems. A facilities plan to sewer the developed area of Cherry Valley was prepared for BCVWD by a consultant; however, the project did not move forward. It is possible that at some point in the future, a sewer system may be necessary if significant development occurs.

BCVWD Historical Population

Table 3-1 shows historic and current population for the District's service area.

The data in Table 3-1 came from several sources:

- 1980 and 1990 populations and household information – U.S. Census Bureau, 2000 Census of Population and Housing, Population and Housing Unit Counts, PHC-3-6, California, Washington D.C., 2003. This data was used for the City of Beaumont. Data for Cherry Valley for this period was estimated.
- 2000, 2010 population and household information – U.S. Census Bureau American Fact Finder for Beaumont, CA and Cherry Valley CDP[5], CA.
- 2015 population – estimated for Cherry Valley based on historic growth from 2000 to 2010. Used data from City of Beaumont City Building and Safety Department, Annual Permit Information for period 2009 – 2019. The published U.S. Census data classifies a "household" as an "occupied residential unit." This was carried through for year 2015 based on the people per household reported in the 2010 census. Total housing units were estimated based on a vacancy factor of 2.1 percent in new homes in Riverside-San Bernardino-Ontario area.[6]

[5] CDP = Census-designated Place

[6] USHUD (2017). Comprehensive Housing Market Analysis, Riverside-San Bernardino-Ontario, U.S. Department of Housing and Urban Development, Office of Policy Development and Research, January 1.

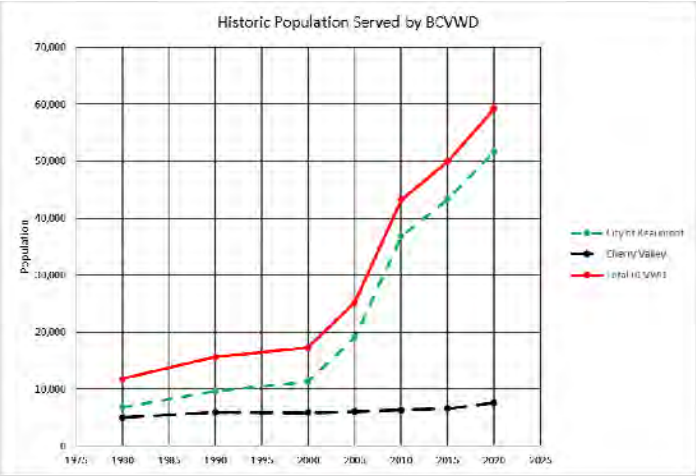
- 2020 planning estimate population – Estimated for Cherry Valley based on historic growth from 2018. Estimate for the City of Beaumont Based on housing completions from City Planning Department, Major Project Status for period 2010 through 2019, and District staff discussion with various developers regarding construction progress for major projects in the District's service area (ongoing projects).
- 2020 Census Data population – 2020 U.S. Census Population Data was published in August, 2020, and has been included below for reference. For consistency, the 2020 population estimates, which were formulated for the District's 2020 Urban Water Management Plan (UWMP), will be used for calculations of recycled water generation in this plan.

Table 3-1
Historical Population and Housing in BCVWD Service Area

	1980	1990	2000	2005	2010	2015	2020 - Planning Estimate	2020 - Census Data
City of Beaumont								
Population	6,818	9,685	11,384	19,105	36,877	43,370	51,647	53,036
Households	2,852	3,718	3,881	6,307	11,801	12,759		
People/Household	2.39	2.60	2.93	3.03	3.12	3.18		
Housing Units			4,258	6,949	12,908	13,563		
Occupied Housing Units			3,881	6,307	11,801	12,759		
Cherry Valley								
Population	5,012	5,945	5,891	6,126	6,362	6,595	7,610	6,509
Households	2,023	2,530	2,310	2,416	2,612	2,692		
People/Household	2.48	2.35	2.55	2.54	2.44	2.45		
Housing Units			2,627	2,750	2,874	2,903		
Occupied Housing Units			2,434	2,523	2,612	2,692		
Total								
Population	11,830	15,630	17,275	25,231	43,239	49,965	59,258	59,545
Households	4,875	6,248	6,191	8,723	14,413	15,451		
People/Household	2.43	2.5	2.79	3	3.00	3.23		
Housing Units			6,885	9,699	15,782	16,466		
Occupied Housing Units			6,315	8,830	14,413	15,451		

Figure 3-1 shows the population growth in the City of Beaumont and Cherry Valley graphically from 1980 to 2020.

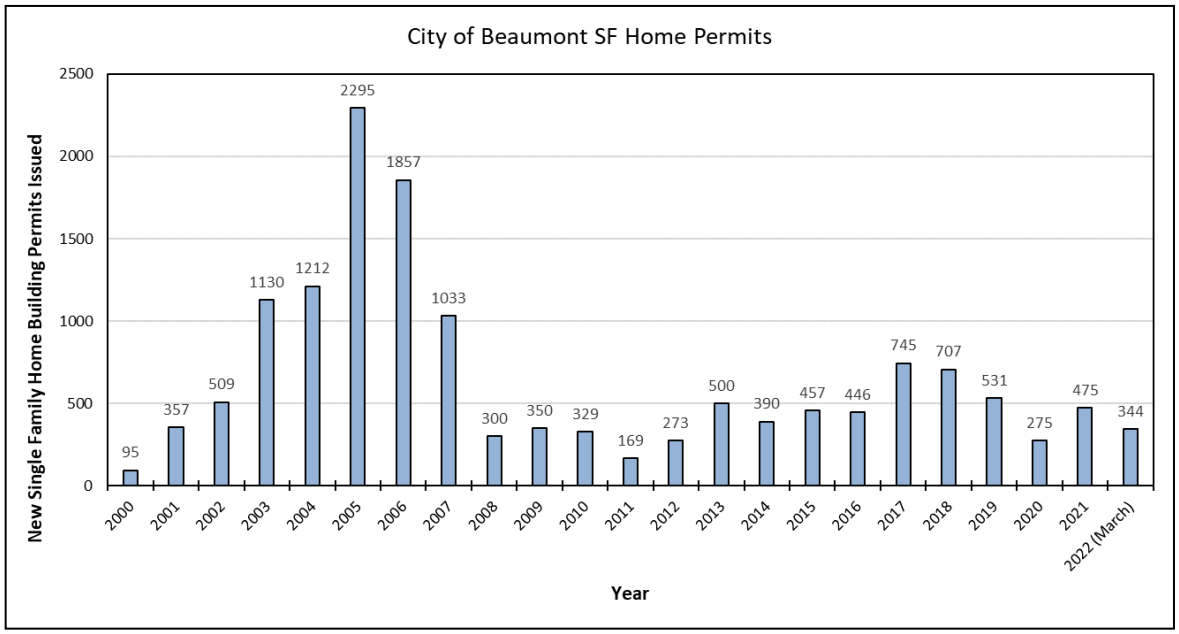
Figure 3-1
Historical Population Growth in BCVWD Service Area



The data in Table 3-1 and Figure 3-1 show very rapid growth for the City of Beaumont from the year 2000 to 2010. About 2/3 of that growth occurred between 2000 and 2007 based on building permits issued by the City of Beaumont. In mid-2008 when development slowed markedly following the economic turndown in the U.S. and California. Since 2010 the service area population is growing at about 3.8 percent per year (linear); almost all due to growth in the City of Beaumont. The population in Cherry Valley showed little growth since 1980. A few homes were constructed, but not many.

Figure 3-2 shows the number of single-family home building permits finaled in the City of Beaumont for the years 2001 through March 2022 . The permits started to increase in 2001 and reached their peak in 2006 with just over 2000 new home permits issued for that year. The number of new homes declined to a low of 186 in 2011. Over the last 10 years, new home finals averaged 395 per year, and 477 over the last 5 years. The 21-year average was 665 per year. Since 2001, there have been over 14,000 new single family homes finaled in the City of Beaumont.

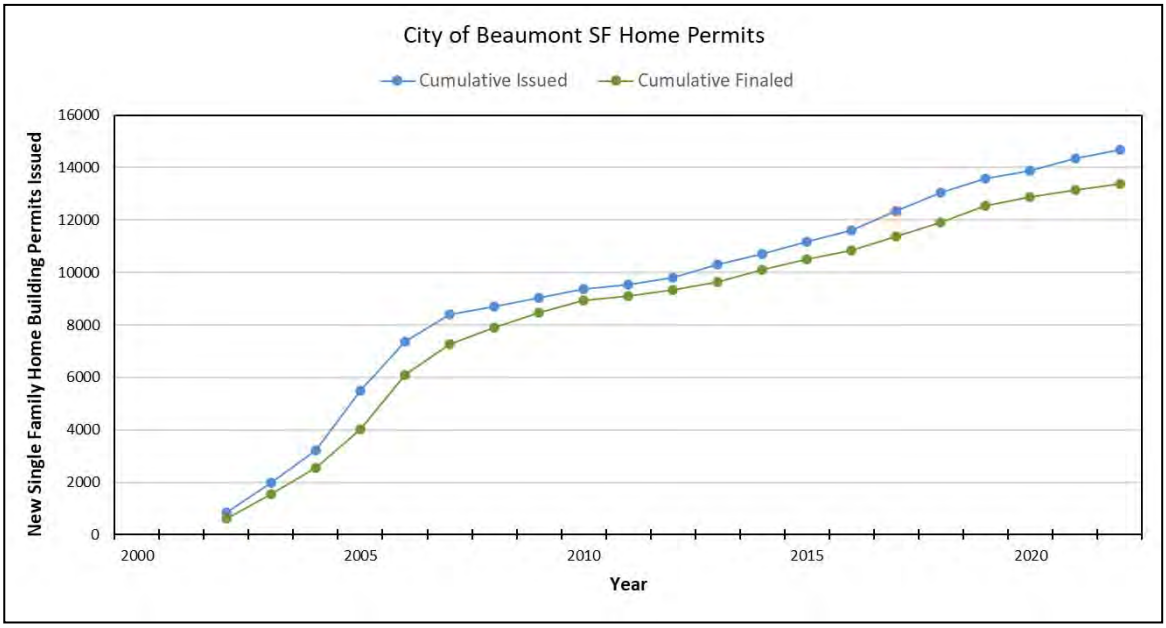
Figure 3-2
Single Family Home Building Permits Finaled in City of Beaumont



*2022 Permits include permits issued as of March 31, 2022

Figure 3-3 shows the growth in single family home building permits issued by the City since 2000. Future growth, at least in the near term will likely be in the range of 450 to 550 permits per year, although some developers have projected slightly higher amounts in their build-out forecasts.

Figure 3-3
Growth in Beaumont as Shown by Single Family Home Building Permits



Build-out Population

The BCVWD service area build-out or "saturation" population was determined using the City of Beaumont's Zoning Map from the City's General Plan in conjunction with the District's Geographic Information System (GIS) to determine the total areas of the various zoning categories in the District's SOI. Actual GIS data was obtained from the City and integrated into the District's GIS system to determine the land use within the District's SOI. The zoning designations included a range of dwelling units/acre. An average value of dwelling units/acre was used in the build-out analysis. The BCVWD service area build-out or "saturation" population of approximately 134,000[10] was determined using the City of Beaumont's Zoning Map and Table 3.2a from the City' General Plan (2020). District staff met with the City of Beaumont to confirm the current and projected retail populations[11]. The buildout population within the District's Sphere of Influence (SOI) is estimated to be about 147,620 based on BCVWD estimates of current and proposed land use in the area.

The same approach was used for Cherry Valley, only this time data from Riverside County General Plan, Pass Area Land Use Plan was used[12]. Again the GIS data set was obtained from the County and integrated into the District's GIS system to determine the land use category areas within the District's SOI. Build-out population for Cherry Valley, within the BCVWD's SOI is estimated to be 13,620 people. Analyzing Riverside County land use boundaries (GIS) within the District's service area and SOI. The total build-out population in BCVWD's service area is projected to be 147,620, (i.e., 134,000 + 13,620). Estimates of the District's buildout population were determined in 2020/2021 as part of the District's 2020 UWMP update.

The build-out population is a function of the local zoning and annexations; either could change at any time resulting in an increase or reduction in the build-out population. Changes in the SOI boundary by LAFCO would also affect the ultimate population served.

Build-out EDUs

Based on the build-out populations and the estimated people/EDU presented above, the estimated number of EDUs at build-out along with the EDUs remaining to be constructed are summarized in Table 3-2. Table 3-2 shows the population at build-out will be about twice the current (2020) population in the BCVWD service area, all based on the current general plans. Build-out is not expected to occur until well after 2045.

[10] Calculated based on City of Beaumont General Plan (2020), Table 3.2a, Page 45. Based on Riverside County average household size of 3.28 people/household.

[11] Per meeting with BCVWD and City of Beaumont staff held on 06/09/2021.

[12] The Pass Area Land Use Plan, October 7, 2003. (Part of Riverside County General Plan)

Table 3-2
Estimated Build-out EDUs

	City of Beaumont	Cherry Valley	BCVWD Service Area
Estimated Build-Out Population	134,000	13,620	147,620
People/EDU	3.28	2.88	3.08
Estimated EDU's at Buildout (Calculated)	40,854	4,729	47,929
Current Population (2020 Planning Estimate)	51,647	7,610	59,257
Population Increase to Buildout	82,353	6,010	88,363
Estimated EDUs remaining to be constructed to Buildout (Calculated)	25,108	2,087	28,689

Projected Service Area Growth

City of Beaumont

Review of the City of Beaumont's Major Project Status Report[13] listed five projects that were currently under various stages of development. These are listed in Table 3-3.

BCVWD used the developers' general and specific plans for the projects in Table 3-3 in conjunction with a District staff field survey on 12/16/2020 to verify the construction progress and estimate the number of housing units (Equivalent Dwelling Units) remaining. There are an estimated 3,155 EDUs in the current on-going projects yet to be constructed as of December 2021[14] .

Table 3-4 presents a list of other projects in various stages of approval by the City of Beaumont. The total number EDUs is estimated to about 9,200. Most, if not all, of these projects will have some non-potable water demand.

[13] City of Beaumont, Major Project Status Report, October 18, 2018.

[14] District staff field survey on December 16, 2020, be E. Ward.

Table 3-3
Major Projects within BCVWD Service Area Under Construction

Development Name	Total Housing Units Approved	Estimated Housing Units Yet to be Constructed (Dec 2020)	Estimated Build-out Year
Sundance	4,450	808	2025
Fairway Canyon SCPGA	3,300	1,650	2035
Olivewood (Heartland)	981	697	2030
Hidden Canyon Industrial Park (Beaumont Distribution Center)	Industrial	-	2021
Sundance Corporate Center	Commercial	-	2021
Totals	8,730	3,155	

Table 3-4
Other Major Development Projects in BCVWD's Service Area and Sphere of Influence (or SOI)

Development Name	Total Probable EDU's	Estimated Build-out Year	Status (January 2022)
Beaumont Industrial Park (Industrial) [1,2]	70	2040	
Beaumont Downtown District	900	Unknown	Likely Ongoing for Many Years
Beaumont Village (Mixed Use) [1,2]	2350	Unknown	
Beaumont Pointe (Jack Rabbit Trail – Commercial/Industrial) [1]	221	2027	
CJ Foods (Industrial)	225	2023	Incremental EDU increase per year, beginning 2018 and ending in 2023
Dowling Orchard (Industrial)[1,2]	50	Unknown	
Potrero Logistics (Hidden Canyon II) [1,2]	59	2025	1 million sf building to come online late 2022
I-10 & Oak Valley Parkway (Commercial)[1]	200	2035	
Kirkwood Ranch	391	2040	Specific Plan (1991), Tent. Tract Map 27357 Approved
Loma Linda/BUSD (Commercial/Industrial)[1,2]	100	Unknown	Likely to be sold by owners and developed as commercial
MCM Chicken Ranch (Industrial) [1,2]	50	Unknown	
Noble Creek Vistas (Tract 29522)	298	Unknown	
Noble Creek Meadows (Tract 29267)	274	2025	
Oak Creek Village (Commercial) [1,2]	100	Unknown	
Oak Valley Parkway/Oak View Drive (Commercial) [1,2]	75	Unknown	
Olivewood (Commercial) [1,2]	40	2035	
Potrero Creek Estates [1,2]	700	Unknown	Specific Plan (1989)
Riedman Properties (Merlin Properties)	140	2030	
SDC Fairway Canyon Commercial[1,2]	75	Unknown	
Sunny Cal Egg Ranch	529	2040	
Taurek	244	Unknown	
Legacy Highlands (Residential, Commercial, Industrial)[2]	2,542	Unknown	Project EIR invalidated late 2021

Table 3-4 (cont.)
Other Major Development Projects in BCVWD's Service Area or SOI

Development Name	Total Probable EDU's	Estimated Build-out Year	Status (January 2022)
Tournament Hills Phase 3, (TM 36307)	284	2027	Tract 36307, Amendment to Oak Valley Specific Plan Approved. Grading & utilities construction underway
Oak Valley Towncenter (NW Corner Beaumont Avenue & Oak Valley Parkway)	60	2030	
Manzanita (Tract 32850)	95	2025	
Xenia Apartments[3]	100	2029	
Totals	**9,272**		

(1) Commercial/Industrial "EDUs" determined based on 0.546 AFY/EDU, or approximately 487 gal/EDU/day
(2) District staff estimated EDUs due to project not fully entitled

The housing units yet to be constructed in Table 3-2 plus the EDUs in the other projects in Table 3-3, total 12,400 EDUs (not including Commercial/Industrial EDUs) in the District's service area or SOI. This would result in an increase in population of about 35,000 people, based on 3.28 people per EDU, bringing the total Beaumont population to about 95,000 (rounded). Based on the estimated build-out year for each project in Table 3-4, this is not anticipated to occur until after 2045. The 3.28 people per EDU is based on the average density in the County of Riverside. See Table 3-2, presented previously.

This population estimate is below the adjusted build out population presented previously in Table 3-2 (147,620), which was based on average densities within the various land use categories.

Although the community of Cherry Valley, except for Highland Springs Village, does not have sewers, its population growth is discussed in this non-potable water master plan since sewers may be installed at some point, perhaps 20 to 25 years from now or longer, and the wastewater generated from the area could be treated and recycled.[16]

Table 3-5 presents the population projections used for calculations in this non-potable water master plan, based on the findings of the 2020 UWMP as previously discussed.

[16] The septic tank effluent is now a part of the Beaumont Basin Safe Yield per Watermaster's 2013 Reevaluation of the Beaumont Basin Safe Yield study completed by Thomas Harder & Co. with Alda, Inc. in Apr. 2014. When the area is sewered, this return flow will cease.

Table 3-5
Non-Potable Water Master Plan
Projected EDUs and Population in BCVWD Service Area
(Baseline 2018)

EDU Growth							
	Cumulative New EDUs						
	2020	2025	2030	2035	2040	2045	Buildout
Beaumont	1,947	4,026	6,293	8,732	10,693	12,502	
Cherry Valley	14	40	97	158	228	262	
Total	**1,961**	**4,066**	**6,390**	**8,890**	**10,921**	**12,764**	
Average New EDUs/Year	654	421	465	500	406	368	
Population Growth (Based on EDU Growth)							
Beaumont	51,647	58,467	65,901	73,901	80,335	86,266	134,000
Cherry Valley	7,610	7,682	7,838	8,005	8,197	8,290	13,620
Total	**59,257**	**66,149**	**73,739**	**81,906**	**88,532**	**94,556**	

Previous Projections for Growth in BCVWD's Service Area

Historic (prior to 2020 UWMP) near-term growth projections for the City of Beaumont and BCVWD service area as a whole are greater than that experienced. Growth rate in Cherry Valley from 1980 through 2015, based on U.S. Census Data and the American Fact Finder, was about 50 people year or less than 20 EDUs per year.

The following sub-sections discuss various alternative growth forecasts previously used for the service area. BCVWD believes that virtually all of the near-term growth in BCVWD's service area will occur in the City of Beaumont. For Cherry Valley, the projections in BCVWD's Water Master Plan are used and are constant for all of the City of Beaumont's EDU growth alternatives.

BCVWD believes that Cherry Valley will not see significant growth until after 2030 or so. The EDU projections in the following sections discuss various alternative growth patterns from the below listed sources.

For calculations of recycled water generation in this report, population growth projections determined in the District's 2020 UWMP, as discussed previously, are used. All other growth patterns and projections identified below are for historical information and reference only.

Note, the buildout population for the City of Beaumont of 134,000 is based on land use and population density data from the City's General plan. This buildout population is much larger

than any previous estimate of buildout population. Given that land use designations and projected population density are subject to change in future City General Plans, the projected buildout population may continue to change. Potential recycled water generation based on the 2020 UWMP buildout population projection was calculated and is provided in Section 4.

Projected Service Area Growth in 2015 Potable Water Master Plan

BCVWD used Equivalent Dwelling Units (EDUs) to calculate and project potable water demand. BCVWD's 2015 Potable Water Master Plan projected EDU growth based on discussions with the developers having on-going projects. The "base year" for the analysis was 2013. The EDU growth is summarized in Table 3-6. Based on recent experience in BCVWD's service area, the growth in EDUs presented in the 2015 Potable Water Master Plan and Table 3-6 may be overestimated. Since the preparation of the development projections in the 2015 Water Master Plan, BCVWD has experienced 6 years of growth at about 500 EDUs per year.

At the time the 2015 Potable Water Master Plan was in preparation, there were a number of tracts that started construction before the economic turndown brought construction to a "halt." A number of these tracts were fully graded with utilities already installed at the time the work was stopped. As a result they were "ready to go." Developers were very optimistic and projected relatively high sales after the downturn, which never really materialized. This was reflected in the high EDU growth in the 2015 Potable Water Master Plan (900+ EDUs/year). The growth was actually more gradual as shown in Figure 3-2 presented previously.

Based on current experience, as shown in Figure 3-2 and 3-3 presented previously, the values in Table 3-5 and the 2015 Potable Water Master Plan should be reevaluated when the potable water master plan is updated.

Table 3-6
Summary of New EDUs and Projected Population in BCVWD Service Area from Base Year 2018 (Based on BCVWD 2015 Potable Water Master Plan and Adjusted to 2018)

	Cumulative New EDUs							
	2018	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Beaumont	0	1,841	4,602	7,683	10,442	12,148	12,611	14,800
Cherry Valley	0	13	82	251	552	1,661	2,233	4,560
Totals	0	1,854	4,684	7,934	10,994	13,809	14,844	19,360
Average New EDUs/year		927	566	650	612	563	207	
Beaumont								
People/EDU	3.12	3.12	3.1	3.1	3.1	3.1	3.0	3.0
Population	48,237	53,981	62,503	72,054	80,607	85,896	86,070	92,300
Cherry Valley								
People/EDU	2.43	2.43	2.43	2.46	2.5	2.6	2.7	2.8
Population	6,738	6,770	6,937	7,355	8,118	11,057	12,767	20,000
BCVWD Service Area								
Population	54,975	60,751	69,440	79,410	88,725	96,952	98,837	112,300

WWTP Feasibility Study

The City of Beaumont's WWTP Feasibility Study[17] used a growth rate of 510 EDUs/year as a forecast for future development in the City of Beaumont for the next 20 years or so. This is consistent with the recent historical growth. Table 3-7 shows the growth in EDUs and population in BCVWD's Service Area based on 510 EDUs/year in Beaumont. Note that the projected growth in Cherry Valley is assumed to be the same as in Table 3-5, presented above.

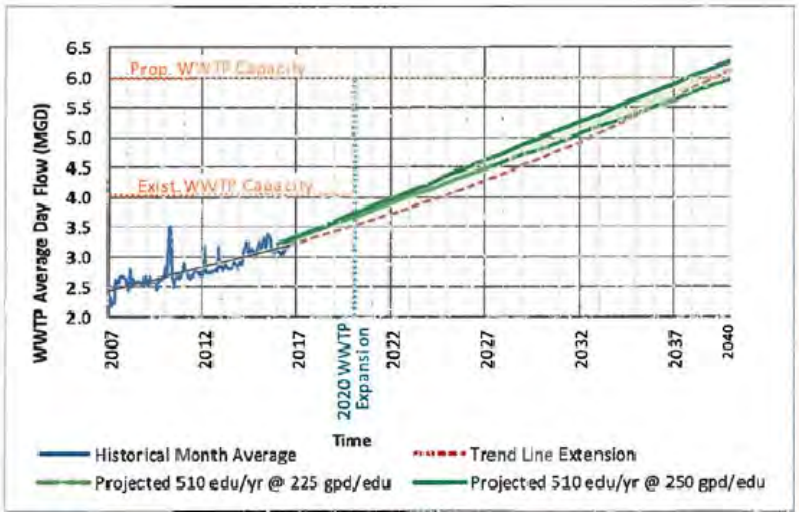
Figure 3-4, taken from the Feasibility Study, shows the projected wastewater flow, along with the average monthly flow from 2007 to present. In the study, the City used wastewater generation rates between 225 and 250 gallons/day/EDU (gpd/EDU). In Figure 3-4, the City's projection of wastewater flow from the 510 EDUs/yr growth rate tracks well with the growth in wastewater flow since 2007. Not considered in the City's flow projections is the impact of the State's mandated decrease in indoor water use (AB 1668 and SB 606). This will be addressed in a subsequent section of this Master Plan.

[17] City of Beaumont (2016). Feasibility Study for WWTP Expansion & Salt Mitigation, prepared by Albert A. Webb Associates/Aqua Engineering. December

Table 3-7
Projected EDUs and Population in BCVWD Service Area
City of Beaumont WWTP Feasibility Study
(Baseline 2018)

	Cumulative New EDUs							
	2018	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Beaumont	0	1,020	3,570	6,120	8,670	11,220	13,770	14,800
Cherry Valley	0	13	82	251	552	1,661	2,233	4,560
Totals	0	1,033	3,652	6,371	9,222	12,881	16,003	19,360
Beaumont								
People/EDU	3.12	3.12	3.1	3.1	3.1	3.1	3.0	3.0
Population	48,237	51,419	59,304	67,209	75,114	83,019	89,547	92,300
Cherry Valley								
People/EDU	2.43	2.43	2.43	2.46	2.5	2.6	2.7	2.8
Population	6,738	6,770	6,937	7,355	8,118	11,057	12,767	20,000
BCVWD Service Area								
Population	54,975	58,189	66,241	74,564	83,232	94,076	102,314	112,300

Figure 3-4
City of Beaumont Projected Wastewater Flow



Source: City of Beaumont, Feasibility Study for WWTP Expansion & Salt Mitigation (Webb/Aqua Engineering)

White Paper Model

In late 2017 through 2018, BCVWD staff prepared a series of White Papers related to regional water supply, particularly imported water needs, along with a financial strategy to implement and fund additional imported water supply. As part of the development of these White Papers, BCVWD reviewed the projects listed previously in Tables 3-3 and 3-4 to identify a reasonable build-out plan for the projects now under or about to start construction and a start-up and build-out plan for those projects which are still on the horizon. This was done on a year-by-year basis from 2017 through 2040. In addition to the projects listed in Tables 3-3 and 3-4, twenty (20) "infill" and miscellaneous projects were included which were not a part of major developments

In the White Paper model, an evaluation was made of each of the major developments within BCVWD's service area which were previously identified in Tables 3-3 and 3-4. Start-up years and build-out rates were estimated. Individual and small infill projects were included. The additional EDUs associated with schools, commercial developments, etc. to support the residential EDUs were also included. The White Paper Analysis resulted in an average of about 500 new EDUs per year and is consistent with the City of Beaumont's growth projection.

Table 3-8 shows the development rate for EDUs used in the White Paper Model.

Table 3-8
Projected EDUs and Population in BCVWD Service Area Used in White Paper Model (Baseline 2018)

	Cumulative New EDUs							
	2018	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Beaumont	0	1,098	3,556	6,086	8,598	10,092	11,092	14,800
Cherry Valley	0	13	82	251	552	1,661	2,233	4,560
Totals	0	1,111	3,638	6,337	9,150	11,753	13,325	19,360
Beaumont								
People/EDU	3.12	3.12	3.1	3.1	3.1	3.1	3.0	3.0
Population	48,237	51663	59,261	67,104	74,891	79,522	81,513	92,300
Cherry Valley								
People/EDU	2.43	2.43	2.43	2.46	2.5	2.6	2.7	2.8
Population	6,738	6,770	6,937	7,355	8,118	11,057	12,767	20,000
BCVWD Service Area								
Population	54,975	58,432	66,198	74,459	83,009	90,579	94,280	112,300

City Spreadsheet

The City Manager (2018 – 2019) for the City of Beaumont developed a spreadsheet (City Spreadsheet) of new development for budgeting and strategic planning purposes dated February 2, 2019. The model considered market "ups and downs" in new EDUs and a slight decline in new single family home construction because of the impact of the Summerwind Ranch and Mesa Verde developments in the City of Calimesa on new house construction and sales in Beaumont. Table 3-8 shows the projections and growth. The City Spreadsheet only went to 2038; BCVWD extended the data to 2040 using the City's 2037 and 2038 EDU growth rate. The residential EDUs includes some multi-family units. The people per EDU used in Table 3-6 corresponds to the City's equivalent population per EDU based on the blend of single family and multi-family units. The City's spreadsheet did not include any Cherry Valley data, so BCVWD use the Cherry Valley growth projections set forth in the previous tables to develop a total service area population to be consistent with the other tables in this section.

Summary

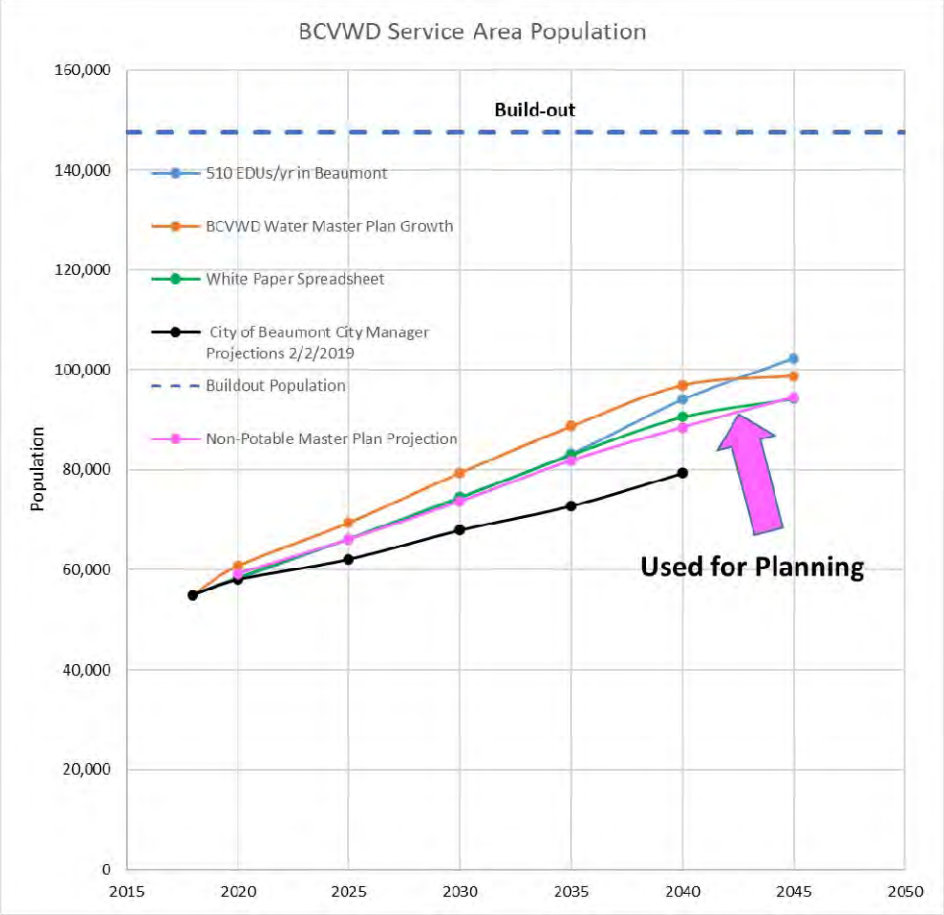
Figure 3-5 shows the total BCVWD service area population under the four scenarios presented above. Also included, for comparison, is the population projection from BCVWD's 2015 Potable Water Master Plan, which is the most aggressive. The City Spreadsheet shows the slowest growth. This is not surprising since this was prepared for budgeting and strategy purposes. The White Paper Spreadsheet Model closely follows the WWTP Feasibility Study projection using 510 EDUs/yr for Beaumont development. The deviation in 2035 is a result of increased development in Cherry Valley.

Of the growth projections in Figure 3-5, from 2018 to 2040, the growth in the 2015 BCVWD Potable Water Master Plan is the most aggressive. The growth rate projected by the City of Beaumont City Manager for budgetary purposes is the lowest growth rate. BCVWD's White Paper Spreadsheet Model is midway between the highest and lowest rates, and represents a reasonable rate for planning purposes. It closely parallels the growth rate in the City's Wastewater Facilities Plan until 2035 (510 EDUs/year).

Table 3-9
Projected EDUs and Population in BCVWD Service Area City Spreadsheet Data
(Baseline 2018)

	2018	2020	2025	2030	2035	2040
Cumulative New EDU's in Beaumont	0	943	2,108	3,753	4,918	6,003
Cumulative New EDUs, Cherry Valley	0	13	82	251	552	1,661
Total New EDUs in BCVWD Service Area	0	956	2,190	4,004	5,470	7,664
People/EDU in Beaumont	3.12	3.2	3.3	3.3	3.35	3.35
Beaumont Population	48,237	51,225	55,193	60,622	64,369	64,712
People/EDU in Cherry Valley	2.43	2.43	2.43	2.46	2.50	2.60
Cherry Valley Population	6,738	6,770	6,937	7,355	8,118	11,057
Total BCVWD Service Area Population	54,975	58,024	62,131	67,977	72,830	79,404

Figure 3-5
Total BCVWD Service Area Population Under Various Development Scenarios



Comparison with Division of Finance Projections

Table 3-10 shows State of California Division of Finance (DoF) population growth rate for Riverside County. The growth rate for Riverside County, as a whole, is 4.2% per year (geometric) from 2020-2045 – about half that projected for BCVWD for the same period (9.8%). This is to be expected as the growth rate for the BCVWD area is expected to be significantly greater than Riverside County as a whole.

Table 3-10

DoF Riverside County Population Growth Rates

	Population					
	2020	**2025**	**2030**	**2035**	**2040**	**2045**
CA Dept. of Finance Projection - Riverside County (x1,000 People)	2,449	2,594	2,728	2,841	2,933	3,005
5-Year % Change	-	5.90%	5.17%	4.13%	3.24%	2.45%
BCVWD	59,258	66,149	73,739	81,906	88,532	94,556
5-Year % Change	-	11.63%	11.47%	11.08%	8.09%	6.80%

Section 4

Non-Potable Water Sources

Existing and potential water sources for BCVWD's non-potable water system include:

- Potable groundwater (currently supplementing the 2800 Non-potable Zone and exclusively supplying the 2600 Zone and lower Non-potable Zones)
- Non-potable groundwater from Well 26 (currently the major supply source for the 2800 Non-potable Zone)
- Recycled water
- Screened imported SPW
- San Timoteo Canyon Groundwater
- High nitrate groundwater from mouth of Edgar Canyon

These sources, facilities, and quantities are discussed in this section.

Water Resource Recycling Facilities

There are three potential sources of recycled water for BCVWD's non-potable water system:

- City of Beaumont Treatment Plant No.1
- YVWD Henry Wochholz Regional Water Recycling Facility (WRWRF) through YVWD's non-potable water system
- City of Banning Treatment Plant (long range source)

The City of Banning and YVWD are listed; however, these are not considered sources at this time.

City of Beaumont

The City of Beaumont provides wastewater collection and treatment to the residents and businesses in the City of Beaumont and the Highland Springs Village area of Cherry Valley. About 52,000 people currently (2020) live in Beaumont and most are served by the wastewater collection system. There are about 148 parcels, out of about 13,000 parcels in Beaumont, on septic tank systems[6]. The wastewater flows generally by gravity to the City's Treatment Plant

[6] City of Beaumont City Manager, Potential Grant for Conversion of Septic Systems on 6th St/Maple Ave., Staff Report, January 20, 2015.

No. 1 located west of Viele Avenue and south of 4th Street. The collection system does include ten (10) lift and pumping stations, however.

The existing City of Beaumont's Treatment Plant No. 1 (to the right) has a design and current design capacity of 4 million gallons/day (mgd). The newly upgraded treatment facility provides influent screening, solids digestion through anaerobic, anoxic, and aeration basins, membrane bioreactor filtration, reverse osmosis filtration, brine disposal, travelling bridge, and low pressure-low intensity UV disinfection (Trojan UV 3000). The brine waste from the reverse osmosis system is discharged to the Inland Empire Brine Line (IEBL). The disinfected effluent flows down a cascade aerator channel into Cooper's Creek. Two (2) repurposed clarifiers have been converted to provide extra storage and flow equalization for recycled water, to be distributed to BCVWD. Each recycled water storage tank has a volume of 0.5 MG.

Waste biosolids, which are essentially aerobically digested in the Biolac® basins, are pumped to a gravity thickener; the thickened, waste biosolids are dewatered using centrifuges, discharged to a truck, and hauled offsite to a composting facility for recycling[7].

The treatment facility operates under Order No. R8-2015-0026 and NPDES No. CA0105376 adopted July 24, 2015. The permit is due to expire on July 31, 2020. The current (2021) average daily flow is 3.70 mgd.[8] The waste discharge order permits surface discharge at two locations:

- Cooper's Creek, where it has been discharging since the plant was originally built in the 1920s, (DP-001)
- An unnamed tributary of Marshall Creek, (DP-007). This has not been used since September 2015.[9]

There are three permitted locations for reclamation and reuse:

[7] Title 22 Engineering Report (2016). City of Beaumont Wastewater Treatment Plant, prepared for the City of Beaumont by AQUA Engineering/Albert A. Webb and Associates, July.

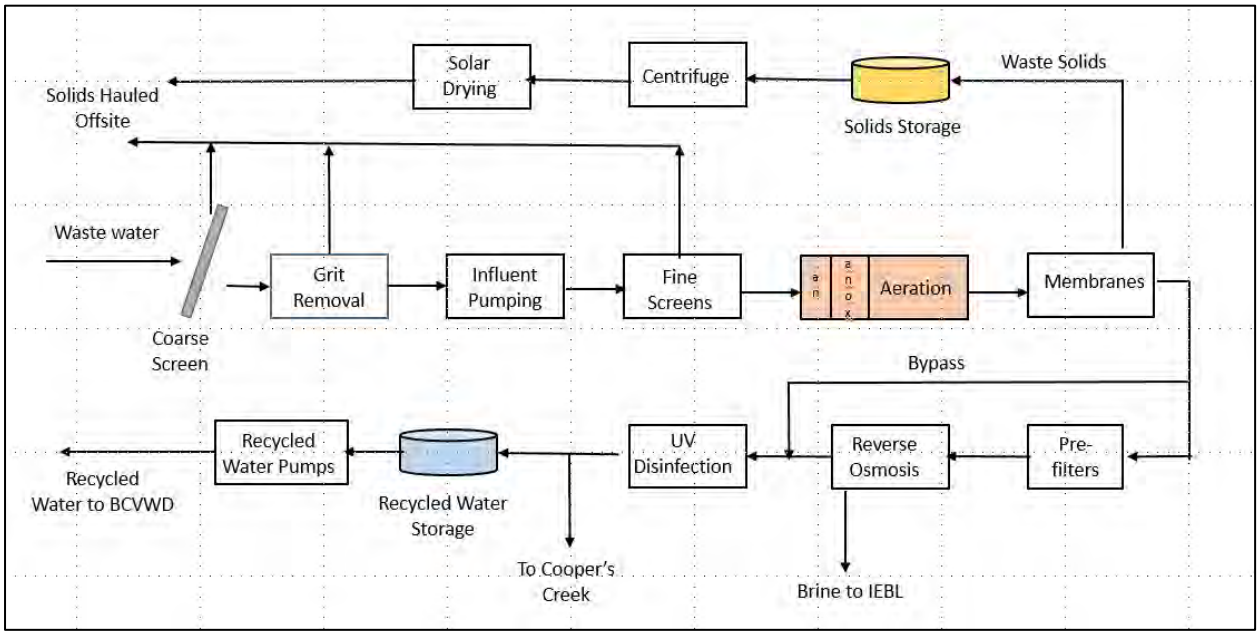
[8] Beaumont Basin Watermaster (2019). 2018 Consolidated Annual Report and Engineering Report Draft, prepared by Alda Inc, in association with Thomas Harder and Company, February.

[9] Ibid.

- Tukwet Canyon Golf Course (R-001)
- Oak Valley Golf Course (R-002)
- BCVWD (R-003)

Figure 4-1 shows a simplified block process flow diagram for the upgraded and expanded treatment facility. Raw wastewater enters the plant through several large diameter sewers and passes through mechanically cleaned coarse bar screens then on to gravity, vortex grit removal. The screened and degritted wastewater flows into a refurbished influent wastewater pumping station where the flow is lifted to flow through fine screens and then into the secondary biological treatment process. The process is configured with an anaerobic zone, an anoxic zone and an aeration (nitrification) zone. The anaerobic zone functions as a biological selector with enhanced phosphorus removal; the anoxic zone provides nitrogen removal. Compressed air is provided to the aeration tank to provide oxygen to the microorganisms stabilizing the wastewater. The liquid in the aeration tank (termed “mixed liquor”) flows to another lift station where it is pumped to open tanks containing ultrafiltration membranes. The new facility uses the membrane bioreactor (MBR) process.

Figure 4-1
City of Beaumont Upgraded and Expanded WWTP
Simplified Process Flow Diagram



Pumps pull the stabilized liquid through the membranes producing a very clear product water, called permeate. The microbial solids remain behind and are recirculated back to the anoxic tank and then to the anaerobic tank. Biological solids are produced in the process of removing the biodegradable organics in the wastewater and the solids must be systematically “wasted” to the solids handling process.

A portion of the permeate, (up to 2.4 mgd), passes through pre-filters and then through the reverse osmosis process to remove dissolved minerals and other trace organics that escape secondary treatment. This is necessary to meet the Maximum Benefit Salinity Water Quality Objective set by the RWQCB for the Beaumont Management Zone (Beaumont Basin). The reverse osmosis process produces reject water (contains the minerals that are removed from the water) that is discharged to the new brine line leading to the IEBL for eventual treatment and disposal in Orange County.

As stated above, there are solids that are produced as part of the treatment process. Coarse and fine screenings and grit will be collected and hauled offsite for disposal in an approved landfill. Biosolids from the secondary process will be pumped to on-site tanks where the solids will be further stabilized, then dewatered using centrifuges. The centrifuged sludge will be placed on solar drying beds; the dried biosolids will be hauled off-site where they can be composted and beneficially reused.

The product water from the reverse osmosis process blends with the by-passed MBR permeate and passes through the UV disinfection system, and into the reuse splitter structure. The reuse splitter structure contains transfer pumps which transfer effluent to the recycled water storage facilities (repurposed clarifier). Treated water which is not recycled is discharged down the existing cascade aerator channel to Cooper's Creek. As part of the environmental permitting[10] for the recycled water system, the US Fish and Wildlife Service required that a minimum of 1.8 mgd of treated effluent continue to be discharged to Cooper's Creek for maintenance of habitat for threatened or endangered species[11]. Effluent flow in excess of 1.8 mgd can be recycled.

Recycled water storage is necessary on-site to accommodate variations in the wastewater flow rates throughout the day and to facilitate time of use (TOU) pumping. Providing storage allows recycled water to be pumped a consistent rate while avoiding pumping during the peak power demand time. The City of Beaumont intends on using the existing secondary clarifiers, which provide about 1 million gallons of storage for the on-site recycled water storage.

Recycled water will be delivered to BCVWD from the on-site recycled water storage facilities. The details of the pipelines and transfer pumps are being discussed at the present time. BCVWD will be constructing a recycled water pumping station adjacent to the City's WWTP. The discharge from the booster station will be pumped to an existing 24", 2800 Non-potable Water Pressure Zone pipeline in 4th Street.

[10] Initial Study/Mitigated Negative Declaration Beaumont Cherry Valley Water District Recycled Water System Project, SCH 2007081127, June 2007.

[11] Letter dated February 29, 2008, Karen Goebel USFWS to Michelle Jones SWRCB, Informal Consultation for Beaumont Cherry Valley Water District Recycled Water System, SRF Loan C-06-5157-110.

Wastewater Flow

Figure 4-2 shows the recent historic wastewater flow measured at the City of Beaumont's WWTP.[12][13][14][15][16] There is some wet weather impact on the daily flow. The permitted capacity of the WWTP is 4.0 mgd.

Total population in 2015 in Beaumont was 43,370 as reported in Section 3, Table 3-1; the average annual wastewater flow in 2015 was 2.92 mgd. The per capita wastewater flow was 67 gallons per person per day (gpcd) at that time. This per capita flow rate also includes the associated commercial, industrial, and institutional (CII) component and is not just the residential flow. This per capita is relatively low and likely may include the effects of water conservation during the drought that year.

Wastewater flow rate is increasing at about 100,000 gallons per year based on data from Figure 4-2 for the years 2010 to 2019 (note, per capita use decreased from 2011 – 2012, as well as 2013 – 2016; 100,000 gallons/year increase based on net average from 2010 - 2019). In 2019 the flow was reported to be 3.66 mgd (based on City's Draft Wastewater Master Plan Presentation); at 0.10 mgd/year increase, the wastewater flow in 2020 would be projected to be 3.79 mgd which may be more reflective of typical conditions rather than "drought" conditions. The per capita flow rate, based on the 2020 population of 51,647 (2020 UWMP planning estimate), is estimated to be 73 gpcd. This has been trending downward as newer homes, with more efficient plumbing and water using appliances are being constructed and occupied. (Data prior to year 2000 indicated per capita wastewater flows were in the range of 102 to 108 gpcd.) For the purposes of determining the amount of recycled water generated by the City, a per capita flow of 70 gpcd was used as a baseline for 2020. This is discussed further in this Section.

[12] City of Beaumont (2016). Title 22 Engineering Report, Beaumont California Wastewater Treatment Plant, prepared by AQUA Engineering and Albert A. Webb and Associates, July.

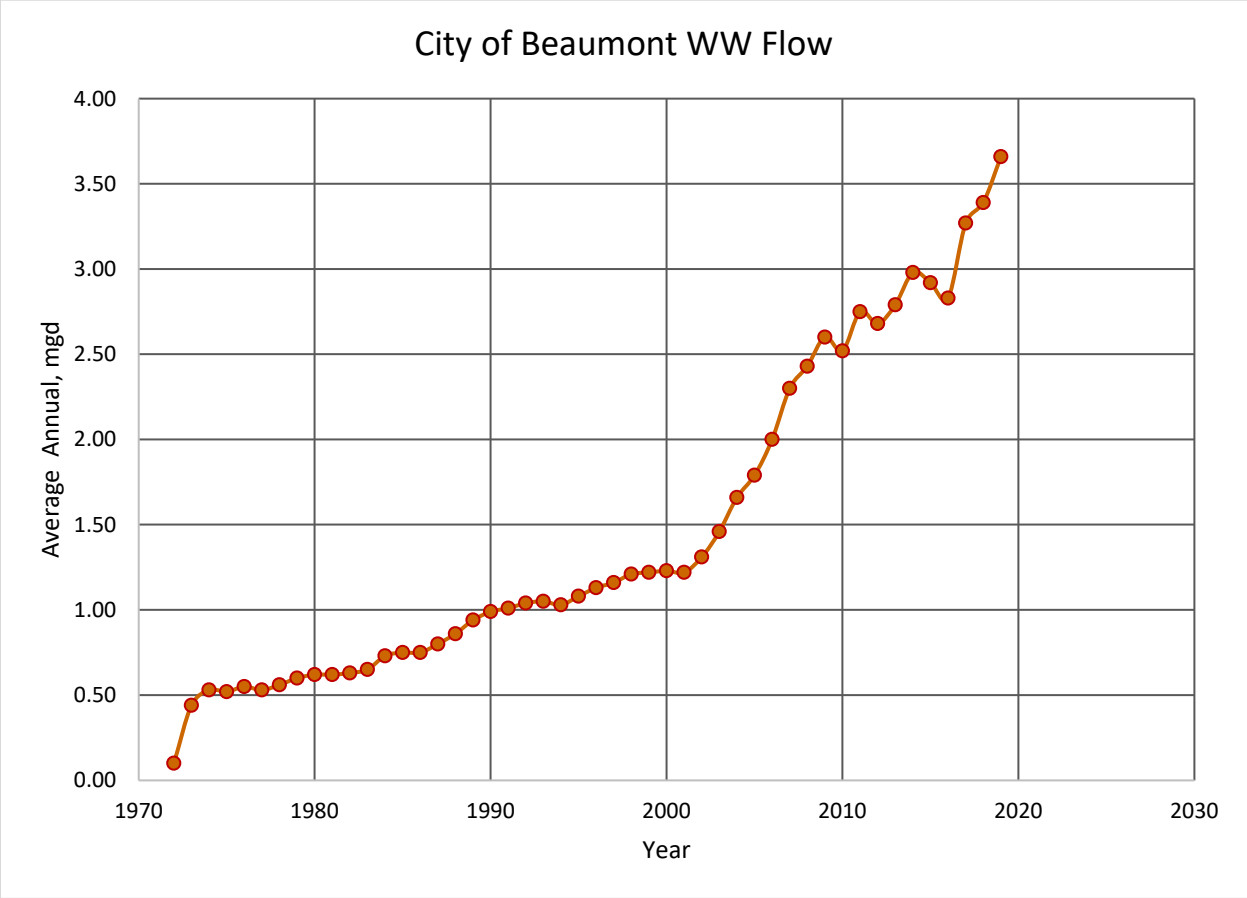
[13] City of Beaumont Staff Report (2016). Director of Public Works/City Engineer to Mayor and City Council, Agenda Item 8i, May 17.

[14] Wildermuth Environmental (2009). City of Beaumont, Attachment A to the Environmental Information Form Accompanying the Petition for Change, April 14.

[15] City of Beaumont (2016). Feasibility Study for WWTP Expansion and Salt Mitigation, prepared by Albert A. Webb Associates and Aqua Engineering, December.

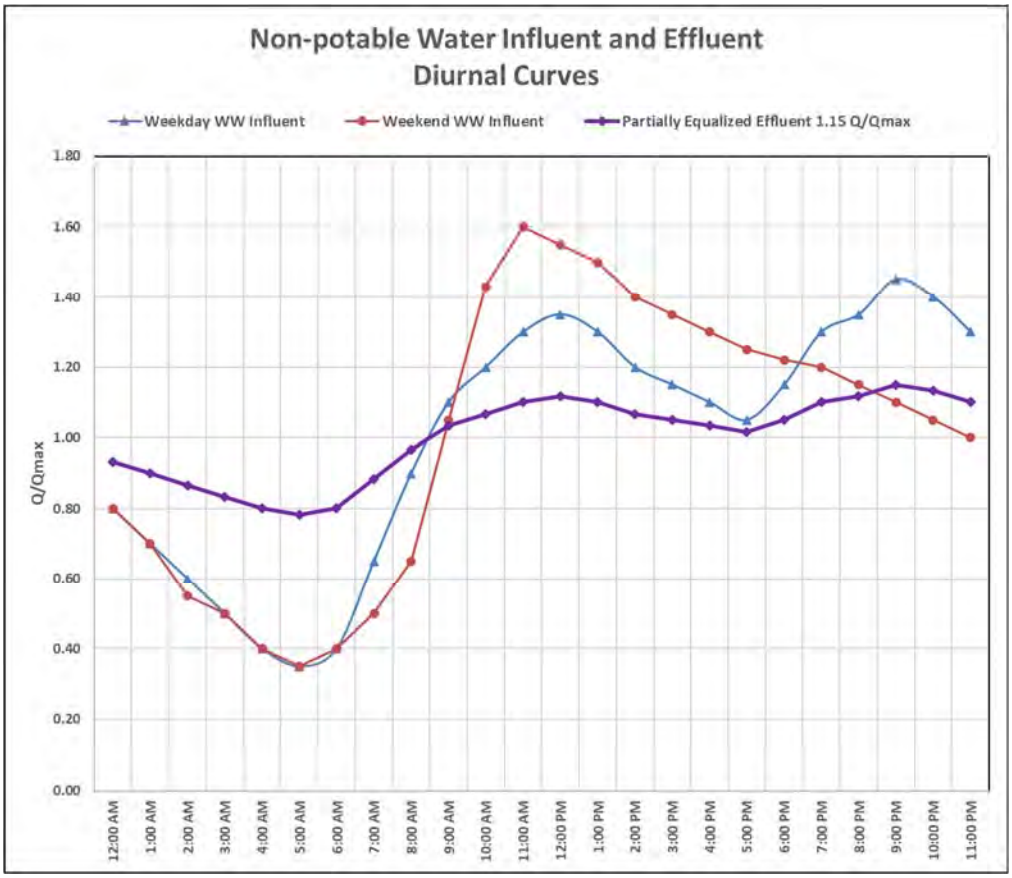
[16] City of Beaumont (2021). City of Beaumont City Council Workshop, July 22, 2021. Presentation of Draft Wastewater Master Plan, prepared by AKEL Engineering Group, Inc., June 22, 2021.

Figure 4-2
Historic Wastewater Flow at City of Beaumont Wastewater Treatment Plant



Influent continuous flow recording data for May 16, 2015 (Saturday) and July 7, 2015 (Tuesday), taken from the City's Title 22 Report, were used to develop an hourly flow pattern (diurnal curve) for the influent flow to the treatment facility. The data is plotted in Figure 4-3 as a ratio of the hourly influent flow to the average for the day. A smoothed curve was developed and is shown.

Figure 4-3
City of Beaumont Typical Influent and Partially Equalized Effluent Flow



The new wastewater treatment facility uses a membrane bioreactor system, MBR, and the City has provided a flow equalization system upstream of the MBR process. The capacity of the flow equalization basin is 1.5 million gallons or 25% of the average flow at design capacity (40% of current average flow). Based on experience, this volume would provide nearly complete equalization throughout the day. To allow for control system fluctuations, variable inflow from day to day, and wet weather flows, a 1.15 peaking factor has been used to evaluate storage requirements at the treatment facility and in the non-potable water distribution system. The partially equalized flow generally follows the diurnal curve pattern is also shown in Figure 4-4.

Table 4-1 shows the design flow rates for the MBR wastewater treatment facility which was recently completed.

Table 4-1
City of Beaumont New MBR WWTP Influent Design Criteria[19]

Design Parameter	Criteria
Design Flow	6.0 mgd
Peak Hourly Flow	13.20 mgd
BOD	400 mg/L
TSS	300 mg/L
TKN	50 mg/L
Future Average Flow	8.0 mgd

Effluent Quality

The average quality of the City's WWTP influent and effluent is shown in Table 4-2. The TDS of the effluent is 408 mg/L which is very good quality for recycled water. The TDS of BCVWD's water supply is about 250 mg/L, so the increment from "use" is about 158 mg/L, which is relatively low.

There is only one significant industrial discharger to the wastewater system – Pericone Farms Juice Plant which generates about 0.122 mgd of wastewater flow[20].

[19] Feasibility Study for WWTP Expansion and Salt Mitigation, prepared by Albert A. Webb Associates and Aqua Engineering, December 2016,

[20] City of Beaumont (2016). Title 22 Engineering Report, Beaumont California Wastewater Treatment Plant, prepared by AQUA Engineering and Albert A. Webb and Associates, July.

Table 4-2
City of Beaumont WWTP Influent and Effluent Characteristics - 2014[22]

		2014				2014	
Constituent	**Units**	**Influent**	**Effluent**	**Constituent**	**Units**	**Influent**	**Effluent**
BOD	mg/L	298	15	Cadmium	µg/L	ND	ND
COD	mg/L	624	12.2	Chromium	µg/L	12	ND
TSS	mg/L	205	ND	Cobalt	µg/L	N/A	ND
NH4	mg/L	40	1.7	Copper	µg/L	59.3	ND
TIN	mg/L	40	3.32	Cyanide	mg/L	ND	ND
TDS	mg/L	524	408	Lead	µg/L	ND	ND
Sodium	mg/L	80	74	Mercury	µg/L	ND	ND
Chloride	mg/L	68.8	68	Nickel	µg/L	ND	ND
Sulfate	mg/L	23	32	Phenolic	µg/L	N/A	0.03
Hardness	mg/L	203	171.4	Selenium	µg/L	ND	ND
Boron	mg/L	0.25	0.21	Silver	µg/L	ND	ND
Fluoride	mg/L	0.1	0.42	Thallium	µg/L	N/A	ND
Iron	µg/L	N/A	ND	Zinc	µg/L	132.5	58
Manganese	µg/L	24.3	ND	Chloroform	µg/L	N/A	1.4
Arsenic	µg/L	ND	ND	Coliform	col/100 mL	N/A	2
ND = Not Detected; N/A = Not Analyzed							

Table 4-3 shows the effluent water quality for the MBR wastewater treatment facility now under construction.

Table 4-3
City of Beaumont New MBR WWTP Effluent Design Criteria[23]

Parameter	Permit Limits
Average Daily Flow	6.0 mgd
Peak Hourly Flow	11.25 mgd
BOD	<20mg/L
TSS	<20 mg/L
TIN	<2mg/L
Ammonia-N	<4.5 mg/L
Turbidity	<2 NTU
TDS	<330 mgL
Total Coliform	< 2.2 MPN/100 mL

[22] Title 22 Engineering Report (2016). City of Beaumont Wastewater Treatment Plant, prepared for the City of Beaumont by AQUA Engineering/Albert A. Webb and Associates, July.

[23] Ibid.

Recycled Water Available from the City of Beaumont

Wastewater flow is projected to grow as the population increases. Table 4-4 presents the wastewater flow and recycled water flow available from the City of Beaumont's Treatment Plant. Table 3-8, presented previously in Section 3, showed the population forecast for the City of Beaumont; these values are used in the projections in Table 4-4.

Table 4-4
Recycled Water Available from City of Beaumont's WWTP

Year	2020	2025	2030	2035	2040	2045	Build-out
City of Beaumont Population	51,647	58,467	65,901	73,901	80,335	86,266	134,000
Wastewater Generation Flow Rate, gpcd	70	67.5	65	65	62	60	60
Wastewater Flow, mgd	3.62	3.95	4.28	4.80	4.98	5.18	8.04
Environmental Mitigation Flow, mgd	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Wastewater Available for Recycling, mgd	1.82	2.15	2.48	3.00	3.18	3.38	6.24
Estimated amount which can be recycled (10% loss), mgd	1.45	1.75	2.06	2.52	2.68	2.86	5.44
Recycled Water Available, gpm	-	1,220	1,430	1,760	1,870	1,990	3,780
Recycled Water Available, gpm (19 hr of pumping)	-	1,540	1,810	2,220	2,360	2,510	4,770
Recycled Water Available, AFY	-	1,963	2,302	2,827	3,005	3,202	6,090
Recycled Water Available, AF/month	-	164	192	236	250	267	508

Table 4-4 above shows the recycled water produced, the recycled water that must be reserved for habitat mitigation (1.8 mgd), and the net amount of recycled water available for recycling. Not all of the recycled water available can be recycled and used by BCVWD. The estimated amount which can be recycled is reduced by 1) the amount of recycled water used on site for wash down and irrigation and water contained in the waste biosolids which are hauled offsite; and 2) the reject water from reverse osmosis process facility to meet the TDS limit of 330 mg/L for recycled water discharged to the brine line.

As discussed previously in Section 3, buildout may not occur until well after 2045, and the projected buildout population may change as land use designations and City-desired population densities change. Changes in the projected buildout population would affect the anticipated amount of recycled water available at buildout.

A mass balance calculation was made based on an influent wastewater TDS of 450 mg/L, a reverse osmosis (RO) product water TDS of 50 mg/L, and the blended recycled water TDS requirement of 330 mg/L. The calculations indicated that about 33% of the wastewater will need to be treated in the RO process (about 2.0 mgd). At 80% recovery, typical of RO processes

treating this quality of water, 7% of the total wastewater flow will be reject water or “brine.” The total deduction for brine and on-site uses and water in hauled biosolids is rounded to 10%.

Recent legislation signed by the Governor (AB 1668/SB 606) establishes 55 gpcd as the standard for indoor residential water use (effective immediately). Beginning January 1, 2025, the indoor residential water use standard will drop to 52.5 gpcd and could drop further to 50 gpcd by January 1, 2030. A rough analysis by BCVWD staff, based on water consumption in BCVWD’s 2020 Urban Water Management Plan (UWMP), indicates the Commercial, Industrial, and Institutional (CII) portions of BCVWD’s potable water demand is about 21 gpcd (2020). Since a very large portion of the CII potable water turns into wastewater, the per capita wastewater flow in Beaumont, including CII, should be 70 gpcd effective immediately (73 gpcd estimated for 2020), reducing to 67.5 gpcd by January 1, 2025, and then possibly even to about 65 gpcd by January 1, 2030 and beyond. Table 4-4 reflects a continued decrease in per capita flow to buildout.

Potential Impact of Sewers in Cherry Valley

At the present time, except for Highland Springs Village, Cherry Valley is unsewered and on septic tanks. Currently about 0.5 mgd of wastewater is generated in Cherry Valley and this volume of wastewater is estimated to remain around 0.5 mgd to 2045 (estimated using population projections for Cherry Valley and wastewater generation of 60 gpcd).

Riverside County Ordinance 871, prohibits new septic tanks in the Cherry Valley Community of Interest (CVCOI or Cherry Valley COI) unless the on-site system can be demonstrated to remove at least 50% of the nitrogen. Typically, this will require an add on nitrification/denitrification system. The ordinance does not affect existing septic tanks that are to be replaced or repaired unless they are to be expanded to accommodate new construction or additional fixtures.

The CVCOI is the area generally north of Brookside Ave. between Bellflower Street and Nancy Street, and includes the Cherry Oaks and Bonita Vista Areas. BCVWD prepared a Facilities Plan to provide wastewater collection and treatment for the CVCOI in 2007. The Facilities Plan was to support an application for an SRF loan/grant. Providing sewers would minimize the nitrate contribution to the Beaumont Groundwater Basin and provide a source of recycled water which could be beneficially used. Unless another agency is formed, like a County Services District or other similar public agency, BCVWD would likely be the agency operating the collection system and treating the wastewater in either a separate treatment plant or through a contract with the City of Beaumont or other agency for treatment.

Although BCVWD has the power to provide wastewater collection and treatment under the Irrigation District Act which it was formed, this power was never exercised, and LAFCO required a vote of the District residents to exercise the power. The ballot measure, Measure B, was defeated in September 2007 and, as a result, BCVWD does not currently have sewering

authority in Cherry Valley. So, if CVCOI is to be sewered in the future, voter approval will be necessary.

It is unlikely that Cherry Valley will have a wastewater collection system within the next 20 years, therefore should not be considered as being a source of recycled water, at least until 2035 or 2040, and is not included in the recycled water availability calculations. Future master plans may reconsider it.

Supplemental Supply

Imported Water Supply

In the past, potable groundwater has supplied the non-potable water system. A portion of the system, (2800 Non-potable Pressure Zone) has been primarily supplied by BCVWD's Well 26, which has the capability to pump to either the Potable 2850 Pressure Zone or the non-potable 2800 Pressure Zone. The other pressure zones (2600 and 2400 Non-potable Pressure Zone) remain connected to the potable water system through temporary interconnections.

BCVWD has identified a project (NM-2800-001) in the February 2018 Ten-year Capital Improvement Program, to install equipment to screen imported SPW and introduce the raw screened water into the 2800 Zone Non-potable Water Tank to supplement the recycled water to meet demands during peak demand months as needed as an alternative to non-potable groundwater. This will have the benefit of saving pumping energy and cost. Once this project is completed, imported SPW could be the primary supplemental water supply for the non-potable water system; non-potable groundwater and potable groundwater will serve as a backup when additional water supply is needed to supplement the recycled water from the City of Beaumont.

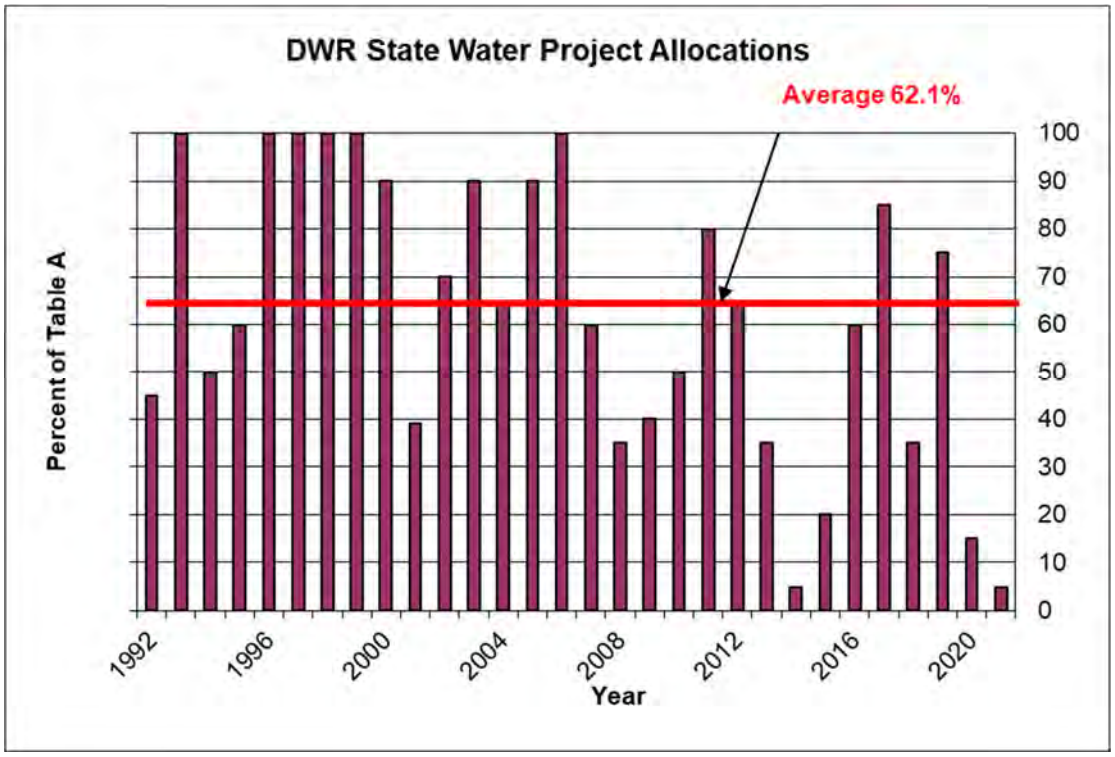
The SGPWA is the State Water Contractor responsible for importing State Project Water (SPW) into its service area in the San Gorgonio Pass through the East Branch Extension (EBX) of the State Water Project. A detailed discussion on the imported water facilities and EBX I and II are included in the 2020 BCVWD Urban Water Management Plan.

BCVWD takes water from a 20-in diameter turnout and metering station at the current end of EBX I at Orchard Ave. and Noble Creek in Cherry Valley. Water from Pass Agency's EBX turnout is metered by DWR. The turnout was expanded in 2019 and has a metering capacity of 34 cfs. The metered flow then enters BCVWD's 3,500-ft long, 24-in diameter pipeline which conveys the water to BCVWD's groundwater recharge site located east of Beaumont Ave., between Brookside Ave and Cherry Valley Blvd. The pipeline, designed for 30 cfs, was constructed by BCVWD in 2006 but can easily accommodate 34 cfs. If operated continuously at

34 cfs, the pipeline could convey 24,570 acre-ft per year. The velocity in the pipeline at 34 cfs is 10.8 ft/second.[24]

The SGPWA has a current Table A (100%) contract of 17,300 AFY. However due to delivery reliability issues with the State Water Project (SWP), on the average, the DWR has determined that the SWP will only be able to deliver about 56% of the Table A amount.[25] Figure 4-4 shows the historical allocations from 1992 through 2021. The average for the period is 62.1%, very close to DWR's estimated long term average of 56%.

Figure 4-4
Historical SWP Allocations



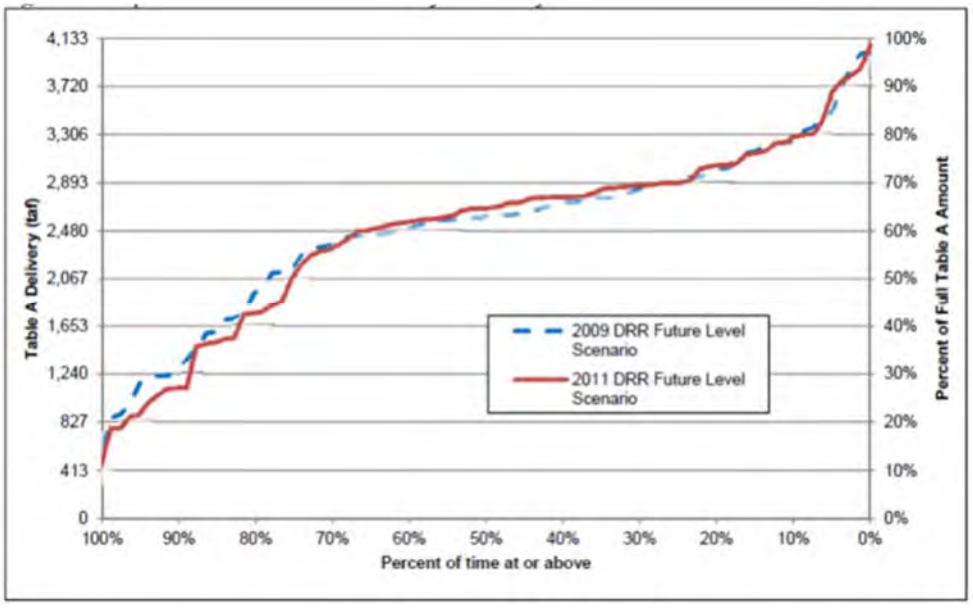
The SWP delivery reliability was calculated by DWR using the Cal-Sim-II computer model which simulates current and future operations of the SWP. The analyses were based on 82 years (1922-2003) of rainfall and runoff adjusted to reflect current and future levels of development. The impact of climate change was factored into the calculations. Figure 4-5 presents a

[24] The Ductile Pipe Research Association (DIPRA) states that 14 ft/second is a normal conservative maximum velocity for continuous service in most applications. https://www.dipra.org/ductile-iron-pipe-resources/frequently-asked-questions/hydraulics, accessed 12/11/2019

[25] State Water Project Draft Delivery Reliability Report 2021 (2021). Department of Water Resources, (December)

cumulative probability curve of deliveries as a percent of a Contractor's Table A amount. The results are summarized in Table 4-5.

Figure 4-5
SWP Delivery Reliability (2011 data, based on Future Conditions)



Source: 2011 Final Delivery Reliability Report, Technical Addendum

In reading Table 4-5, 90 percent of the time the SWP will be able to deliver 28 percent of a Contractor's Table A; 50 percent of the time, the SWP will be able to deliver 64 percent of Table A. The delivery reliability is projected to decrease from 62 to 64% to 48% or lower over the coming decades if the Delta Conveyance project is not implemented.[28] This is consistent with the findings of DWR's 2021 Delivery Capability Report (DCR), which indicates that on average only 56% of Table A water will be available (discussed above).

[28] The Brattle Group (2018). Economic Analysis of the California Water Fix, Benefits and Cost to Project Participants, prepared for California Department of Water Resources, David L. Sundling, Ph.D.

Table 4-5
Percent Probability of Receiving Full Table A Amount (2011)

Probability Expressed as a % of Time	Percent of Table A
90	28
80	42
70	56
60	61
50	64
40	66
30	69
20	73
10	78

Source: Extracted from 2011 Final Delivery Reliability Report Technical Addendum

Presented below in Table 4-6 is a similar analysis for 2020 data, provided in the 2020 UWMP. In reading Table 4-6, 92% of the time, the SWP will be able to deliver at least 25% of the total Table A amount; 11% of the time, the SWP will be able to deliver at least 87% of the total Table A amount. Note, the long-term average of 58% Table A Allocation reflected in Table 4-6 is greater than the updated long-term projection in the 2021 DCR (56%). The data in Table 4-6 has been provided for consistency with the 2020 UWMP.

Table 4-6
Percent Probability of Receiving Full Table A Amount (2020)

Probabilty Expressed as % Likelihood of Annual Delivery Greater Than	Percent of Total Table A
100	0
98	12
92	25
83	37
72	50
50	58
27	75
11	87
1	99.8

Source: Extracted from 2020 Final Delivery Capability Report

The SGPWA imported water deliveries to BCVWD are presented in Table 4-7. BCVWD's delivery ranged from just under 2,400 AF in 2008 (35% allocation) to 13,645 AF in 2019 (75% allocation). For the eighteen-year period shown in Table 4-7, BCVWD imported water need averaged 81% of the total SGPWA deliveries. Over the period, BCVWD imported 6,960 AFY on the average.

Table 4-7
Historical Deliveries of SPW to SGPWA and BCVWD

Calendar Year	Total SGPWA Deliveries, acre-ft (1)	BCVWD Deliveries, acre-ft (2)	BCVWD % of SGPWA Deliveries	DWR Allocation %
2003	116			90
2004	814			9065
2005	687			90
2006	4,279	3,501	81.8	100
2007	5042	4,501	89.3	60
2008	4,980	2,399	48.2	35
2009	6,306	2,741	43.5	40
2010	8,287	5,727	69.1	50
2011	10,621	7,979	75.1	80
2012	10,810	7,783	72.0	65
2013	9,485	7,403	78.0	35
2014	5,030	4,405	87.6	5
2015	3,476	2,773	79.8	20
2016	10,814	9,319	86.2	60
2017	14,940	13,590	93.8	85
2018	12,621	12,121	96.0	35
2019	14,152	13,645	96.4	75
2020	11,469	11,005	96.0	15
2021	2,504	2,468	98.6	5
Total		111,360		

Sources: 2021 Watermaster Annual Report,

SGPWA Commitment to Meet BCVWD Imported Water Needs

On February 18, 2014, the Board of Directors of the SGPWA adopted Resolution No. 2014-02, A Resolution of the San Gorgonio Pass Water Agency Establishing a Policy for Meeting Future Water Demands. Section 3(a) of this resolution states:

> *"The Agency is prepared to take the necessary actions to provide its service area with adequate supplies of water to meet expanding and increasing needs in the years ahead. As additional water resources are required to meet increasing needs, the Agency will be prepared to take the necessary actions to deliver such supplies."*

BCVWD needs SPW whether recharged and/or treated and used for potable supply or used directly in the non-potable water system.

The SGPWA considers the current allocation of the Agency's Table A amount of 17,300 AFY to be fully subscribed by the current users which are BCVWD, YVWD, South Mesa Water Company (SMWC), and the City of Banning.

BCVWD will need additional imported water to meet its long-term potable water and possibly non-potable water needs, even when maximizing local water resources. In 2017 and 2018, BCVWD prepared a series of White Papers to identify the regional water supply requirements of the agencies supplied by SGPWA. These White Papers demonstrated the need for SGPWA to secure additional Table A resources and commit to participation in the Delta Conveyance (formerly called the California Water Fix) and Sites Reservoir. BCVWD has funded initial phases of Sites Reservoir up to 4,000 AF.

The SGPWA has secured an agreement with Antelope Valley East Kern (AVEK) Water Agency for 1,700 AFY of "Nickel Water," short-term purchases of SPW from the City Ventura/Casitas MWD until such time as Ventura/Casitas can take SPW. This along with banked water by BCVWD, Banning, SMWC, and YVWD should buy enough time for the Delta Conveyance and Sites Reservoir projects to be implemented (about 2035).

Imported Water Quality

Figure 1-3 presented in Section 1 showed the variability in the SPW TDS over time. The TDS is quite variable depending on hydrologic conditions in the Delta. Dry years have higher TDS than wet years as there is insufficient flow to flush out and reduce the Bay water intrusion and entrainment in the water flowing to Clifton Court Forebay and the Banks Pumping Plant. Some of the "Delta Conveyance," e.g., the "tunnel," if constructed, should reduce the salinity intrusion and stabilize the TDS.

Imported Water Capacity

Imported water is not available every day. There are times when imported water is not available, e.g., droughts, reduced allocation, emergency or scheduled aqueduct or pipeline maintenance. The SGPWA turnout and metering station from EBX is 20-in diameter which has a capacity of 34 cfs, 67.3 AF/day, 2,050 AF/month, or over 24,500 AFY if operated continuously. The BCVWD 2020 UWMP water supply analysis indicated that BCVWD would need approximately 11,281 AFY of imported water by 2045; and an additional 4,769 AFY for "drought proofing" or other miscellaneous uses. The total anticipated imported water needed by 2045 is about 16,050 which is less than the capacity of the turnout and BCVWD's 24-in diameter pipeline.

Groundwater

Well 26 (Existing Source)

Well 26, located just east of Cherry Avenue at 11th Street, near the Anna Hause Elementary School, had concentrations of hexavalent chromium (CrVI) of 14 µg/L exceeding the California MCL of 10 µg/L which took effect July 1, 2014 with monitoring required by January 1, 2015. Since BCVWD found CrVI above the MCL, Well 26, with a production capacity of 1,650 gpm, (shared equally with Banning), could not be used for potable water supply without treatment to reduce the CrVI to less than 10 µg/L. Since there was significant demand in the non-potable water system, and Well 26 was located in close proximity to a non-potable water transmission main, BCVWD made the decision to connect Well 26 to the non-potable water system. Well 26 has been pumping into the 2800 Non- Potable Pressure Zone since August 2015. (Note the other lower pressure zones are currently supplied with potable water from the 2650 Pressure Zone Hannon Tank. These interconnections will be severed when recycled water is available. New, non-potable water, pressure regulating stations will be installed to serve the 2600 and 2400 Non-potable Pressure Zones from the 2800 Non-potable Pressure Zone.)

Even though the California Superior Court, County of Sacramento, directed the SWRCB to withdraw the 10 ug/L CrVI MCL, Well 26 continues to supply the 2800 Non-potable Pressure Zone, supplemented by potable water as needed.[29]

Once recycled water is available from the City of Beaumont, Well 26 will be used to supplement the non-potable supply until screened SPW is available as described above. When screened SPW is available, Well 26 will supplement the non-potable system in the event SPW is not available.

[29] California Manufacturers and Technology Association, et al. vs. State Water Resources Control Board, Case No. 34-2014-80001850, Superior Court, State of California, County of Sacramento

At some point in the future, when other sources of non-potable water are available and, if a new MCL is established for CrVI, BCVWD may provide well-head treatment for Well 26. It all depends on economics.

In terms of supply, at 1,650 gpm pumping capacity, Well 26 has provided as much as 182 AF per month. When Well 26 is at full capacity, potable water supplement during the peak months is typically less than 50 AF per month. This is expected to decrease as recycled water becomes available.

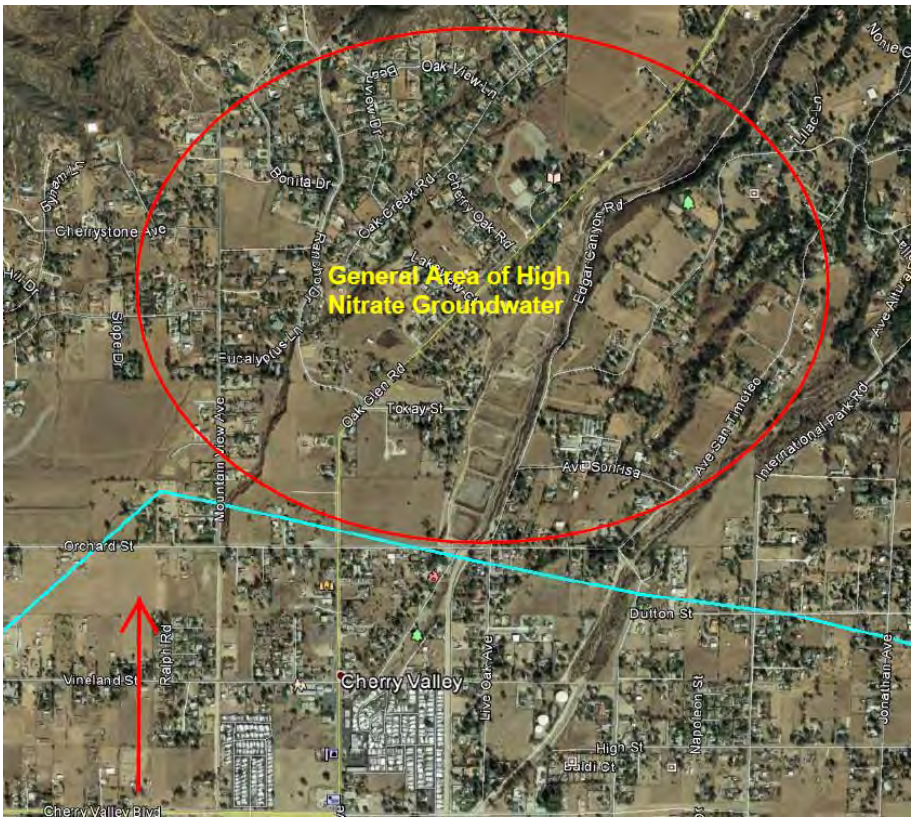
Mouth of Edgar Canyon (Future Source)

High nitrate groundwater occurs in the area at the mouth of Edgar Canyon. This has been documented in a USGS study prepared for the SGPWA[30] among others. See Figure 4-6. This water could be extracted to supplement the non-potable water system. It is outside of the adjudicated boundary of the Beaumont Basin and should be able to be extracted without replacement. The high nitrate groundwater is otherwise not useable as a potable water supply without costly treatment to remove nitrate. Blending high nitrate groundwater into the non-potable water system would provide beneficial nitrogen (fertilizer) to the plant and landscape materials and facilitate remediation of groundwater underlying the mouth of Edgar Canyon. Extracting this poor quality groundwater and allowing the area to recharge with natural infiltration would improve the water quality over time and reduce the inflow of this poor quality water into the Beaumont Basin. BCVWD believes there could be 300 to 500 AFY or more of water available from this source. Hydrologic studies and pump testing would need to be performed to confirm the yield as well as the technical and economic feasibility of the project.

This source of water has been identified in previous BCVWD Capital Improvement Programs and has merit for supplementing the non-potable water system during high demand periods. This is described in more detail in Section 6 which describe non-potable water facility needs.

[30] USGS (2006). Geology, Ground-Water Hydrogeology, Geochemistry, and Ground-Water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California, in cooperation with San Gorgonio Pass Water Agency, by Rewis, D. L. et. al., Scientific Investigations Report 2006-5026.

Figure 4-6
General Location of Area of High Nitrate Groundwater at Mouth of Edgar Canyon
(Beaumont Basin Adjudicated Watermaster Boundary Shown in Blue)



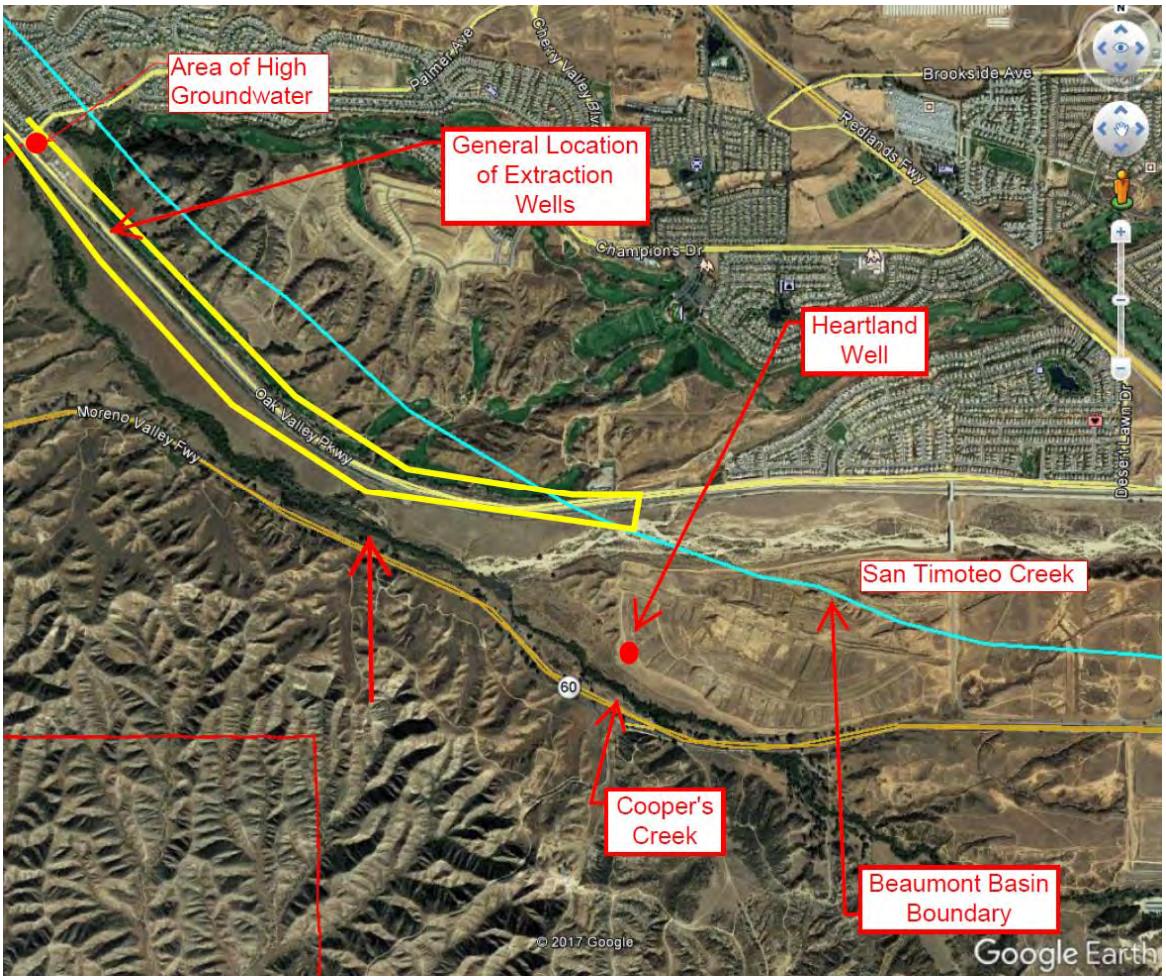
San Timoteo Canyon

A well was drilled for construction water and used in the grading operation of the Heartland project between Highway 60 and San Timoteo Creek, (called “Heartland Well”). Groundwater is shallow in this area, generally 50 ft below ground surface or so. The well was drilled to a depth of about 540 ft. A detailed mineral analysis was performed at four zones from shallow to deep. The deeper zones had TDS concentrations generally below 220 mg/L; the shallowest zone had a TDS concentration just under 500 mg/L and closely approximated the water quality in San Timoteo Creek, i.e., the City of Beaumont’s wastewater quality. The composite production from the well had a TDS concentration of just under 220 mg/L. Pumping was recommended at 200 gpm. The Heartland Well and vicinity is shown in Figure 4-7.

The City of Beaumont’s wastewater discharge is into Cooper’s Creek a tributary of San Timoteo Creek; Cooper’s Creek joins San Timoteo Creek near the Hearland well site. The wastewater effluent percolates, at least partially, in Cooper’s Creek. U.S. Fish and Wildlife requires that the City of Beaumont continue to discharge up to 1.8 mgd to maintain habitat in Coopers Creek, a tributary of San Timoteo Creek. Water, which is not used by the vegetation and phreatophytes along the creek, percolates into the underground. BCVWD believes this water can be recovered through carefully placed extraction wells along San Timoteo Creek. The extracted groundwater

would be introduced into BCVWD's non-potable water system. This project is described in more detail in Section 6.

Figure 4-7
General Location of Heartland Well and Location of San Timoteo Extraction Wells
(Beaumont Basin Watermaster Boundary Shown in Blue)



Since the development of Fairway Canyon and the Tukwet Canyon Golf Course, high groundwater and springs have been observed along San Timoteo Canyon Rd in the vicinity of Palmer Dr., adjacent to San Timoteo Creek. This is likely due to the percolation of landscape irrigation water in the developed areas. The groundwater, estimated by BCVWD to be up to 1,500 AFY, could be extracted and introduced into the non-potable water system to supplement the recycled water during the peak irrigation season and is discussed in more detail in Section 6.

The City of Beaumont drilled a well in Nicklaus Paw Park to monitor groundwater levels in the area. The well is not within the Beaumont Basin and not subject to the adjudication. It may be possible to integrate this well into an extraction well system to supplement the non-potable water system during time of high demands.

Section 5

Non-Potable Water Market and Demands

Background

Construction started on BCVWD's non-potable water system in the early 2000s with the Three Rings Ranch and Oak Valley Greens developments as the first projects to have non-potable water piping serving common areas, street medians, parks, and school sites, etc. The system was fed from the potable water system through interconnections. Figure 5-1a shows the non-potable water use from 2006 through 2021. Average annual use for the period (2006 – 2021) was 1,616 AFY; and for 2010 through 2021, the average annual non-potable water use was 1,653 AFY or about 1.4 mgd. As of December 2021, there were 318 total non-potable water accounts. The total number of accounts has not grown appreciably since 2011 or so (see Figure 5-1b). Current non-potable water users include the City of Beaumont for street medians and common areas, homeowners' associations for common areas and clubhouses, Beaumont Unified School District for various schools, California Department of Transportation (CalTrans), and several commercial accounts including Lowe's Distribution, Home Depot, and others.

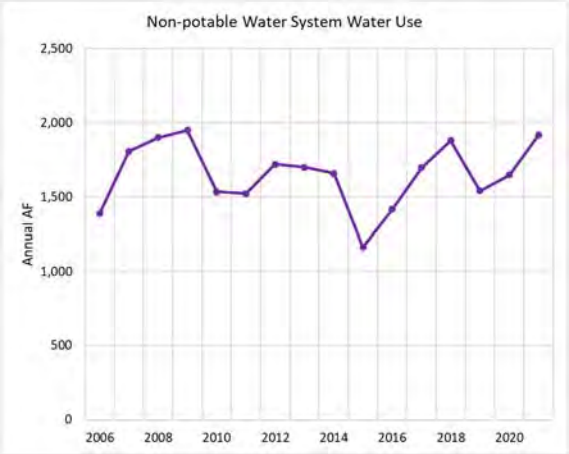


Figure 5-1a
Non-potable Water Use

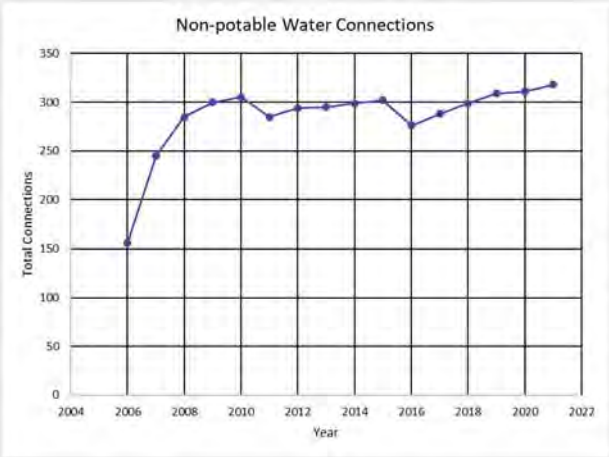


Figure 5-1b
Non-potable Water Connections

Figure 5-1b shows that from 2006 through 2010 non-potable water connection growth was rapid as new developments were started and it was necessary to irrigate start-up slope planted areas ("establishment water"). Once established, many of these connections are discontinued. Connection growth has stabilized recently at around 300 connections. Over the last few years only a few new connections have been added (2 new connections from 2019 – 2020 and 7 from 2020 – 2021). New connections typically occur in the initial phases of a development. The

severe drought in 2014 through 2016 impacted the recycled water use as users became more "water aware" and conservation-minded regardless of the source.

The existing non-potable water system consists of three pressure zones: 2800, 2600, and 2400 Zones. The "number" is the typical operating hydraulic grade line of the zone, relative to mean sea level. The 2800 Zone is the largest pressure zone, has the greatest demand, and covers the City of Beaumont north of the I-10 freeway generally, and the area south of I-10 east of 4th Street and Prime Drive. The 2800 Non-potable Water Zone is supplied the 2800 Zone NP water tank located at BCVWD's groundwater recharge facility site near Cherry Valley Blvd. and Beaumont Ave. which is supplied from non-potable Well No. 26, supplemented by potable groundwater as needed. Potable groundwater is introduced into the 2800 NP Zone Tank through an air gap. BCVWD has a Capital Improvement Project (NT-2800-0001) to install screening equipment on BCVWD's imported SPW supply pipeline to be able to effectively use untreated SPW in the non-potable system. The screened imported water would be introduced into 2800 Zone NP tank.

The 2600 and 2400 Non-potable Pressure Zones are south of I-10 and are currently isolated from the 2800 Non-potable Water Zone. Currently, the 2600 NP Pressure Zone is supplied from the 2650 Potable Water Pressure Zone (from the Hannon Tank) at an interconnection along Champions Dr. in Tournament Hills. Temporarily, this results and in a slightly higher operating pressure (higher HGL, 2650 vs. 2600 ultimate). The 2400 NP Pressure Zone is supplied from the 2370 Potable Water Pressure Zone through an interconnection on Palmer Dr. and Singh St. in Fairway Canyon and is on a slightly lower operating pressure (lower HGL, 2370 vs. 2400 ultimate). When recycled water from the City of Beaumont is available, the non-potable pressure zones will be isolated from the potable water pressure zones through a physical pipe separation and the operating HGLs will be set to 2600 and 2400, respectively. Permanent pressure regulating stations will be installed to supply the 2600 NP Pressure Zone from the 2800 NP Pressure Zone and the 2400 NP Pressure Zone from the 2600 NP Pressure Zone.

On-site landscaping systems for new developments since the early 2000s were designed for non-potable water use; they are connected to the non-potable water system and separately metered. Meters are read monthly. On-site retrofits for these locations will be minimal. Before recycled water is used in the non-potable system, site inspections and cross-connection testing will be performed according to SWRCB DDW requirements. In the future, there will be some existing parks, a cemetery, several schools, and other sites currently served from the potable water system that will have their irrigation connections severed from the potable water system and connected to the non-potable system. These locations will require significant site retrofit and cross-connection testing.

BCVWD also provides about 40 to 60 AFY of potable water (45 AF in 2021) to a small number of agricultural irrigation customers. These customers are almost exclusively in the Cherry Valley Area of the District; much of this is used to irrigate fruit orchards. Currently there are no plans to extend the non-potable water system to serve these customers.

Historic Water Use in BCVWD's Non-potable Water System

Table 5-1 presents a summary of the water used in the non-potable water system based on BCVWD's actual meter records (all services are metered). In Table 5-1, the data for 2005 is only a partial year. Non-potable water use increased since inception of the non-potable water system in 2005 to a maximum in 2009 when much of the landscaping for the housing boom was being established. There was a significant reduction in 2010 which could be due to BCVWD's new "tiered" water rate structure and/or the result of correcting the non-potable water accounts.[1] There was a significant reduction in demand in 2015 due to drought awareness and water restrictions.

Table 5-1
Historic Water Use in BCVWD's Non-potable Water System

Year	Annual Non-potable Water Use, acre-ft	Annual Non-potable Water Use, mgd	Maximum Month, AF	Average Day on Maximum Month, mgd
2005	419	--		
2006	1,387	1.23	199	2.13
2007	1,807	1.61	248	2.66
2008	1,899	1.70	250	2.68
2009	1,950	1.74	276	2.95
2010	1,534	1.37	248	2.66
2011	1,521	1.36	227	2.43
2012	1,721	1.54	261	2.79
2013	1,780	1.59	264	2.83
2014	1,658	1.48	261	2.80
2015	1,165	1.04	154	1.65
2016	1,347	1.20	211	2.26
2017	1,612	1.44	254	2.67
2018	1,879	1.68	267	2.81
2019	1,547	1.38	273	2.92
2020	1,647	1.47	290	3.11
2021	1,918	1.71	307	3.29
Average 2006-2021	1,653	1.48	251	2.69
Average 2010 -2020	1,616	1.44	254	2.72

[1] In 2010, BCVWD reviewed the account records and removed some landscape accounts that were previously included with the non-potable water system but were not connected to the non-potable water system.

Non-potable water demands are currently (2021) about 1,918 AFY (1.71 mgd) with about 307 AF used on the maximum month (3.29 mgd).

Monthly Variation in Non-potable Water Demand

Figure 5-2 shows the monthly variation in non-potable water use for the years 2013 through 2021. Up until June 2012, non-potable water accounts were “read” bi-monthly and are not included in Figure 5-2. Also shown is the CIMIS Potential Evapotranspiration Reference Value (ETo) for the area. Some conclusions which can be drawn are:

- There is a lag between the metered demand and the ETo demand due to the one month lag between non-potable water use and meter reading. Some of the difference could be due to different climate from year to year also.
- The peak month use can occur in any month from June through October.
- The ETo is greater than the non-potable demand late winter and spring (likely due to rainfall); the non-potable water demand is greater than the ETo value in the summer and fall (likely due to overwatering).

Figure 5-2
Monthly Variation in BCVWD’s Non-potable Water Use

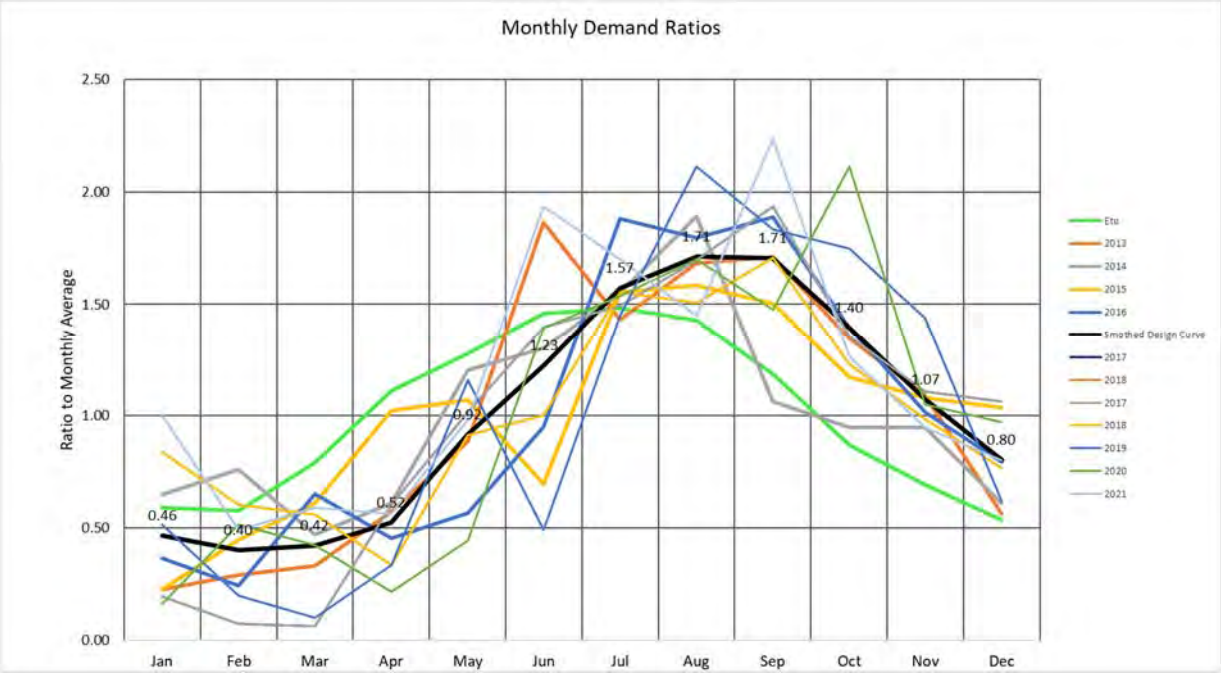


Figure 5-2 shows a significant variation in the non-potable water demand for the same month from year to year. Late winter and early spring rainfall will decrease the amount of recycled water use. For example, in 2017 and 2019, January and February were very wet in comparison to other years. The end of 2013 and beginning of 2014 was one of driest periods in recent years, resulting a significant winter/spring demand for non-potable water. Years 2020 and 2021

showed a high September and October non-potable water demand; but this was due to the dry summer and lack of September and October rainfall. During a normal year there is some summer monsoonal rainfall and October does have precipitation. The median ratio of the maximum month to average demand for the period 2013 through 2021 was 1.89; the maximum ratio was 2.11 (2019 and 2020).

Figure 5-2 contains a “smooth curve” which represents a likely design “average.” The monthly ratios to the annual average are noted in Figure 5-2. Of importance from a design standpoint is the annual maximum month demand and the resulting peak hour demand. The minimum monthly demand will be an important consideration in the longer term planning for advanced treatment to maximize the recycling of wastewater. It is also an immediate consideration non-potable water distribution and storage system water quality and pump station turn-down capacity.

The following can be concluded from the design curve:

Maximum monthly average/annual average demand = 1.9

Minimum monthly average/annual average = 0.35

Table 5-2 is a tabular summary of the monthly ratios. The smoothed curve intentionally uses a slightly higher maximum month peak ratio to be conservative.

Table 5-2
Ratio of Monthly Average Non-potable Water Use to Annual Average

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Average for 2013 through 2021	0.45	0.39	0.41	0.51	0.90	1.20	1.55	1.69	1.67	1.38	1.06	0.79
Smoothed Curve for Design	0.35	0.40	0.45	0.70	1.00	1.35	1.60	1.90	1.55	1.20	0.85	0.65

It is likely that the maximum monthly demands will reduce over time as more and more landscaped areas are converted to drip irrigation and turfed street medians are converted to drought tolerant landscaping over the coming years. But for this master plan, the more conservative ratios in Table 5-2 will be used. The ratios can be adjusted in future Master Plan updates.

Variations in the Non-potable Water Demand Over the Day

Maximum Day Demand

Data was not available to determine the historic maximum day demand in the non-potable water system prior connection Well 26 to the non-potable water system and the activation of the 2800

Zone Non-potable Water Tank, since the water going into the non-potable water distribution system was not metered. Only historical monthly data since 2013 was available for the non-potable water system as discussed previously. To estimate the non-potable water system maximum day demand, data from BCVWD's potable water system master plan was used. The potable water system maximum day demand to the average day demand on the maximum month, (maximum month demand), averaged 1.22 for the period 2005 through 2016.

Using a maximum month to average annual demand ratio of 1.90 for the non-potable water system (refer to Table 5-2 presented previously) and assuming the ratio of the maximum day demand to maximum month demand in the potable water system (1.22) can be applied to the non-potable water system, the non-potable water system maximum day demand would be 2.32 times the average annual demand, i.e., 1.9 x 1.22 = 2.32. For planning purposes, a ratio of 2.5 will be used. This is consistent with other non-potable water retailers in the area and can be adjusted in future updates to this Master Plan.

Peak Hour Demand

In 2015, BCVWD isolated the 2800 Non-potable Water Pressure Zone from the other pressure zones, connected Well 26 to the non-potable water system, and activated the 2800 Zone Non-potable Water Tank. This provided an opportunity to determine the amount of non-potable water used during the day in the 2800 Non-potable Water Pressure Zone. For the period of August 25, 2015 through September 2, 2015 ("study period") the metered production from Well 26, metered potable make-up water, if any, and water levels in the 2800 Zone Non-potable Water Tank were monitored through BCVWD's SCADA system. BCVWD performed a volumetric balance on the 2800 NP Zone Tank at half-hour intervals.

The data show some "spiking" in the ratios which can be attributed to the inaccuracies of the level measurements. Ultrasonic level sensors, used in BCVWD's tanks, have an accuracy of about 0.25% of the preset range. The 2800 Zone NP Zone Tank has a water depth of 16 ft; so the accuracy is ± 0.04 ft (± 0.5 inch). The 2800 NP Zone Tank is a 2 MG Tank with a diameter of 150 ft (132,115 gal/ft depth of water or about 5,300 gal/ 0.04 ft of water depth). Small level errors can make a large difference in the volumetric balance at any given time interval.

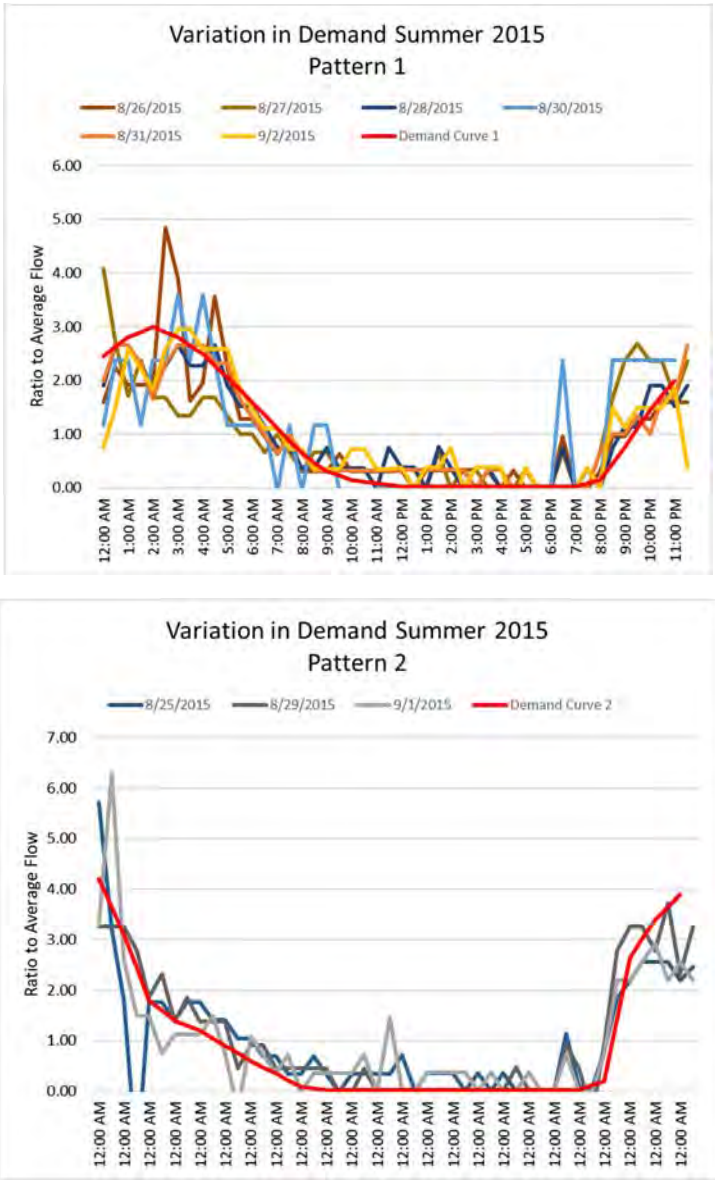
Although this study period may not have experienced the maximum day demand, the demand on the study days was substantial. The following is a summary of the study period:

Maximum Daily Demand (8/26/2015)*	1.97 mgd	6.05 AF
Average Daily Demand*	1.61 mgd	4.9 AF
Annual Average for 2015	1.04 mgd	3.19 AF
Max Daily Demand*/Annual Average for 2015	1.89	
Peak Hour to Average Daily Ratio (Maximum 9/1/2015)*	6.25	
Time of the Peak Demand	10:30 pm to 4:30 am	

*Over the period 8/25/2015 through 9/2/2015

In the analysis of the data, it appeared that there were two distinct demand patterns. Figure 5-3 contains “smoothed” curves in bright red for each observed pattern type that tries to capture most of the data. Non-potable water demand started about 8:00 pm and continued to about 8:30 am the next morning. Demand pattern 1 shows a lower, but more extended peak; demand pattern 2 showed a rapid rise at the start followed by a significant decline beginning about 1:30 am or so. Demand pattern 2 had a significantly higher peak.

Figure 5-3
Variations in Demand in 2800 Zone as a Ratio to Average for the Day
August 25 through September 2, 2015



There is no obvious explanation for the difference in the patterns. During the time the demand data was collected, BCVWD had water restrictions in place due to the drought. Lawn watering

and park and street median watering was restricted to between 8 pm and 8 am (Resolution 2015-05). However, there were no restrictions on the days allowed for watering.

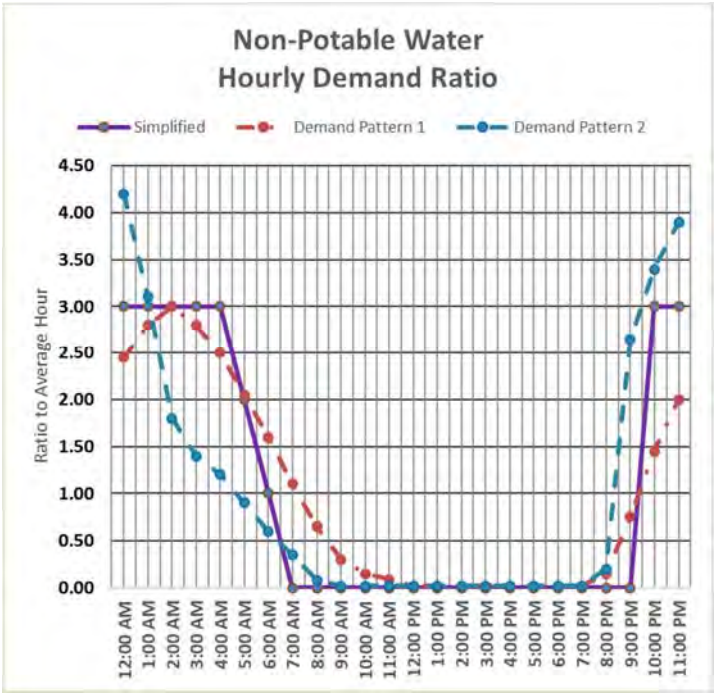
Table 5-3 summarizes data collected and the ranges of the ratio of the peak hour to average day for the study period 8/25 through 9/2/2015.

Table 5-3
Peak Hour to Average Day Analysis for 8/25 –9/2/2015

	For Period 8/25 – 9/2/2015	Using Average Annual Average Day for 2015
Range of Peak Hour/Average Day Ratio	2.65 - 6.29	1.8 -10.4
Median of Peak Hour/Average Day Ratio	3.73	4.85
Average of Peak Hour/Average Day Ratio	4.06	6.36

Figure 5-4 shows Pattern 1 and 2 smoothed curves along with a “simplified non-potable water demand pattern” which attempts to consolidate the Pattern 1 and 2 smooth curves. The simplified curve in Figure 5-4 will be used for design. The simplified curve has a peaking factor of 3.0 with a 1 hour “ramp up” in the evening and a 2 hour “ramp down” the following morning.

Figure 5-4
Hourly Peak Demand Ratio Comparison



Using a maximum day to average annual ratio of 2.5 as established above, and a peak hour: average hour on the maximum day of 3.0, the peak hour to annual average ratio will be 7.5.

Although the ratio of the peak hour to annual average ratio exceeded 7.5 during the study period, the 7.5 ratio reasonably fits BCVWD's experience. See Table 5-4. However, these peak hour to average day ratios should be monitored and adjustments made as necessary in future Master Plan updates.

In the future, the peak demand ratio may decrease as landscaped areas are converted over to low water using planting with drip irrigation systems as these systems tend to operate for longer periods of time. Future non-potable master plans can address this. But for current planning purposes a peak demand of 3 times the maximum day (MDD) or 7.5 x average annual demand will be used (Peak = 3 x 2.5 MDD or Peak = 7.5 x ADD).

Table 5-4 presents a summary of the peaking factors for BCVWD's non-potable water system for planning purposes, not considering the golf course irrigation demands.

Table 5-4
Non-potable Water Irrigation System
Master Planning Peaking Factors

Condition	Ratio to Average Day Demand
Average Day (annual basis)	1.0
Average Day on Maximum Month	1.9
Maximum Day	2.5
Peak Demand on Maximum Day for irrigation users	7.5

These peaking factors were compared with other agencies in Southern California and found to be reasonably consistent. See Table 5-5 for a comparison of peaking factors for other agencies.

The impact of the new landscape ordinances and directives are believed to reduce the maximum month and the annual water demand due to improvements in irrigation efficiency and the trend toward drip irrigation systems, the conversion of turf street medians to drought tolerant plantings, and the use of more low water using plantings in new developments where turf is restricted. The projections of non-potable use presented later in this section take in account the new landscape ordinances and the reduced water demands. It should be noted that BCVWD has observed some homeowners replacing the original low water using plantings with turf. BCVWD is working with the homeowner associations to prevent this from occurring. Those homeowners that have installed turf contrary to the current regulations are being notified to remove the turf.

The peak hourly demand factor will likely be affected by the new ordinances which require more subsurface drip irrigation be installed. These systems would allow longer irrigation periods, rather than the 8 hours used to develop Figure 5-4, presented previously.

The 2021 non-potable water demand, based on meter records, within each of the pressure zones is presented in Table 5-6. The ratio of the average day on the maximum month was 1.92

overall compared to the 1.9 in Table 5-2, presented previously. The ratios of the average day on maximum month to the average day for 2018, 2019, and 2020 were 1.71, 2.11, and 2.11 respectively. There are variations from year to year; but the data supports the 1.9 factor presented previously in Table 5-2.

Table 5-5
Recycled Water Peak Factors for Nearby Agencies

Agency	Max Day/Ave Day	Peak Hour/Ave Day
YVWD*[2]	2.5	6.7
East Valley WD[3]	2.7	8.1
Rancho California WD[4]	3.5	7.0
Eastern MWD[5]	2.0	5.3*
City of San Diego[6]	2.0	6.0
Otay WD[7]	2.0	6.0
Palmdale WD[8]	2.0	6.0
BCVWD	2.5	7.5

* Assumes a 9-hr irrigation period for YVWD

[2] YVWD (2008). Preliminary Design Report for the Phase II Non-potable Water Distribution System Expansion, prepared by Dudek, April. YVWD uses a ratio 2.68 x Maximum Day for Peak Hour equivalent to 2.5*2.68 = 6.7 for Peak Hour to Average Day demand over a 9-hour irrigation period

[3] East Valley WD (2014). Section 7, Recycled Water Master Plan, prepared by MWH, February.

[4] Rancho California WD (2015). Water Facilities Master Plan, December.

[5] ibid.

[6] ibid

[7] Otay WD (2008). Water Resources Master Plan Update, prepared by PBSJ, October.

[8] Palmdale Recycled Water Authority (2015). Recycled Water Facilities Master Plan, prepared by Carollo Engineers, January.

Table 5-6
2020-2021 Non-potable Water Demand by Pressure Zone

Pressure Zone	Demand, AFY	Average Day, AF (mgd)	Average Day on Max. Month, AF (mgd)	Ratio of Ave Day on Max Month/Ave Day	Percentage of Demand in Pressure Zone
2020 Demand Data					
2800	1,249	3.42 (1.12)	7.03 (2.29)	2.06	75.8%
2600	354	0.97 (0.32)	2.04 (0.66)	2.10	21.5%
2400	44	0.12 (0.04)	0.29 (0.09)	2.38	2.7%
Total	1,647	4.51 (1.47)	9.36 (3.05)	2.07	100%
2021 Demand Data					
2800	1,436	3.93 (1.28)	7.88 (2.57)	2.00	74.9
2600	428	1.17 (0.38)	2.04 (0.66)	1.74	22.3
2400	54	0.15 (0.05)	0.30 (0.10)	2.07	2.8
Total	1,918	5.25 (1.71)	10.22 (3.33)	1.95	100%

There is a 3000 Non-potable Water Pressure Zone under consideration, primarily to serve the Highland Springs (South) Golf Course; but at this point there are no facilities in the 3000 Pressure Zone. The Highland Springs Golf Course has an average demand of about 138 AFY (average consumption 2017 through 2021).

Golf Course Demand

Golf courses typically use water hazards as water reservoirs with the water hazards (lakes) replenished with recycled water. The peaking factor for golf courses depends on their operation and the surface area and “hardscape height” of the shoreline of the water hazards. At daybreak, normal operation is to have water hazards at a normal (minimum) operating level, but still with the entire surface area of the hazard covered with water. The hazards or lakes would be filled to a maximum level, using recycled water, over the period from daybreak to sunset, to allow irrigation to proceed during the night using the golf course irrigation pumps.

Monthly irrigation demands for Oak Valley Greens (Oak Valley) and Morongo Golf Club at Tukwet Canyon (Tukwet Canyon) Golf Courses were taken from annual Watermaster reports; Highland Springs Golf Course in the 3000 Zone, demands were based on the golf course’s potable water demands from 2017-2021. The lake/water hazard surface areas were determined from Google Earth. An analysis was prepared to identify the recycled water replenishment flow rate into the lakes/hazards for each of the golf courses. Table 5-7 presents the results of the analysis.

For the analysis only 75% of available daylight hours was used for lake replenishment to provide some contingency for exceptionally warm days. The summertime lake replenishment rate ranges from 2.2 to 3.1 times the monthly average demand.

Table 5-7
Golf Course Peak Lake Replenishment Demands

Golf Course	Average Annual Demand, AFY	Average Maximum Monthly Demand, AF (gpm)	Lake or Water Hazard Surface Area, acres	Maximum Summer Replenishment Rate, gpm	Typical Winter Spring/Fall Replenishment Rate, gpm	Maximum Summer Lake or Water Hazard Depth Fluctuation, ft
Oak Valley Greens (2006 – 2021)	631.6	129.3 (975)	3.5 (2 lakes)	1,942	400-800	0.91
Tukwet Canyon (2000 – 2021)	1,000	166.3 (1,255)	2.8	2,479	650 – 1200	1.71
Highland Springs South (2017 – 2021)	116.8	18.2 (138)	0.7 (2 lakes)	305	60 - 290	0.8

At this time, BCVWD does not have enough recycled water available to meet its projected non-potable water demands during the summer demand period and it is unlikely that recycled water would be available for the Oak Valley Greens and Morongo Tukwet golf courses during the summer. The golf courses would rely on their own wells during the peak demand periods. BCVWD could serve the golf courses during the Fall and Spring seasons (“shoulder months”) when there is surplus recycled water available. The replenishment rate is lower during the shoulder months since the monthly demand is lower as shown in Table 5-7.

Highland Springs Village has two golf courses. The northerly, or older golf course is on private wells and would continue to be on private wells. The newer, south golf course is currently receiving potable water from BCVWD’s 3040 Potable Water Pressure Zone System through six meters. This golf course should be converted to non-potable when adequate recycled water is available, however this would require the 3000 Pressure Zone to be constructed. .

Projected Non-potable Water Demands

BCVWD’s non-potable water demands have evolved over the years, particularly as regulations on indoor water use and landscaping restrictions occurred. Many of the developments that had traditional parks planned, have changed to less water using “passive” parks requiring less water. Some previously planned residential developments have been redesigned as large “big box” warehouses and distribution centers. Before presenting the non-potable water demand forecasts for this master plan, a summary of the forecasts presented in previous planning efforts is appropriate.

Historical Perspective

BCVWD 2013 UWMP

The BCVWD 2013 UWMP provided projections of the non-potable water demand through 2035 based on an estimated year 2015 demand of 1,500 AFY. At the time the 2013 UWMP was being prepared, a decision was made to be conservative with respect to potable water demand and to not overestimate the non-potable water demand. The projections in the 2013 UWMP are shown in Table 5-8 for reference.

Table 5-8
Non-potable Water Demands in 2013 UWMP, AFY (for reference)

Year				
2015	**2020**	**2025**	**2030**	**2035**
1,500	1,580	1,660	1,740	1,830

The linear growth rate in non-potable water demand in the 2013 UWMP for 2015 to 2035 in Table 5-8 is 1.1% per year.

Facilities Planning Report for Recycled Water Supply Pipeline and Pump Station

BCVWD prepared a Facilities Plan Report for a connection to YVWD's non-potable water system which was approved by the SWRCB for SRF Loan and potentially Water Recycling Bond Funding in June 2014.[9] This connection is no longer being considered at the present time since YVWD is precluded from distributing recycled water outside of the YVWD's service area boundary by the conditions of their "Change Permit" with the SWRCB Division of Water Rights. The long-term (build-out) non-potable water demand was determined to be 3,710 AFY, not including any of the golf courses. The 3,710 AFY included the existing connections at the time plus any additional development to occur in on-going projects plus planned new developments. The long-term demand also included connection of a number of existing landscape users such as schools, cemeteries, and parks that could reasonably be served by the non-potable water system, but were not yet connected to the non-potable water system. Some of these users need to have pipelines extended to their facilities. Some of these pipeline extensions have been included in this master plan. The Facilities Plan Report also envisioned serving Tukwet Canyon (1,250 AFY) and Oak Valley Greens Golf Courses (750 AFY) at some point. Ultimately, Highland Springs Golf Course (200 AFY estimated) was envisioned to be served as well. Table 5-9 presents the forecasted non-potable water demands in the Facilities Planning Report for reference.

[9] Recycled Water Facilities Planning Report for Recycled Water Pipeline and Pump Station, prepared by BCVWD, Water Recycling Program (WRFP) Project No. 3844-010, June 2014, approved Aug 20, 2014.

Table 5-9
Non-potable Water Demands in Facilities Planning Report, AFY

	2015	2020	2025	2030	2035	2040	Build-out
Landscaping	1,753	1,906	2,374	2,931	3,228	3,449	3,710
Golf Courses		750	750	750	2,000	2,000	2,200
Total	1,753	2,656	3,124	3,681	5,228	5,449	5,910

The landscape demands in Table 5-9 grew at a significantly higher rate than the growth presented in Table 5-8 in the 2015 UWMP. The annual landscape demand growth rate in Table 5-9 for 2015 to 2035 is 4.2%, a figure that is now considered very high.

BCVWD 2015 Potable Water Master Plan

The BCVWD 2015 Potable Water Master Plan contained forecasts for non-potable water since non-potable water use would offset the need for imported water as well as affect the amount of forbearance water considered by Watermaster in the annual accounting of water in storage in the Beaumont Basin. The Potable Water Master Plan included a water supply analysis under three scenarios: maximum reliance on imported water, a “middle ground” approach, and maximum local water resources (i.e., minimizing imported water). The latter included a maximum use of recycled water including supplying non-potable water to golf courses to maximize the amount of forbearance water and consequently maximizing the amount of groundwater storage which could be pumped for potable uses. The middle ground approach envisioned meeting only the BCVWD landscape demands and having the golf courses, (Oak Valley and Tukwet Canyon), continue on their private wells.

The non-potable water demands used in the scenarios in the 2015 Potable Water Master Plan were the same as those presented previously in Table 5-9.

2015 UWMP

The 2015 UWMP required a discussion on the use of recycled water as a water source in BCVWD’s service area and required coordination with the recycled water producers, which in the case of BCVWD, are YVWD and the City of Beaumont. See Section 4 of this Non-potable Water Master Plan. A projection was made of the amount of recycled water available from both agencies. BCVWD provided estimates of YVWD and City of Beaumont (CoB) recycled water use in the 2015 UWMP. These are shown in Table 5-10 and were extracted from Tables 6-19 and 6-20 in the 2015 UWMP.

The amounts shown in Table 5-10 and used in the 2015 UWMP were obtained from a month by month analysis of supply and demand to maximize the use of recycled water. The values in Table 5-10 show only the portion of the landscape and golf course demands that are met with recycled water. The recycled water supplied by YVWD and the City of Beaumont were supplemented with imported water and non-potable groundwater, as needed. Not all of the golf

course demands are intended to be supplied by BCVWD; the golf courses have their own wells which can be used to supplement the District's supply.

The result of the modeling showed that during the winter months, the landscape demands, even with the golf courses, were less than the recycled water available. The 2015 UWMP envisioned advance treating the unused recycled water and percolating into the Beaumont Basin where it would add to BCVWD's groundwater storage account. In 2015 UWMP analysis, TDS limitations in the non-potable water system were not addressed.

Recycled Water Salinity Management Plan

In March 2017, BCVWD prepared a plan to demonstrate that the Regional Board's 12-month running annual average Maximum Benefit TDS concentration in the non-potable water system of 330 mg/L can be met making full use of the City of Beaumont's recycled water. The landscape and golf course demands used in the analysis were those in Table 5-9, presented previously. Desalination of the City of Beaumont's effluent would not be required until after 2035. Although this would meet the Regional Board's Maximum Benefit Water Quality Objective for the Beaumont Basin, the City of Beaumont's new NPDES and Recycled Water Permits, (CA0105376 and R8-2015-0026, respectively), require the salinity objective (330 mg/L) to be met at the point of discharge. Subsequent blending with imported water cannot be considered. The results of the Salinity Management Study were presented to the Regional Board toward the end of 2019, but the Regional Board indicated they were not going to change the permit to allow for blending.

Table 5-10
Summary of Recycled Water Use in BCVWD 2015 UWMP, AFY

	2015	2020	2025	2030	2035	2040
YVWD Landscape	0	921	977	1,018	1,028	1,032
CoB Landscape	0	822	1,117	1.462	1.753	2,019
Subtotal Landscape Demands met with Recycled Water	0	1743	2,094	2,480	2,781	3,051
YVWD Golf Course	0	121	66	25	16	11
CoB Golf Course	0	332	365	387	441	517
Subtotal Golf Courses Demands met with Recycled Water	0	453	431	412	457	528
Total Irrigation Demands met with Recycled Water	0	2,196	2,525	2,892	3,238	3,579
CoB Available for Advanced Treatment and Potentially Recharged	NP	NP	418	481	646	827
Total Recycled Water Potentially Used	0	2,196	2,943	3,373	3,884	4,406

CoB = City of Beaumont Recycled Water; NC = Not Planned

2020 UWMP

The 2020 UWMP required a discussion on the use of recycled water as a water source in BCVWD's service area and required coordination with the recycled water producers, which in the case of BCVWD, are YVWD and the City of Beaumont (City). See Section 4 of this Non-potable Water Master Plan. A projection was made of the amount of recycled water available from the City (YVWD is no longer considered). BCVWD provided estimates of the City recycled water use in the 2020 UWMP. The estimates provided in the 2020 UWMP were derived from a previous, draft version of this Non-Potable Master Plan. Based on the population projections from the 2020 UWMP, estimated recycled water available has been reevaluated.

The recycled water supplied by the City will be supplemented with imported water and non-potable groundwater as needed. Not all of the golf course demands are intended to be supplied by BCVWD; the golf courses have their own wells which can be used to supplement the District's supply.

The result of the modeling showed that during the winter months, the landscape demands, even with the golf courses, were less than the recycled water available. The 2020 UWMP also discussed advance treating the unused recycled water and percolating into the Beaumont Basin where it would add to BCVWD's groundwater storage account.

See Section 4 for further discussion regarding the methodology for estimating recycled water supply.

Summary

BCVWD believes the non-potable water demands presented in these previous planning studies (not including the 2020 UWMP) may have overstated the future supply and demands. Figure 5-1a, presented previously shows the non-potable water demand from inception of the non-potable water system. With increased regulations on water-efficient irrigation fixtures, it is highly likely that the non-potable water demand will trend downward. BCVWD irrigation demands were substantially higher in 2021 than previous years, but based on an analysis of the long-term average non-potable demand, irrigation demands will ultimately decrease over time. As the BCVWD service area continues to develop,large tracts will be fully constructed with landscaping complying with new low-water using planting requirements.

Long-term Non-potable Water Demands for Master Planning

Development of the long-term non-potable water demands is described in the following subsections, including the basis for the projections, the build-out demands and the growth of the demands over time.

Basis for Non-potable Water Projections

There are several major development projects that are either in or have gone through the City of Beaumont's planning process. These include Fairway Canyon Phase IV, remainder of Tournament Hills, Kirkwood Ranch, Noble Creek Vistas, and Beaumont Pointe (formerly Jack Rabbit Trail). Water Supply Assessments (WSAs) have been prepared for various projects which identify the potable and non-potable water demands. Legacy Highlands, a project referenced in previous master plans and UWMPs is not moving forward any time soon in its present form (circa April 2019). An estimate of non-potable water demand has been provided in this master plan in the event a project moves forward. Beaumont Summit Station, an industrial warehouse project, is currently planned for the Sunny Cal Egg Ranch site which was formerly a residential development.

Water Supply Assessments (WSAs) for these projects provide data for estimating the future non-potable water demands. In addition, there are some existing landscaped areas, such as parks, schools, street medians, etc. which will be converted over to non-potable use as funds and recycled water becomes available. These facilities are currently on potable water and BCVWD has meter records of their consumption. Over time, many of these currently irrigated landscaped areas will be gradually converted to lower water-using plantings to comply with new regulations. This has been considered in the estimates for future non-potable water demands.

DWR's Model Water Efficient Landscape Ordinance (MWELO)[10] was used as the basis for determining the irrigation demands for future development projects. The reference ETo was 55 in/yr (acre-in/acre/year) and an evapotranspiration adjustment factor of 0.45 was used for non-

[10] As approved by California Water Commission, July 15, 2015

residential areas. In the development of the water use for landscaped areas, a mix of irrigation methods and planting was used for estimating purposes as described below.

Street and Median Landscaping

Typical residential/commercial street landscaping demands were determined from typical street sections shown on actual or tentative tract maps. Non-potable water irrigation estimates for streets and medians is based on Table 5-11.

Table 5-11
Basis for Future Street Median Non-potable Water Demands

Area with drip	40%
Area with bubblers	60%
Low water using plantings (PF = 0.2)	80%
Moderate water use plantings (PF = 0.5)	20%
Estimated total water use (ETWU)	1.5 AFY/acre
Maximum allowable water use (MAWU)	2.1 AFY/acre

Parks

Non-potable water use by parks is dependent on the type of park use. Generally most parks will have limited or minimal turf areas; however, the City of Beaumont has stated there is a deficiency in sports and playfields for youth athletics such as soccer, flag football, and baseball. Some parks that currently have low water using landscaping or are minimally irrigated may be converted to athletic fields at some point in the future. To estimate park landscaping non-potable water use, three “model” parks were developed: a typical park, a low water-using park, and a park with athletic fields. Data is shown in Table 5-12.

Table 5-12
Basis for Future Park Area Non-potable Water Demands

	Typical Park	Low Water-using Park	Park with Athletic Fields
Area with drip	30%	100%	10%
Area with bubblers	45%		15%
Low water using plantings (PF = 0.2)	30%	100%	15%
Moderate water use plantings (PF = 0.5)	45%		10%
Special turfed areas	25%		75%
Estimated total water use (ETWU)	2.3 AFY/acre	1.1 AFY/acre	3.9 AFY/acre
Maximum allowable water use (MAWU)	2.7 AFY/acre	2.1 AFY/acre	3.9 AFY/acre

Cemeteries and Similar Turf Areas

Non-potable water use by cemeteries and similar turfed areas was estimated based on the data in Table 5-13.

Table 5-13
Basis for Cemetery and Similar Areas Non-potable Water Demands

	Typical Cemetery
Area with drip	5%
Area with bubblers	5%
Low water using plantings (PF = 0.2)	10%
Moderate water use plantings (PF = 0.5)	
Special turfed areas	90%
Estimated total water use (ETWU)	4.2 AFY/acre
Maximum allowable water use (MAWU)	4.3 AFY/acre

Schools

Except for Starlight Elementary School at Cougar Way and Starlight Ave., all of the schools are either older schools that are served by potable water or schools that were designed and constructed under older landscaping ordinances, e.g., Three Rings Elementary, Tournament Hills Elementary, Beaumont High School, Mountain View Middle School and others. The non-potable water use by these older facilities would not be representative of new schools designed to conform to the new MWELO. The landscape irrigation plans for Starlight Elementary School were used as a basis for projecting future non-potable water demands. The site is 12 acres (total) with about 55% of the total area landscaped in one form or the other. There were 2.3 acres (19.2% of the total site) that were turfed for athletic fields. The non-potable water use for the facility was estimated on the landscape plans to be 14 AFY or 1.2 AFY/A based on the total site area. This average water use will be used for any future school.

Existing school non-potable water will be based on their current non-potable water demands. It is expected that the non-potable water use will decrease over time as some of the landscaping is converted to low water using materials.

Total Non-Potable Water Demands at Build-out

Tables 5-14a through 5-14f show the 2021 demands as identified previously in this section and estimated ultimate non-potable water demand at build-out for the 2400, 2600, 2800, and 3000 Non-potable Water Pressure Zones. The demands do not include the Oak Valley or Morongo Tukwet Canyon demands. Table 5-14e lists the existing facilities within the 2800 Non-potable Pressure Zone which are currently on the potable water system and which are not anticipated to

be converted to non-potable water primarily because the amount of water used at these sites is minimal and cost to convert is excessive for the amount of potable water saved.

Table 5-14a
Developments and Projects in 2400 Non-potable Water Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Estimated Development Area, Acres	Water Duty Factor, ft/yr	Non-potable Water Demand, AFY	Source of Data, Comments
29H	400	Nicklaus Park conversion of Frisbee Golf to Turfed Atlhletic Fields	6.3	3.9	24.6	Estimate for turfed athletic fields with some low water using surrounding landscaping
		Total Additional Demands			25	
		Existing 2021 Demands			54	
		Total Existing and Additional Demands			79	

Table 5-14b
Developments and Projects in 2600 Non-potable Water Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Estimated Irrigated Area, Acres	Water Duty Factor, ft/yr	Non-potable Water Demand, AFY	Source of Data, Comments
8		Oak Valley Champions Commercial 30 ac (15% Landscaped)	4.5	1.5	6.8	
29		Fairway Canyon Phase 2			9.1	Includes Park in PA 17 and Tukwet Canyon Street Landscaping
29		Fairway Canyon Phase 4			21.7	Includes Park in PA 21B and Tukwet Canyon Street Landscaping
36		Hidden Canyon Industrial			35.0	From WSA
2		Tournament Hills Phase 3			7.7	Includes Parks in PA 17 and 18
(109)		Beaumont Urban Village 282 ac (15% landscaped), previously Mountain Bridge Development	40	1.5	60.0	
(110)		**Legacy Highlands Site**				From WSA, apportioned to 2600 Zone
		Commericial/Industrial			36.2	
		Active Open Space			47.9	
		Street Medians and sides Landscaping			28.2	
		Total Legacy Highlands Site			112.2	
		Fairway Canyon Lift Station			0.2	Estimated
6		Heartland Olivewood			20.0	From Landscape Plans
		Total Additonal Demands without Tukwet Golf Course			273	
		Existing 2021 Demands			428	
		Total Existing and Additional Demands			701	

Table 5-15 summarizes the non-potable water demands by pressure zone current (2021) and at build-out with and without the Oak Valley and Tukwet Canyon. The Golf Course demands were the most recent 10-year moving average, taken from the Beaumont Basin Watermaster Annual Pumping Reports.

Table 5-15 also shows that the total non-potable water demand will increase from the current (2021) amount of 1,918 AFY to 2,843 AFY with the addition of the demand from projected new developments and conversion of existing landscape irrigation demands to the non-potable water system. If the Oak Valley and Morongo Tukwet Canyonwere included the total ultimate non-potable water demand would be 4,353 AFY.

The Morongo Tukwet and Oak Valley Greens Golf Courses have overlying right in the Beaumont Basin and use these rights to irrigate the golf courses and supply their potable water demand. Consideration could be given to irrigate the golf courses during the “shoulder months,” (October through March) when there is ample recycled water available. This would make the equivalent groundwater available for potable purposes. The total “shoulder month” demands from the two golf courses is 463 AFY as is shown in Table 5-16.

Table 5-14c
New Developments and Projects in 2800 Non-potable Water Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Estimated Irrigated Area, Acres	Water Duty Factor, ft/yr	Non-potable Water Demand, AFY	Source of Data, Comments	Meter No
		New Facilities					
10		Noble Creek TR 29267			11.9	Estimated from Final Water Plans	
40		Beaumont Summit Station (TR 36583) (324 ac)			41.0	Estimated from Final Water Plans	
7 & 27		Tuscany Townhomes and Villas (11 ac)	1	2.3	2.3		
13		Beaumont Commons (4 ac)	0.4	2.3	0.9		
12		Oak Valley Village (50 ac) (15% Landscaped)	7.5	1.5	11.3		
14		Kirkwood Ranch			10.8	Estimated from Final Water Plans	
20		Dowling Orchard Industrial Park remaining Phase (26 ac)			5.2	Based 0.2 AFY/site acre from similar facilities	
24		Beaumont Industrial Park (250 ac)			20.0	Estimated, No Maps or Plan Available	
32		Jerome Taurek TR 31162 (130 ac)			20.0	Estimated, No Tent. Tract Maps/Spec Plan	
46		Sundance Corporate Center (13.6 ac) (15% landscaped)	2	1.5	3.0	Estimated	
45		San Gorgonio Village (10.3 ac) (15% Landscaped)	1.5	1.5	2.3	Estimated	
39		Pacific Scene (Manzanita) , TR32850, Park simlar to adjacent to North	0.5	2.3	1.2	Similar to Phase 1 Development, similar park area	
26		Potrero Creek Estates (310 ac)			35.0	Estimated based on AFA/Gross Acre, No Tent.	
		Subtotal			165		
41		***Legacy Highlands Site***				From WSA, adjusted by pressure zone.	
		School			21.9		
		Active Open Space			16.0		
		Street Medians and side Landscaping			28.2		
		Total Legacy Highlands			66		
17		***Sundance Additional***					
		Cascade Park Sundance (PA 37)	2.7	1.1	3.0	Estimated from Planning Maps	
		Rec Center, Sunpark Dr (PA-32)			2.5		
		Discovery Way Entrance	3.6	1.5	5.4		
		Tioga Park Rec Center (PA-45)			3.3		
		Paseos Planning Areas 30,31,33,34	2.5	1.1	2.8		
		Cherry Ave Landscaping	0.75	1.5	1.1		
		Mary Lane Landscaping	0.2	1.5	0.3		
		Brookside Landscaping	1	1.5	1.5		
		Starlight Landscaping	1.2	1.5	1.8		
		Total Sundance Additonal			22		
		Subtotal New Developments to be Added			252		

Table 5-14d
Existing Facilities to be Retrofitted and Connected to 2800 Non-potable Water Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	Anticipated Year						
				2022	2025	2030	2035	2040	2045	Build-out
		Existing Facilities to be Retrofitted:								
	100	Rangle Park	2.0				2.0	2.0	2.0	2.0
	101	Viele St. Park (7th and Viele St.)	0.6				0.6	0.6	0.6	0.6
	102	California and 7th Park	0.8				0.8	0.8	0.8	0.8
	103	Sports Park	51.0			51.0	51.0	51.0	51.0	51.0
	104	San Gorgonio Middle School & Beaumont Adult School (1591 Cherry)	24.4					24.4	24.4	24.4
	105	Noble Creek Park	57.3				57.3	57.3	57.3	57.3
	106	Mountain View Cemetery (Summit Cemetery District), 7.1 acres	17.7					17.7	17.7	17.7
	107	Not used								
	108	Brookside Elementary School	23.8			23.8	23.8	23.8	23.8	23.8
	109	Beaumont Park and Rec 650 Oak Valley Pkwy; Oak Valley Parkway Landscaping	4.3						4.3	4.3
	110	Solera HOA, 1615 Fairway Dr, Community Center and Pool	0.6			0.6	0.6	0.6	0.6	0.6
	111	City of Beaumont Street Landscaping, Cougar Way @ Palm Ave @ 1605 Palm Ct.	0.2			0.2	0.2	0.2	0.2	0.2
	112	City of Beaumont Street Landscaping, Cougar Way @ Quail Summit	0.4			0.4	0.4	0.4	0.4	0.4
	113	City of Beaumont Street Landscaping, Brookside Ave @ Howard Way	0.6			0.6	0.6	0.6	0.6	0.6
	114	Beaumont Sports Park	0.7			0.7	0.7	0.7	0.7	0.7
	115	Not used								
	116	City of Beaumont, 10th St at Orange, Park, W of Pool, Stewart Park	3.9				3.9	3.9	3.9	3.9
	117	City of Beaumont, on Orange N/o 10th St Stewart Park	8.2				8.2	8.2	8.2	8.2
	118	Rcoe-Beaumont Head Start, 600 E 8th St.	3.5				3.5	3.5	3.5	3.5
	119	Palm Elementary School Ath Field; Orange Ave, S/o 8th St	4.3				4.3	4.3	4.3	4.3
	120	SCE Maraschino Sub Sta, 4th & Viele St	2.6					2.6	2.6	2.6
	121	Sundance Community Assn, 1317 Mistletoe Dr, Walkway Easement	0.2						0.2	0.2
	122	City of Beaumont, 70 Seneca Springs Pkwy, Park at Potrero & Senseca Sprgs Pkwy	0.1						0.1	0.1
	123	M&R Beaumont Partners, Oak Valley Towne Center, 1400 Beaumont Ave.	1.5						1.5	1.5
	124	Sundance Community Association, 1107 Periwinkle Ln, Walkway Park	2.6						2.6	2.6
	125	3 Rings Ranch Entrance, end of 8th St.	10.0			10.0	10.0	10.0	10.0	10.0
	126	Rancho Ready Mix	11.0		11.0	11.0	11.0	11.0	11.0	11.0
	127	Highland Academy Charter School	5.0					5.0	5.0	5.0
		Subtotal Existing Facilities to be connected	237		11.0	98.3	178.9	228.6	237.3	237.3
		Total Zone Additional Demand	490	16.3	54.1	167.9	290.5	409.1	474.7	487.8
		Existing 2021 Demands	1436							
		Total Existing and Additional Demands	1926	1452	1490	1604	1726	1845	1911	1924

Table 5-14e
Existing Facilities in 2800 Non-potable Water Pressure Zone
Not Proposed for Connection to Non-potable Water System at Present

Project Name or Location	Non-potable Water Demand, AFY	Source of Data, Comments
Estrella Condominium Assn, Edelweise Rec Center and Irrigation	0.7	4 yr avg Book 45 consumption 2016-2019, constru
Park Brownie Way & Kobe St Pacific Scene	1.4	4 yr avg Book 45 consumption 2016-2019; no Non-potable lines nearby. Maybe long range future
Pardee Homes Design Center, 1580 E 8th St.	1.1	4 yr avg Book 45 consumption 2016-2019 Future Disposition?? Would require 1600 ft main extension from Xenia
Larry Lanning, Jats Plaza Shopping Center, 1680 E 6th	0.48	4 yr avg Book 45 consumption 2016-2019; 2000 ft
City of Beaumont Street Landscaping along Lemon, CV Acres and Lemon	1.05	4 yr avg Book 45 consumption 2016-2019; requires 1200 ft 4 in from Brookside Ave
City of Beaumont Street Landscaping, CV Acres at Shane Lane, Pocket Park	1.01	4 yr avg Book 45 consumption 2016-2019; requires 1200 ft 4 in extension from CV Acres and Lemon
Oak Valley II Community Association, N end of Straightaway Dr., Fuel Mod Irrigation?	2.3	4 yr avg Book 45 consumption 2016-2019; requires 1900 ft extension in Straigtaway
M&R Beaumont Partners, Oak Valley Towne Center, Beaumont Ave. & Oak Valley Pkwy NE Corner	0.2	4 yr avg Book 45 consumption 2016-2019; require
City of Beaumont, 601 E 12th St., Landscaping along S side 12th at Orange	0.3	4 yr avg Book 45 consumption 2016-2019; requires 800 ft of 4 in pipe in 12th st. Likley only user.
Sundance Community Assn, 1312 Arbolita St. Valley Rose Way & Arbolita, Park	0.4	4 yr avg Book 45 consumption 2016-2019; 530 ft 4 " extension from non-potable pipe in Cherry Ave. to park at Arbolita and Valley Rose
Sundance Community Assn, 1370 Grapeseed Ln, Park	0.5	4 yr avg Book 45 consumption 2016-2019; 1000 ft of 4 in extension from Cherry Ave.
Sundance North Community Association, 1650 Croton St, Pool and Rec Center	2.0	4 yr avg Book 45 consumption 2016-2019; pool and rec center. Bulk of demand is pool and indoor.
LINC- Beaumont Apts LP, 735 Illinois Ave.	1.4	2019 Consumption
LINC- Beaumont Apts LP, 735 Illinois Ave.	0.3	2019 Consumption; requires 350 ft extension from
Liz Marto LP, Maya Chevron, 325 Luis Estra	0.3	2019 Consumption
Liz Marto LP, Maya Chevron, 325 Luis Estra	0.1	2019 Consumption; 1300 ft extension from Viele S
Sundance North Community Association, Rec Center on Croton and Manache, 1632	0.7	require 1200 ft extension of NP in Cougar to Manache then to Croton
Subtotal not to be connected	12.7	

Table 5-14f
Developments and Projects in 3000 Non-potable Water Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	Souces of Data/Comments	Meter No
	200	Brookside Street Landscaping	8.6		
	201	Highland Springs South Golf Course	116	From 2017 - 2021 Potable water Meter Records; North GC on Private Well	005075-000, -001,-002,-003,-004,-005
	202	BCVWD Noble Creek Recharge Site. CV & Beaumont Ave	12.0	Reduced from 2013 Potable water Meter Records (14.5 AFY) due to reduction in landscape maintenance	014109-009
	203	BCVWD Cherry Tank Site	0.9	Reduced from 2013 Potable water Meter Records (23 AFY) due to conservation	014109-011
	204	Bcv Rec & Park District Cherry Valley Grange	0.8	Reduced from 2013 Potable water Meter Reco	013218-005
		Total Additional Facilities	138		
		Existing 2021 Demands	0		
		Total Existing and Additional Demands	138		

Table 5-15
Summary of Non-potable Water System Demands with and without Oak Valley and Tukwet GCs (AFY)

Zone	2021 Demand	New Developments and Projects	Retrofit of Existing Facilities	Total Ultimate Demand, without GCs	Oak Valley and Tuckwet GCs	Total Ultimate Demand incl. GCs
2400	54	25	--	79		79
2600	428	273	--	701	923	1,624
2800	1,436	252	237	1,925	587	2,512
3000	0	0	138	138		138
Total	1,918	550	375	2,843	1,510	4,353

Note: 3000 Zone Demand Incl. Highland Springs GC (South)
Morongo Tukwet in 2600 Zone; Oak Valley Greens in 2800 Zone

Table 5-16
Summary of Non-potable Water System Demands with Oak Valley and Tukwet GCs During Shoulder Months Only (Oct through Mar), (AFY)

Zone	2021 Demand	New Developments and Projects	Retrofit of Existing Facilities	Total Ultimate Demand, without GCs	Oak Valley and Tuckwet GCs	Total Ultimate Demand incl. GCs
2400	54	25	--	79		79
2600	428	273	--	701	268	969
2800	1,436	251	237	1,925	195	2,119
3000	0	0	138	138		138
Total	1,918	549	375	2,843	463	3,305

Note: 3000 Zone Demand Incl. Highland Springs GC (South)
Tukwet in 2600 Zone; Oak Valley in 2800 Zone

By 2025, about 1,963 AFY would be available from the City of Beaumont's Treatment Facility; this will increase to 3,249 AFY by buildout per the projections in Table 4-4 presented previously. Note, this amount greater than previously identified. The 2020 UWMP utilized data for recycled water generation from a previous draft of this Master Plan; actual recycled water supplies at buildout are likely to be less than projected as part of this Master Plan. The recycled water available as shown previously in Table 4-4 and further hereon includes the reduction for habitat maintenance and reject water brine. Based on this, there is ample recycled water available on an annual basis to meet the non-potable water demand, even with the golf courses. However, the peak seasonal demands preclude supplying non-potable water to the golf courses year around as is discussed later in the section.

Projected Non-potable Water Demands through Build-out

The non-potable water demands in Tables 5-14a through 5-14d and 5-14f, presented previously, were projected at 5-year intervals from 2020 (starting at 2022) through 2045 based on BCVWD's analysis of development activities, development progress, and the historical EDU absorption rate in the City of Beaumont (about 500 to 600 EDUs/year).

Tables 5-17a through 5-17d show the estimated period of connection and the estimated non-potable water demand by pressure zone for the 5-year periods 2020 (starting at 2022) through 2045 along with the build-out demand.

Table 5-17a
Projected Non-potable Water Demand in 2400 Pressure Zone

				Anticipated Year						
City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	2022	2025	2030	2035	2040	2045	Build-out
29H	400	Nicklaus Park conversion of Frisbee Golf to Turfed Atlhletic Fields	24.6		24.6	24.6	24.6	24.6	24.6	24.6
		Total Additional Demands	25	0	25	25	25	25	25	25
		Existing 2021 Demands	54							
		Total Existing and Additional Demands	79	54	79	79	79	79	79	79

Table 5-17b
Projected Non-potable Water Demand in 2600 Pressure Zone

				Anticipated Year						
City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	2022	2025	2030	2035	2040	2045	Buildout
8		Oak Valley Champions Commercial 30 ac (15% Landscaped)	6.8			6.8	6.8	6.8	6.8	6.8
29		Fairway Canyon Phase 2	9.1		9.1	9.1	9.1	9.1	9.1	9.1
29		Fairway Canyon Phase 4	21.7		21.7	21.7	21.7	21.7	21.7	21.7
36		Hidden Canyon Industrial	35.0		35.0	35.0	35.0	35.0	35.0	35.0
2		Tournament Hills Phase 3	7.7			7.7	7.7	7.7	7.7	7.7
(109)		Beaumont Urban Village 282 ac (15% landscaped), previously Mountain Bridge Development	60.0			30.0	60.0	60.0	60.0	60.0
(110)		**Legacy Highlands Site**								
		Commericial/Industrial	36.2		36.2	36.2	36.2	36.2	36.2	36.2
		Active Open Space	47.9			16	32	47.9	47.9	47.9
		Street Medians and sides Landscaping	28.2		14	28.2	28.2	28.2	28.2	28.2
		Total Legacy Highlands Site	112.2		50.2	80.4	96.4	112.2	112.2	112.2
		Fairway Canyon Lift Station	0.2		0.2	0.2	0.2	0.2	0.2	0.2
6		Heartland Olivewood	20.0		20.0	20.0	20.0	20.0	20.0	20.0
		Total Additonal Demands without Tukwet Golf Course	273	0	136	211	257	273	273	273
		Existing 2021 Demands	428							
		Total Existing and Additional Demands	701	428	564	639	685	701	701	701

Table 5-17e is a summary of the projected non-potable water demands for all pressure zones. Table 5-17e also shows the amount of recycled water available from the City of Beaumont's Treatment Plant based on Table 4-4 presented previously and the amount that would be available to supply the Oak Valley and Tukwet Canyon Golf Courses (by subtraction).

Table 5-15, presented previously, shows the golf course annual demand for Oak Valley Greens and Morongo Tukwet respectively to be 587 AFY and 923 AFY respectively. Table 5-18 clearly shows that there is not enough recycled water available (on a yearly basis) from the City of Beaumont's Treatment Plant to meet golf course demands until after 2030 or so, possibly until 2035 (also see Figure 5-5). However, it would be possible to supply some water to the golf courses during the "shoulder months", October through March.

Monthly availability of recycled water and factors affecting the total amount of recycled water available for use is discussed further hereon.

Table 5-17c
Projected Non-potable Water Demand in 2800 Pressure Zone
(New Development Additions)

				Anticipated Year						
City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	2022	2025	2030	2035	2040	2045	Build-out
		New Facilities								
10		Noble Creek TR 29267	11.9		3	6	11.9	11.9	11.9	11.9
40		Beaumont Summit Station (TR 36583) (324 ac)	41.0		5	10	20	30	41.0	41.0
7 & 27		Tuscany Townhomes and Villas (11 ac)	2.3			2.3	2.3	2.3	2.3	2.3
13		Beaumont Commons (4 ac)	0.9				0.9	-0.9	0.9	-0.9
12		Oak Valley Village (50 ac) (15% Landscaped)	11.3		3	11.3	11.3	11.3	11.3	11.3
14		Kirkwood Ranch	10.8			3	7	10.8	10.8	10.8
20		Dowling Orchard Industrial Park remaining Phase (26 ac)	5.2		5.2	5.2	5.2	5.2	5.2	5.2
24		Beaumont Industrial Park (250 ac)	20.0			5	10.0	20.0	20.0	20.0
32		Jerome Taurek TR 31162 (130 ac)	20.0				5	10	20.0	20.0
46		Sundance Corporate Center (13.6 ac) (15% landscaped)	3.0		3.0	3.0	3.0	3.0	3.0	3.0
45		San Gorgonio Village (10.3 ac) (15% Landscaped)	2.3		2.3	2.3	2.3	2.3	2.3	2.3
39		Pacific Scene (Manzanita) , TR32850, Park simlar to adjacent to North	1.2				1.2	1.2	1.2	1.2
26		Potrero Creek Estates (310 ac)	35.0					10	20	35.0
		Subtotal	165	0.0	21.5	48.0	79.9	116.9	149.7	162.9
41		***Legacy Highlands Site***								
		School	21.9					21.9	21.9	21.9
		Active Open Space	16.0				5	10	16.0	16.0
		Street Medians and side Landscaping	28.2				5	10	28.2	28.2
		Total Legacy Highlands	66				10.0	41.9	66.0	66.0
17		***Sundance Additional***								
		Cascade Park Sundance (PA 37)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
		Rec Center, Sunpark Dr (PA-32)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
		Discovery Way Entrance	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
		Tioga Park Rec Center (PA-45)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
		Paseos Planning Areas 30,31,33,34	2.8		2.8	2.8	2.8	2.8	2.8	2.8
		Cherry Ave Landscaping	1.1		1.1	1.1	1.1	1.1	1.1	1.1
		Mary Lane Landscaping	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
		Brookside Landscaping	1.5		1.5	1.5	1.5	1.5	1.5	1.5
		Starlight Landscaping	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
		Total Sundance Additonal	22	16.3	21.6	21.6	21.6	21.6	21.6	21.6
		Subtotal New Developments to be Added	252	16	43	70	112	180	237	251

Table 5-17c (Cont'd)
Projected Non-potable Water Demand in 2800 Pressure Zone
(Existing Conversions)

				Anticipated Year						
City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	2022	2025	2030	2035	2040	2045	Build-out
		Existing Facilities to be Retrofitted:								
	100	Rangle Park	2.0				2.0	2.0	2.0	2.0
	101	Viele St. Park (7th and Viele St.)	0.6				0.6	0.6	0.6	0.6
	102	California and 7th Park	0.8				0.8	0.8	0.8	0.8
	103	Sports Park	51.0			51.0	51.0	51.0	51.0	51.0
	104	San Gorgonio Middle School & Beaumont Adult School (1591 Cherry)	24.4					24.4	24.4	24.4
	105	Noble Creek Park	57.3				57.3	57.3	57.3	57.3
	106	Mountain View Cemetery (Summit Cemetery District), 7.1 acres	17.7					17.7	17.7	17.7
	107	Not used								
	108	Brookside Elementary School	23.8			23.8	23.8	23.8	23.8	23.8
	109	Beaumont Park and Rec 650 Oak Valley Pkwy; Oak Valley Parkway Landscaping	4.3						4.3	4.3
	110	Solera HOA, 1615 Fairway Dr, Community Center and Pool	0.6			0.6	0.6	0.6	0.6	0.6
	111	City of Beaumont Street Landscaping, Cougar Way @ Palm Ave @ 1605 Palm Ct.	0.2			0.2	0.2	0.2	0.2	0.2
	112	City of Beaumont Street Landscaping, Cougar Way @ Quail Summit	0.4			0.4	0.4	0.4	0.4	0.4
	113	City of Beaumont Street Landscaping, Brookside Ave @ Howard Way	0.6			0.6	0.6	0.6	0.6	0.6
	114	Beaumont Sports Park	0.7			0.7	0.7	0.7	0.7	0.7
	115	Not used								
	116	City of Beaumont, 10th St at Orange, Park, W of Pool, Stewart Park	3.9				3.9	3.9	3.9	3.9
	117	City of Beaumont, on Orange N/o 10th St Stewart Park	8.2				8.2	8.2	8.2	8.2
	118	Rcoe-Beaumont Head Start, 600 E 8th St.	3.5				3.5	3.5	3.5	3.5
	119	Palm Elementary School Ath Field; Orange Ave, S/o 8th St	4.3				4.3	4.3	4.3	4.3
	120	SCE Maraschino Sub Sta, 4th & Viele St	2.6					2.6	2.6	2.6
	121	Sundance Community Assn, 1317 Mistletoe Dr, Walkway Easement	0.2						0.2	0.2
	122	City of Beaumont, 70 Seneca Springs Pkwy, Park at Potrero & Senseca Sprgs Pkwy	0.1						0.1	0.1
	123	M&R Beaumont Partners, Oak Valley Towne Center, 1400 Beaumont Ave.	1.5						1.5	1.5
	124	Sundance Community Association, 1107 Periwinkle Ln, Walkway Park	2.6						2.6	2.6
	125	3 Rings Ranch Entrance, end of 8th St.	10.0			10.0	10.0	10.0	10.0	10.0
	126	Rancho Ready Mix	11.0		11.0	11.0	11.0	11.0	11.0	11.0
	127	Highland Academy Charter School	5.0					5.0	5.0	5.0
		Subtotal Existing Facilities to be connected	237		11.0	98.3	178.9	228.6	237.3	237.3
		Total Zone Additional Demand	490	16.3	54.1	167.9	290.5	409.1	474.7	487.8
		Existing 2021 Demands	1436							
		Total Existing and Additional Demands	1926	1452	1490	1604	1726	1845	1911	1924

Table 5-17d
Projected Non-potable Water Demand in 3000 Pressure Zone

City of Beaumont Project No (Index No.)	Non-potable Master Plan Map No.	Project Name or Location	Non-potable Water Demand, AFY	Anticipated Year						
				2022	2025	2030	2035	2040	2045	Build-out
	200	Brookside Street Landscaping	8.6				8.6	9	9	9
	201	Highland Springs South Golf Course	116				116	116	116	116
	202	BCVWD Noble Creek Recharge Site. CV & Beaumont Ave	12.0				12.0	12.0	12.0	12.0
	203	BCVWD Cherry Tank Site	0.9				0.9	0.9	0.9	0.9
	204	Bcv Rec & Park District Cherry Valley Grange	0.8				0.8	0.8	0.8	0.8
		Total Additional Facilities	138				138	138	138	138
		Existing 2021 Demands	0							
		Total Existing and Additional Demands	138	0	0	0	138	138	138	138

Table 5-17e
Summary of Projected Non-potable Water Demands all Pressure Zones

		Anticipated Year/ Values in AFY								Comment
Pressure Zone	Existing (2021) Demand, AFY	2022	2025	2030	2035	2040	2045	Build-out	Peak Demand gpm	
2400	54	54	79	79	79	79	79	79	365	
2600	428	428	564	639	685	701	701	701	3257	
2800	1436	1452	1490	1604	1726	1845	1911	1924	8952	
3000	0	0	0	0	138	138	138	138	247	Includes Highland Spring GC second phase
Total	1918	1934	2133	2321	2628	2762	2828	2841	12822	Not including Tukwet Canyon or Oak Valley Greens.
City of Beaumont Recycled Water Available, AFY		0	1963	2302	2827	3005	3202	6090		From NP Water Master Plan Table 4-4. See Section 4 for discussion regarding recycled water projections at buildout
Recycled Water to Supplement Tukwet & Oak Valley GCs, AFY		-	-	-	199	243	374	3249		

Table 5-18
Recycled Water Available vs. Golf Course Demand For Shoulder Months

		Anticipated Year/ Values in AFY								Comment
Pressure Zone	Existing (2021) Demand, AFY	2022	2025	2030	2035	2040	2045	Build-out	Peak Demand gpm	
City of Beaumont Recycled Water Available, AFY		0	1963	2302	2827	3005	3202	6090		From NP Water Master Plan Table 4-4. See Section 4 for discussion regarding recycled water projections at buildout
Recycled Water to Supplement Tukwet & Oak Valley GCs, AFY		-	-	-	199	243	374	3249		
Tukwet Canyon GC shoulder months only, Oct - Mar, AFY		268	268	268	268	268	268	268		
Oak Valley Greens GC Shoulder months only, Oct - Mar, AFY		195	195	195	195	195	195	195		
GC Totals		463	463	463	463	463	463	463		

Peak Non-potable Water Demands

The projected non-potable water demands for maximum month, maximum day and peak hour, based on the ratios in Table 5-4 for all pressure zones are presented in Tables 5-19a – Table 5-19f below. Demands in the 2600 and 2800 Non-potable Pressure Zones do not include golf course demands (Tukwet Canyon and Oak Valley). Demands for Highland Springs Country Club are included in the 3000 Non-potable Pressure Zone demands.

Table 5-19a
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
2400 Pressure Zone

2400 Pressure Zone							
	2022	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	54	79	79	79	79	79	79
Annual Average, mgd	0.05	0.07	0.07	0.07	0.07	0.07	0.07
Annual Average, gpm	33	49	49	49	49	49	49
Maximum Month							
Max. Month/Ave. Day	1.9						
Max Month, AF	9	13	13	13	13	13	13
Max Month, mgd	0.09	0.13	0.13	0.13	0.13	0.13	0.13
Max Month, gpm	64	93	93	93	93	93	93
Maximum Day							
Max Day/Ave Day	2.5						
Max Day, mgd	0.12	0.18	0.18	0.18	0.18	0.18	0.18
Max Day, gpm	84	122	122	122	122	122	122
Peak							
Peak Demand/Ave Day	7.5						
Peak Demand, mgd	0.36	0.53	0.53	0.53	0.53	0.53	0.53
Peak Demand gpm	251	367	367	367	367	367	367

Table 5-19b
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
2600 Pressure Zone, (Morongo Tukwet Canyon Not Included)

2600 Pressure Zone (No Golf Courses)							
	2022	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	428	564	639	685	701	701	701
Annual Average, mgd	0.38	0.50	0.57	0.61	0.63	0.63	0.63
Annual Average, gpm	265	350	396	425	435	435	435
Maximum Month							
Max. Month/Ave. Day	1.9						
Max Month, AF	68	89	101	108	111	111	111
Max Month, mgd	0.73	0.96	1.08	1.16	1.19	1.19	1.19
Max Month, gpm	504	664	753	807	826	826	826
Maximum Day							
Max Day/Ave Day	2.5						
Max Day, mgd	0.96	1.26	1.43	1.53	1.56	1.56	1.56
Max Day, gpm	663	874	990	1,062	1,086	1,086	1,086
Peak							
Peak Demand/Ave Day	7.5						
Peak Demand, mgd	2.87	3.78	4.28	4.59	4.69	4.69	4.69
Peak Demand gpm	1,990	2,622	2,971	3,185	3,259	3,259	3,259

Table 5-19c
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
2800 Pressure Zone, (Oak Valley Greens Not Included)

2800 Pressure Zone (No Golf Courses)							
	2022	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	1,452	1,490	1,604	1,726	1,845	1,911	1,924
Annual Average, mgd	1.30	1.33	1.43	1.54	1.65	1.71	1.72
Annual Average, gpm	900	924	994	1,070	1,144	1,185	1,193
Maximum Month							
Max. Month/Ave. Day	1.9						
Max Month, AF	230	236	254	273	292	303	305
Max Month, mgd	2.46	2.53	2.72	2.93	3.13	3.24	3.26
Max Month, gpm	1,710	1,755	1,889	2,033	2,173	2,251	2,266
Maximum Day							
Max Day/Ave Day	2.5						
Max Day, mgd	3.24	3.32	3.58	3.85	4.12	4.26	4.29
Max Day, gpm	2,250	2,309	2,486	2,675	2,859	2,961	2,982
Peak							
Peak Demand/Ave Day	7.5						
Peak Demand, mgd	9.72	9.97	10.74	11.55	12.35	12.79	12.88
Peak Demand gpm	6,750	6,927	7,457	8,024	8,577	8,884	8,945

Table 5-19d
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
3000 Pressure Zone, (Highland Springs Golf Course Included)

3000 Pressure Zone (Total Demand, Including Highland Springs Golf Course)							
	2022	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	0	0	0	138	138	138	138
Annual Average, mgd	0.00	0.00	0.00	0.12	0.12	0.12	0.12
Annual Average, gpm	0	0	0	86	86	86	86
Maximum Month							
Max Month, AF	0	0	0	22	22	22	22
Max Month, mgd	0.00	0.00	0.00	0.23	0.23	0.23	0.23
Max Month, gpm	0	0	0	162	162	162	162
Maximum Day							
Max Day, mgd	0.00	0.00	0.00	0.31	0.31	0.31	0.31
Max Day, gpm	0	0	0	214	214	214	214
Peak							
Peak Demand, mgd	0.00	0.00	0.00	0.59	0.59	0.59	0.59
Peak Demand gpm	0	0	0	407	407	407	407

Table 5-19e
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
All Pressure Zones
(Not Including Oak Valley Greens or Morongo Tukwet Golf Courses)

All Pressure Zones (No Oak Valley or Tukwet Golf Courses)							
	2022	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	1,934	2,133	2,322	2,628	2,763	2,829	2,842
Annual Average, mgd	1.73	1.90	2.07	2.35	2.47	2.53	2.54
Annual Average, gpm	1,199	1,322	1,439	1,629	1,713	1,754	1,762
Maximum Month							
Max. Month/Ave. Day	1.9						
Max Month, AF	306	338	368	416	437	448	450
Max Month, mgd	3.28	3.62	3.94	4.46	4.69	4.80	4.82
Max Month, gpm	2,278	2,512	2,735	3,095	3,254	3,332	3,347
Maximum Day							
Max Day/Ave Day	2.5						
Max Day, mgd	4.32	4.76	5.18	5.86	6.17	6.31	6.34
Max Day, gpm	2,997	3,305	3,598	4,073	4,282	4,384	4,404
Peak							
Peak Demand/Ave Day	7.5						
Peak Demand, mgd	12.95	14.28	15.54	17.59	18.50	18.94	19.03
Peak Demand gpm	8,991	9,916	10,795	12,218	12,845	13,152	13,212

Table 5-19f
Projected Maximum Month, Maximum Day and Peak Non-potable Water Demands
2600 and 2400 Pressure Zones,
(Not Including Morongo Tukwet Golf Course)

2600 and 2400 Pressure Zone (No Oak Valley or Tukwet Golf Courses)							
	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**Build-out**
Annual Average							
Annual Average, AFY	482	643	718	764	780	780	780
Annual Average, mgd	0.43	0.57	0.64	0.68	0.70	0.70	0.70
Annual Average, gpm	299	399	445	474	483	483	483
Maximum Month							
Max. Month/Ave. Day	1.9						
Max Month, AF	76	102	114	121	124	124	124
Max Month, mgd	0.82	1.09	1.22	1.30	1.32	1.32	1.32
Max Month, gpm	568	757	846	900	919	919	919
Maximum Day							
Max Day/Ave Day	2.5						
Max Day, mgd	1.08	1.43	1.60	1.70	1.74	1.74	1.74
Max Day, gpm	747	996	1,113	1,184	1,209	1,209	1,209
Peak							
Peak Demand/Ave Day	7.5						
Peak Demand, mgd	3.23	4.30	4.81	5.11	5.22	5.22	5.22
Peak Demand gpm	2,241	2,989	3,338	3,552	3,626	3,626	3,626

Figure 5-5 shows the projected non-potable water demand from 2020 through 2045 along with the amount of recycled water available from the City of Beaumont's Treatment Facility. The habitat maintenance flow and the brine discharge has been accounted form in the amount available.

Figure 5-5
Projected Non-potable Water Demand and Recycled Water Available

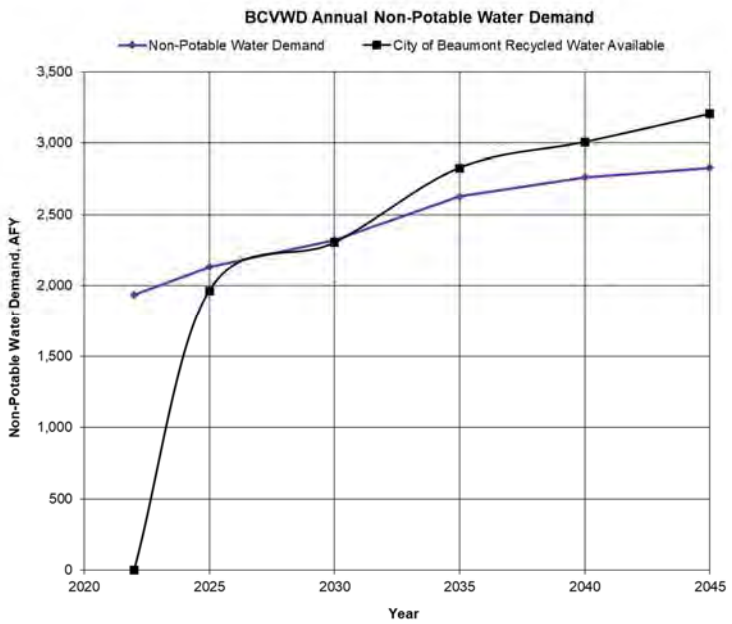


Figure 5-5, presented above, shows that there is some recycled water available to serve Oak Valley Greens and Morongo Tukwet Golf Courses and decrease their demand for potable water.

Monthly Variations

Figure 5-6 shows the monthly variations in the non-potable water demand over time using the monthly average to annual average ratios presented previously in Table 5-4. Figure 5-6 shows the increase in demand, by month, over time from 2022 through build-out. Also, shown in Figure 5-6 is the available recycled water from the City of Beaumont's Treatment Facility. From 2022 through build-out there is not enough recycled water available from the City to meet the monthly demands during the summer, even without the golf courses. During the winter months ("shoulder months"), however there is more than ample recycled water available and could be made available to Oak Valley Greens and Morongo Tukwet Golf Courses during this time.

During the summer, the City's recycled water will need to be supplemented from other sources. These sources were described in Section 4 and consist of:

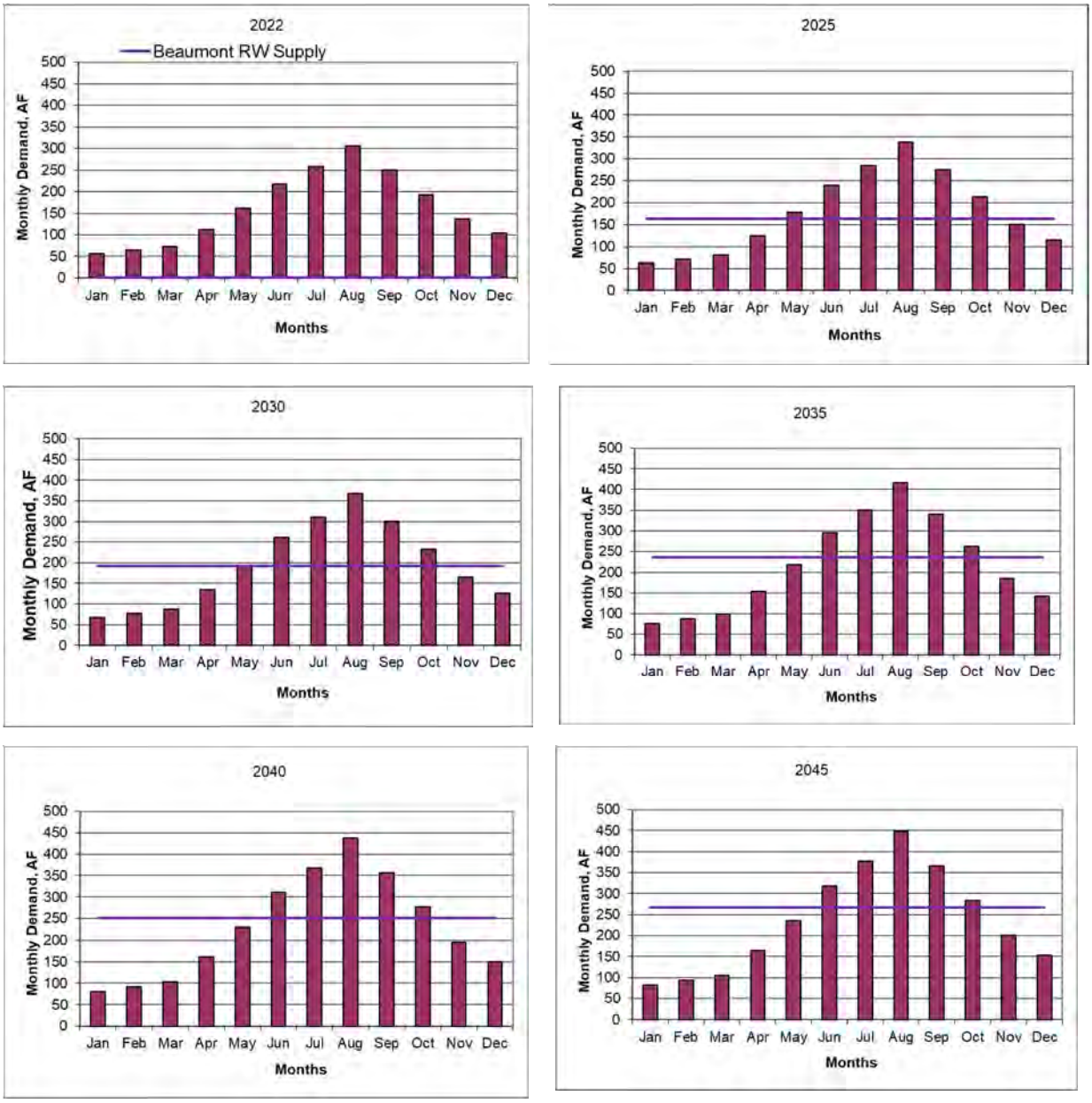
- Non-potable well water (Well No. 26)
- Screened State Project Water when available (potential future project)
- Non-potable, high nitrate, well water from the mouth of Edgar Canyon (potential future project)
- Non-potable water from San Timoteo Creek, high groundwater area, along Oak Valley Parkway, adjacent to Fairway Canyon (potential future project)
- Other recycled water
- Potable well water (last resort)

Recently SCE has changed the time of use (TOU) rates due to solar generation. The new rates are year-round now and are as follows:

- 12:00 am to 8:00 am – Super off-peak (least costly time to operate)
- 8:00 am to 4:00 pm – Off-peak (mid-price time)
- 4:00 pm to 9:00 pm – On-peak (most expensive time to operate)
- 9:00 pm to 12:00 am – Off-peak (mid-price time)

Currently (2021) the non-potable water system is supplied from non-potable Well No. 26 which has a capacity of about 1,300 gpm or 136 AF/month assuming 19 hours of operation (summertime off-peak and super off-peak electrical rates). It is clear from Figure 5-6 that without recycled water, Well No. 26 is not able to keep up with the current summer demands and supplemental water in addition to Well 26 is required. Currently, this is potable groundwater.

Figure 5-6
Monthly Variations in Non-potable Water Demands All Pressure Zones,
(Oak Valley Greens and Morongo Tukwet Golf Courses not Included)



BCVWD has identified a capital project to install fine screens to treat SPW prior to entering the non-potable water system. The screens are necessary to remove particles and debris which could increase maintenance in BCVWD's non-potable water system and the landscape irrigation systems of the end users. BCVWD's 24-in pipeline connection to the EBX and the SGPWA's turnout have a capacity of 34 cfs or about 2,000 AF/month (15,260 gpm). The SPW, when available, can supplement the available recycled water and would be the supplemental water source of first choice since it is primarily a gravity water source.

During normal years of SPW availability, SPW will be used to supplement the non-potable water system and groundwater recharge for replacement obligations and banking; both uses will be going on simultaneously. During years when SPW allocations are reduced, management of the SPW supply will be necessary to ensure that there is availability during the summer months. This will take coordination between BCVWD, SGPWA, and Department of Water Resources. Other State Water Contractors with hydroelectric power generating contracts have managed to take deliveries during the summer months to maximize power generation revenue. Similarly, SGPWA should be able to manage their supply to ensure BCVWD has SPW water during the summer to supplement the non-potable water system rather than use pumped groundwater.

Maximizing Use of Recycled Water and Local Resources

Table 5-20 presents a summary of the recycled water and supplemental water needs to meet the non-potable water demands from 2022 through build-out. The table supports Figure 5-5 and shows there is not enough recycled water available during the summer months to meet the demands, requiring supplemental SPW or non-potable groundwater. Up to 547 AFY of supplemental supply is needed (not including 2022 – recycled water not available). This will change from year to year as hydrologic conditions change in the Pass Area, as existing facilities are converted to non-potable water and new developments are added to the non-potable system, and as new developments add to the City's wastewater flow.

About 70% to just over 80% of the available recycled water is used on an annual basis. Again, this will vary from year to year based on the conditions described above. Table 5-20 also indicates that after 2025 and to 2045 there are between 350 AFY to over 1,000 AFY of recycled water that could be used for other purposes (not including estimated recycled water available at build-out), e.g., irrigating Oak Valley Greens and Morongo Tukwet Golf Courses or provide additional treatment to allow Indirect Potable Reuse (IPR) and maximizing the use of local water resources.

Table 5-20 indicates some potential non-potable water sources that could be implemented to supplement the recycled water during the summer months which would eliminate the need for supplemental SPW or Beaumont Basin Groundwater (that must be replaced) in the non-potable water system. This would also provide more recycled water which could be treated and used for IPR.

Table 5-20
Summary of Recycled Water Use and Supplemental Water
to Non-potable Water System Needed

	2022	2025	2030	2035	2040	2045	Build-out
Monthly Demand, AF (Not Including Tukwet Canyon and Oak Valley Greens)							
Jan	56	62	68	77	81	83	83
Feb	64	71	77	88	92	94	95
Mar	73	80	87	99	104	106	107
Apr	113	124	135	153	161	165	166
May	161	178	194	219	230	236	237
Jun	218	240	261	296	311	318	320
Jul	258	284	310	350	368	377	379
Aug	306	338	368	416	437	448	450
Sep	250	276	300	339	357	365	367
Oct	193	213	232	263	276	283	284
Nov	137	151	164	186	196	200	201
Dec	105	116	126	142	150	153	154
Total, AFY	1,934	2,133	2,322	2,628	2,763	2,829	2,842
Recycled Water Available, AFY	-	1,963	2,302	2,827	3,005	3,202	6,090
Recycled Water Available, AF/M	-	164	192	236	250	267	508
Supplemental Supply Needed, AFY	1,934	547	513	486	498	458	0
Recycled Water Used, AFY	-	1,586	1,809	2,142	2,265	2,371	2,842
% Recycled Water Used	-	81%	79%	76%	75%	74%	47%
Recycled Water for other Purposes, AFY	-	377	493	685	740	831	3,248
Other Potential Supplemental Sources							
Edgar Canyon High NO3, AF/M	-	-	35	35	35	35	35
San Timoteo High GW, AF/M	-	-	150	150	150	150	150
Additional Supplemental Water Needed, AFY	-	547	328	301	313	273	-
Recycled Water Available for other Purposes with Potential Projects, AFY	-	377	678	870	925	1,016	3,433

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Location map(s) showing development and NP Water Sites 11 x 17

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Section 6

Facility Requirements

Section 5 presented the non-potable water demands by pressure zone from 2020 through build-out. These demands are the basis for the design and sizing of the facilities in this Section. Section 5 indicated that summertime demands exceed the supply of recycled water from the City of Beaumont's Wastewater Treatment Plant, so the area's two major golf courses, Oak Valley and Tukwet Canyon are not proposed to be supplied with non-potable water year around. The golf courses have their own wells and use them for irrigation as well as meeting potable water demands. BCVWD envisions the golf courses will use their own wells, but might use non-potable water during the winter, spring, and fall seasons if beneficial and if recycled water is available. There is a benefit to using recycled water since the nitrogen is a nutrient for the grass. [1]

Because there is a surplus of recycled water available during the winter months, facilities are described in this Section to provide additional treatment, if required, and recharge of the recycled water as part of an IPR project with appropriate permits.

BCVWD and the City of Beaumont will comply with the RWQCB's Maximum Benefit TDS requirement of 330 mg/L which is required by the City's Master Water Reclamation Permit. Nitrogen will not be an issue in the non-potable groundwater either, since the Permit requires recycled water to be applied at agronomic rates ensuring that excessive nitrogen will not percolate to the groundwater.

Planning Criteria

Before the master plan facility requirements can be identified, the planning criteria to determine the capacity requirements of the various system components, reservoirs (tanks), transmission mains, pumps, etc., and the size of future facilities must be established. The criteria will also serve to guide developers as they plan their facilities to meet the master plan requirements and the District's ultimate needs.

Non-Potable Water Demands

The water demands were presented in Section 5:

- Annual Average and Maximum Month demands by pressure zone (Tables 5-19a through 5-19f) based on a Maximum Month: Average Annual Demand ratio of 1.9:1

[1] On the basis of 3.6 mg/L total inorganic nitrogen permitted by the RWQCB in the City's effluent, there is about 10 lb N/AF of recycled water with a current value is $4 of N/AF of recycled water. Applying 4 AF water/acre, applies 40 lb N/acre irrigated at a value of $16/acre irrigated.

- Maximum Day Demand (Tables 5-19a through 5-19f) based on a Maximum Day Demand: Average Annual Demand ratio of 2.5:1
- Peak Demand (Tables 5-19a through 5-19f) based on a Peak Demand: Average Annual Demand ratio of 7.5:1. This is equivalent to Peak Demand:Maximum Day ratio of 3:1.

The supporting information for these demands is included in Section 5.

Supplemental Water Requirement

The amount of recycled water available from the City of Beaumont is not sufficient to meet the non-potable water demands during the summer months. A month-by-month analysis of demand and recycled water supply was presented previously in Table 5-20. Table 6-1 shows the amount of supplemental water needed on an annual basis and during the maximum month and maximum day. The annual amounts are from Table 5-20. The maximum month amount can be obtained from Table 5-20 by subtracting the recycled water available from the maximum monthly demand. The maximum day requirement in Table 6-1 is based on the ratio of the maximum day/maximum month (2.5/1.9 = 1.3). Approximately 2,000 gpm to 2,300 gpm of well capacity is needed to supplement the recycled water system on the maximum day assuming 19-hr/day pumping (not including 2022 – entire Non-potable system is currently served by the Potable system).

This supplemental supply would normally be either imported SPW or non-potable groundwater. In emergencies, potable water can be used to supplement the recycled water. There is an air gap connection provided to add potable water to the 2800 Zone Non-Potable tank.

Table 6-1
Supplemental Water Requirements to Non-potable Water System (2800 NP Zone)

Demand Condition	Year						
	2021	2025	2030	2035	2040	2045	Build-out
Annual Requirement, AFY (Table 5-20)	1,934	547	513	489	498	458	-
Maximum Month, AF/month (gpm)	306 (2,310)	174 (1,313)	176 (1,326)	181 (1,362)	187 (1,411)	181 (1,366)	-
Maximum Day, mgd (gpm)	4.32 (3,002)[1]	2.46 (1,707)	2.48 (1,724)	2.55 (1,770)	2.64 (1,834)	2.56 (1,776)	-
Maximum Day, 19-hr pumping, gpm	3,793	2,157	2,178	2,236	2,317	2,243	-

(1) Current Demand is served by both the 2800 Non-Potable Zone and and the Potable 2650, 2520, and 2370 Zone

Imported Water

Imported water may be used to supplement recycled water when it is available; however, it should be treated with a fine screen system to remove debris and algae that may impact the operation of irrigation systems. A screening facility project is included in this Master Plan and is described later in this section.

Groundwater

Well 26 is currently the primary source of groundwater to supplement the recycled water. In future years, there are Master Planned projects to use non-potable groundwater from the mouth of Edgar Canyon and/or from San Timoteo Creek. These projects are described later in this section and, once constructed, would be the primary sources of non-potable water since these sources are not subject to BCVWD's Adjudication replacement obligations. Well 26 and imported water would then be back-ups for the non-potable groundwater from these sources.

Water Storage

Water storage for non-potable water systems must be sufficient to provide operational storage to meet peak demands and have some emergency reserve for unforeseen conditions. Fire suppression using non-potable water, although allowed by Title 22 and used by other agencies, is not proposed at this time.[2]

- Operational Storage (sometimes called "diurnal" or "equalization" storage) is needed to meet the peak demands, provide water during times when groundwater wells and booster pumps are not operating, and account for hourly variations in recycled water production[3].
- Emergency Storage to provide water under unexpected conditions and to account for differences in demand patterns that can occur from day to day. Standby power is not proposed to be installed for non-potable booster pumps and wells. It is anticipated that irrigation water usage would be curtailed during extended power outages.

Operational Storage

The amount of operational storage depends on the recycled water supply, including supplemental water, and the demand pattern. Non-potable system supply wells in the Beaumont Basin and non-potable water booster pumps are high horsepower and are on SCE's Time of Use (TOU-8) rate schedule. Table 6-2 shows the summer and winter hours for SCE's TOU-8

[2] WateReuse, Los Angeles (undated). Using Recycled Water for Firefighting. Developed for the Los Angeles Chapter of the WateReuse Association.

[3] The City of Beaumont is providing flow equalization as part of the treatment process train. To provide for operational adjustments, a small variation in recycled water production is incorporated into the analysis to be conservative.

rate schedule. Note there is no “on peak” time in the winter. To determine operational storage requirements, non-potable system supply wells and non-potable water booster pumps are assumed to not operate from 4 pm to 9 pm during the summer (June 1 through September 30).

An analysis was performed for the 2800 NP Zone, using the new SCE Time of Use Rate Schedule, to determine the impact Pattern 1, Pattern 2, and the Simplified Demand Pattern, shown in Section 5, Figures 5-3 and 5-4, would have on the operational storage requirements. The results showed the following:

Supply Condition	Storage as a % of the Total Daily Demand		
	Demand Pattern 1	Demand Pattern 2	Simplified Pattern
Off 4 pm to 9 pm (19 hr pumping)	43%	55%	54%

Demand Pattern 2 has just 1% more storage required than the Simplified Pattern; both are significantly more than Demand Pattern 1. For design purposes, the Simplified Demand Pattern and 54% of the maximum daily non-potable water demand, are reasonable to use to determine the operational storage requirements. Future master plans should re-evaluate the patterns and adjust the storage requirements appropriately.

Table 6-2
SCE TOU-8 Electrical Rate Periods

Rate Period	Weekdays	Weekends and Holidays
Summer June 1 to September 30		
Mid-night to 4 pm	Off-peak	Off-peak
4 pm to 9 pm	On-peak	Mid-peak
9 pm to Mid-night	Off-peak	Off-peak
Winter October 1 to May 31		
Mid-night to 8 am	Off-peak	Off-peak
8 am to 4 pm	Super-off peak	Super-off peak
4 pm to 9 pm	Mid-peak	Mid-peak
9 pm to Mid-night	Off-peak	Off-peak

A separate analysis of the 3000 NP Zone was made using the simplified irrigation demand pattern for general landscape irrigation and assuming the Highland Springs Golf Course (South) would have their lakes replenished during the daytime hours only. The resulting recycled water operational storage for the 3000 NP Zone was 43% of the total daily demand.

Emergency Storage

Some emergency storage should be provided to account for variations in the diurnal pattern and provide time to respond to any non-potable water source or system outage. This volume should be over and above the "dead storage" in the non-potable water storage tank below the invert of the outlet pipe.

Emergency storage in recycled water master planning studies prepared for other agencies ranges from 10 percent of the required operational storage to 100% of the maximum day demand. BCVWD believes that 100% of the maximum day demand is excessive considering BCVWD has alternative supplies for the non-potable system including groundwater and imported SPW. Since the non-potable water system only supplies irrigation water, should there be an emergency, irrigation demands could easily be curtailed or reduced until the recycled supply can be returned to service. For planning purposes, BCVWD will provide an additional 10% of the required operational storage for emergencies. The allowance can be re-evaluated in future updates to this master plan.

To determine the appropriate size for a water storage tank, the "dead storage" volume must be considered. "Dead storage" is the volume of water below the inlet/outlet pipe for the tank. BCVWD's tanks have side outlets, slightly above the tank bottom. BCVWD's existing 2800 Zone Non-potable water tank has dimensions and characteristics shown in Table 6-3.

Table 6-3
Existing 2800 Zone Non-potable Water Tank Characteristics

Diameter	150 ft
Volume	2.11 MG
Shell Height	16 ft
Floor Elevation	2795.00
Overflow Elevation	2811.00
Centerline 24-in Inlet& Outlet Pipes	2797.50 (2.5 ft above floor)
Volume/ft height	131,875 gal
Volume at Outlet Invert Elevation	197,812 gal, (based on 1.5 ft), (use 200,000 gal)

An allowance of 200,000 gallons of "dead storage" will be added to the emergency storage and operational storage requirements when determining total storage tank volume. The required operational storage is 54% of the maximum day demand; so, 10% of the required operational storage would be 5.4% of the maximum day demand and would provide about 1.5 hr of "response time" on a maximum day.

Transmission and Distribution Mains

Master planning criteria for transmission and distribution mains are presented in Table 6-4. Distribution system pressures shall be as shown in Table 6-5.

Table 6-4
Non-Potable Transmission and Distribution Piping Planning Criteria

Distribution Mains	
Diameter	6 in (minimum), 8, and 12 in
Material	Cement mortar lined ductile iron
Maximum Velocity	7.5 ft/sec
Hazen-Williams C	140
Corrosion Protection and Labeling	Polyethylene bagging all locations
Transmission Mains	
Diameter	16, 18, 20, 24, 30, 36 inches
Material	Cement mortar lined ductile iron
Maximum Velocity	7.5 ft/sec
Maximum Headloss	5 ft/1000 ft
Hazen-Williams C	140
Corrosion Protection and Labeling	Polyethylene bagging all locations

Table 6-5
Non-Potable Water Distribution System Operating Pressure Planning Criteria

Operating Condition	Pressure
Maximum	120 psi
Design Maximum	80 psi
Normal Minimum at Peak Demand	40 psi

Booster Pumping

Booster pumping stations shall be designed to provide the maximum day demand in the pressure zone directly served by the booster pump plus any non-potable water needs in higher or lower elevation pressure zones served by the booster pump station. Booster pumps shall operate only during mid-peak and off-peak hours, (maximum of 19 hours per day), similar to the wells. Pump stations will have a minimum of two pumps, one duty/one standby, and may be constant or variable speed depending on the size. Pumps will be started and stopped based on water level in the pressure zone reservoir and controlled through the District's SCADA System. Stand-by power is generally not required for non-potable water systems serving only irrigation systems.

Pressure Regulating Stations

Pressure regulating stations, serving pressure zones with tanks, shall be designed to meet the maximum day demand of the lower pressure zone plus the maximum day demand of any additional lower pressure zones served through the pressure regulator. A rate of flow control option may be needed to limit the flow to the maximum day demand. For those pressure zones which do not have tank storage, the pressure regulating stations shall be capable of meeting the peak hour demand.

One pressure regulator shall be sized to meet the minimum demand. There shall be at least two regulators in each station; some pressure regulating stations may need three or more depending on the range of flows expected. The regulators shall be set to open at sequentially lower downstream pressures with smallest regulator opening first, and the largest regulator, last.

Pressure regulating stations will be constructed above ground and within public or dedicated rights-of-way, wherever possible, and shall be fenced to match the surroundings and have vehicle access and parking. The District does operate and maintain existing potable pressure regulating stations within underground vaults; this is not the preferential location, however if there is limited land availability to locate a station, the District may consider constructing an underground (in a vault) pressure regulating station.

Master Plan Facilities

The non-potable water master plan facilities will be designed and staged to meet current and future demands, to build-out. The facilities are presented by pressure zone, beginning with the 2800 Non-potable Pressure Zone. Facilities required to serve the 3000 Non-potable Pressure Zone are described at the end of this sub-section. Facilities required to be constructed by the City of Beaumont at their wastewater treatment facilities are not discussed in this Master Plan. The City is responsible for facilities to meet the influent flow projections and effluent and recycled water quality requirements.

2800 Non-potable Pressure Zone

The 2800 Non-potable pressure zone is proposed to receive the recycled water from the City of Beaumont and currently is being supplied by supplemental groundwater or imported SPW needed to meet summer-time peak demands. The 2800 Non-potable Zone is proposed to supply the 2400 and 2600 NP Pressure Zones through pressure regulating stations and the 3000 NP Pressure Zone through a booster pumping station.

NP Water Demands

The non-potable water demands supplied to and by the 2800 Non-potable Pressure Zone and associated zones are shown in Table 6-6 (summary of Tables 5-19a – 5-19f).

In Table 6- 6 the following assumptions are made:

- 3000 Zone serving Highland Springs Golf Course would not be constructed until 2035. Demands in 2800 Zone do not include the 3000 Zone demands until 2035.
- No supply will be provided for golf course irrigation in 2800 (Oak Valley) or 2600 Zones (Morongo Tukwet) except during the “shoulder months” October 1 through March 31 when recycled water is available. Golf course water demands during the shoulder months total 268 AFY for Morongo Tukwet (29% of 10-year average annual) and 195 AFY for Oak Valley (33% of 10-year average annual), totaling 463 AFY. Peak lake/water hazard replenishment rates during the “shoulder months” are 1,950 gpm for Oak Valley Greens and 2,550 gpm for Morongo Tukwet Golf Courses.

Recycled Water Available from the City of Beaumont

Recycled Water from the City of Beaumont’s WWTP is the principal source of non-potable water supply for BCVWD’s non-potable system. This supply is not sufficient to meet the maximum day demands during the summer month; so supplemental supply is required: screened SPW, non-potable and/or potable groundwater, or potable groundwater (last resort). The City’s recycled water will be pumped into the non-potable zone from a Booster Pumping Station on City-owned property, adjacent to the WWTP. Recycled water available from the City of Beaumont’s WWTP was presented in Section 4, Table 4-4, and is summarized here in Table 6-7 for convenience. The amounts available include deductions for habitat mitigation flow, brine discharges, and on-site recycled water use by the City.

Table 6-6
Demands in (and supplied by) the 2800 Non-potable Water Zone

	2021	2025	2030	2035	2040	2045	Build-out
3000 Zone w/ HS GC (year 2035)							
Average Annual, AFY	0	0	0	138	138	138	138
Average Annual, mgd	0	0	0	0.12	0.12	0.12	0.12
Maximum Day, mgd	0	0	0	0.31	0.31	0.31	0.31
Maximum Day, gpm	0	0	0	214	214	214	214
Peak, gpm	0	0	0	407	407	407	407
2800 Zone, no GCs							
Average Annual, AFY	1,452	1,490	1,604	1,726	1,845	1,911	1,924
Average Annual, mgd	1.30	1.33	1.43	1.54	1.65	1.71	1.72
Maximum Day, mgd	3.24	3.32	3.58	3.85	4.12	4.26	4.29
Maximum Day, gpm	2,250	2,309	2,486	2,675	2,859	2,961	2,982
Peak gpm	6,750	6,927	7,457	8,024	8,577	8,884	8,945
2600 Zone and Below, No GCs							
Average Annual, AFY	482	643	718	764	780	780	780
Average Annual, mgd	0.43	0.57	0.64	0.68	0.70	0.70	0.70
Maximum Day, mgd	1.08	1.43	1.60	1.70	1.74	1.74	1.74
Maximum Day, gpm	747	996	1,113	1,184	1,209	1,209	1,209
Peak, gpm	2,241	2,989	3,338	3,552	3,626	3,626	3,626
Total All Zones							
Total Average Annual, AFY	1,934	2,133	2,322	2,628	2,763	2,829	2,842
Total Average Annual, mgd	1.73	1.90	2.07	2.35	2.47	2.53	2.54
Total Max. Day, mgd	4.32	4.76	5.18	5.86	6.17	6.31	6.34
Total Max Day, gpm	2,997	3,305	3,598	4,073	4,282	4,384	4,404
Total Peak, gpm	8,991	9,916	10,795	12,218	12,845	13,152	13,212

1 Assumes 3000 Zone and HS Golf Course (South) supplied in 2035; peak lake replenishment rate for HS Golf Course (South) is estimated to be 305 gpm maximum.

Table 6-7
Recycled Water Available from City of Beaumont WWTP [4]

	2022	2025	2030	2035	2040	2045	Build-out
Amount of Recycled Water Available from City of Beaumont, mgd	-	1.75	2.06	2.52	2.68	2.86	5.44
Amount of Recycled Water Available from City of Beaumont, gpm, 19 hr of pumping	-	1,540	1,810	2,827	3,005	3,202	6,090

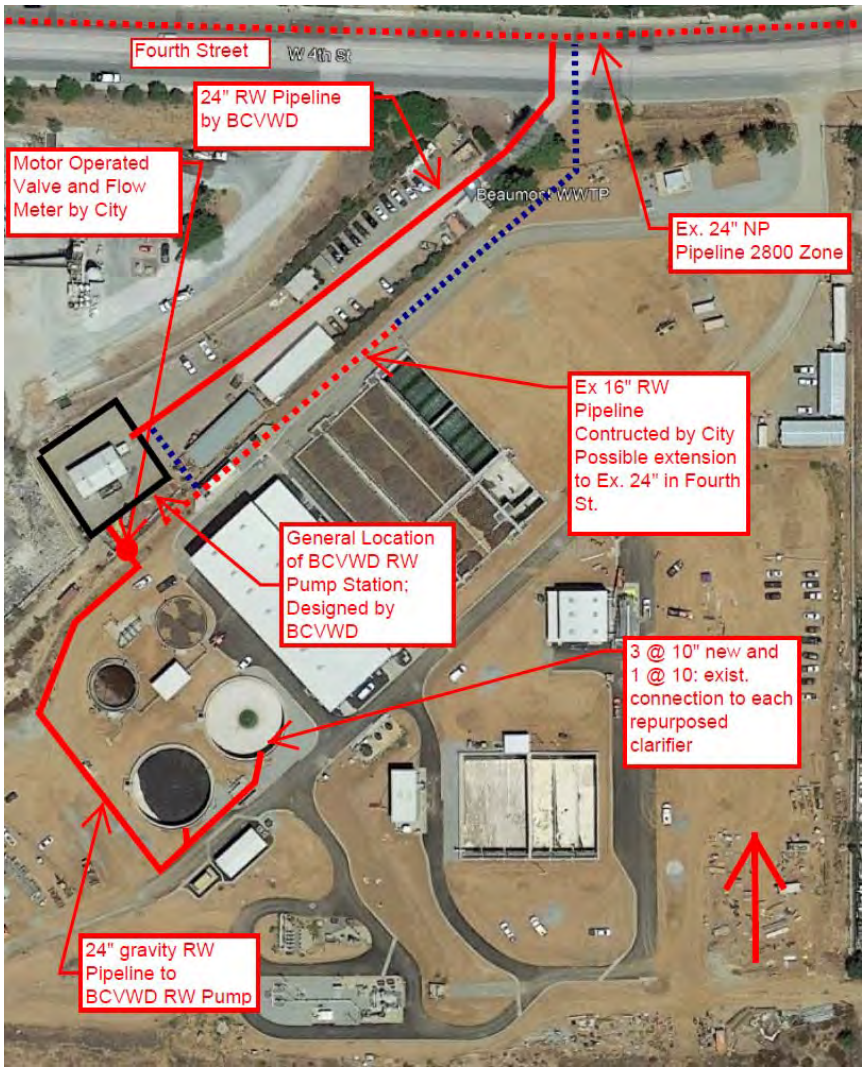
Comparing Tables 6-6 and 6-7, on an annual basis, the City of Beaumont's WWTP will provide less recycled water than the average annual non-potable water demand until sometime after 2030; the non-potable system will require supplemental water to meet peak demands in the summertime. Since the recycled amount in Table 6-7 represents the amount available, this would represent the maximum amount that could be pumped by the recycled water booster pump station.

City of Beaumont WWTP to 2800 NP Pressure Zone Booster Pump Station

The disinfected effluent from the Ultraviolet Light Disinfection System (UV Disinfection) at the City of Beaumont's new WWTP flows to a "Reuse Splitter Box" where a part of the treated effluent is discharged to Coopers Creek (1.8 mgd) for mandated habitat mitigation with the remainder (currently about 2 mgd) pumped to two repurposed clarifiers serving as equalization storage reservoirs at the WWTP. Recycled water from the repurposed clarifiers flows by gravity to a flow metering station and then to the proposed BCVWD recycled water booster pumps station located on a tentative site on City-owned land shown in Figure 6-1. The elevation of the HGL at this location is estimated to be about 2520, though this will need to be verified during design.

[4] Extracted from Table 4-4 presented previously in Section 4.

Figure 6-1
City of Beaumont WWTP and Location for BCVWD 2800 NP Zone RW Booster Pump Station



The treated effluent from the City's WWTP will be pumped to an existing 24-in 2800 Zone, non-potable water pipeline in Fourth St. as shown in Figure 6-1, above. The existing 24-in pipeline in Fourth St. extends east to California Ave. and ultimately to the 2800 NP Zone tank. That same existing 24-in 2800 NP Zone pipeline currently extends west in Fourth St. to the westerly boundary of the Amazon Property (Prosperity Lane). This is the approximate "boundary" between the 2800 Non-potable Pressure Zone and the 2600 Non-potable Pressure Zone. There are two options for the Booster Pump Station discharge pipeline:

- Use the City's 16-in diameter recycled water pipeline, a portion of which was constructed on the WWTP site and extend that north, through the WWTP site to Fourth St. and connect to the existing 24-in non-potable pipeline in Fourth St. This pipeline will not be adequate for ultimate buildout and will need to be supplemented. In the future when

demands dictate, construct a parallel pipeline (18-in or larger) pipeline on the City-owned parcel to Fourth St. as shown in Figure 6-1 above.

- Install a 24-in diameter pipeline on the City-owned parcel to Fourth St. as shown in Figure 6-1 above, and connect to the 24-in non-potable pipeline.

The selected alternative will be determined during the detailed design of the Booster Pump Station.

Alternative Recycled Water Booster Pump Station Configurations

The location of the Recycled Water Booster Pumping Station, near the boundary of the 2800/2600 Non-potable Pressure Zones, provides an option of constructing a separate booster pump set to pump to the 2600 NP Zone in the future when a 2600 NP Zone tank can be constructed. Constructing a 2600 NP Zone Booster Pump Station would reduce the amount of recycled water pumped to the 2800 NP Zone and reduce overall energy costs. But whether the long-term energy cost savings would offset the cost of the additional 2600 NP Zone Pumping Station was evaluated.

BCVWD prepared a Technical Memorandum Rev. 2 (TM) dated October 20, 2021 which evaluated the alternatives. The TM is summarized below.

Two Alternatives were considered.

- **Alternative 1** – Construct separate booster pump stations for the 2600 and 2800 NP Pressure Zones at the Booster Pump Station Site adjacent to the City's WWTP
- **Alternative 2** – Construct a single 2800 NP Zone Booster Pump Station at the site adjacent to the City's WWTP and boost all recycled water into the 2800 Zone Tank(s); serve the 2600 and 2400 NP Zones through pressure regulators.

The study consisted of an evaluation of the capital and operating costs (primarily electric power costs) for the two alternatives. The criteria for evaluation consisted of:

- Evaluation period: 25 years
- Interest rate: 2.5%
- January 2021 costs
- Electric power cost: $0.13/kWh[5]
- Booster Pump Stations will have sodium hypochlorite chemical feed for water quality purposes
- The use of recycled water will increase over the 25-year period. To accommodate the increases in pumping rates and electric power costs over time, the present value of

[5] per recycled water cost memo "Cost for Recycled Water for Raftelis Rate Study" July 17, 2019

power costs will be determined in 5-year increments, with the costs brought back to the current value.

There were some common elements:

- A 2800 NP Zone to 2600 NP Zone pressure regulator at the end of the existing 2800 Zone NP pipeline in Fourth St., near the Amazon Facility, is common to both alternatives. In Alternative 1, it would be installed and operated continuously until a 2600 NP Zone Tank is installed; at that time the pressure regulator would serve as a standby; in Alternative 2, the pressure regulator would always operate in "duty" mode even if a 2600 NP Zone Tank is constructed.
- Pipeline from 2800 NP Zone Booster Pumps to Fourth St. to connect to the 2800 Non-potable Zone 24-in main or the 16-in pipeline on the City's WWTP site and any future supplementary pipeline would always be required.
- 2600 NP Zone pipeline extending westward from the Amazon Facility to Potrero Blvd. is common to both alternatives and is part of the Master Plan facilities to serve the 2600 NP Zone.
- The year 2045 supply was used for sizing the pump stations.

The cost for the pump stations includes the cost of construction, contingencies, and "soft costs" for design, inspection, etc. Land costs were not included as it is assumed the City will provide a long-term lease to BCVWD for a nominal cost. Pump station construction costs were based on the costs used in BCVWD's 2016 Potable Water Master Plan updated to January 2021 costs (ENR CCI National Average, 11,626). Pump station costs were based on firm capacity, with 2 duty pumps and 1 standby pump. Pipeline costs were based on $14/inch diameter/ft length for installation in paved streets.

In the cost comparison, the operating cost only considered electric power cost. Since the pump stations are on the same site, the labor cost associated with daily checkouts, etc. will be essentially the same for either Alternative 1 or Alternative 2.

The facility requirements more specifically were as follows:

Alternative 1 – Separate 2600 NP Zone Pump Station

- Installation of 5,900 ft of 18-in diameter pipeline extending from the 2600 NP Zone Booster Pumps north to Fourth St, then west in Fourth St. to the west end of the Amazon Facility. The 18-in pipeline would parallel the existing 24-in 2800 Zone NP Zone pipeline. (The 18-in main would ultimately be extended in Fourth St. from the Amazon Facility to Potrero Blvd as part of the 2600 Non-potable Zone. This latter extension is common to all alternatives and is a Master Plan pipeline.)
- A 2600 Zone Booster Pump Station with 2 duty /1 standby pumps, 1,100 gpm, 100 ft TDH, 20 HP each, vertical turbine can boosters.

- A 2800 Zone Booster Pump Station with 2 duty /1 standby pumps, 900 gpm, 320 ft TDH, 125 HP each, vertical turbine can boosters.

Alternative 2 – Single 2800 NP Zone Pump Station

- A 2800 Zone Booster Pump Station with 2 duty /1 standby pumps, 1 @ 1,000 gpm, 125 HP, 2 @ 1,500 gpm, 200 HP each, 320 ft TDH all pumps, vertical turbine can boosters

Summary of the Analysis

Table 6-8 presents a summary of the present worth analysis of the alternatives.

Table 6-8
Present Worth Comparison of Pumping Alternatives

	Alternative 1	Alternative 2
	2600 Zone and 2800 Zone Boosters	Pump All Non-potable Demand to 2800 Zone
Capital Cost	$ 8,613,273	$ 5,504,201
Total Present Worth of Annual Power Cost	$1,862,576	$2,416,505
Total Present Cost	**$ 10,475,850**	**$ 7,920,706**

Alternative 2, the single 2800 NP Zone pump station was the least costly alternative by about $2.5 million. The principal cost factors were the second pump station and the lengthy additional pipe in Alternative 1. Although the electric power costs are higher in Alternative 2, ($2.4 million vs. $1.9 million), this was not sufficient to offset the additional construction costs. As a result, only a single 2800 NP Zone pump station will be constructed and all of the recycled water will be pumped to the 2800 NP Zone and regulated down to the 2600 NP Zone or boosted to the 3000 NP Zone. The 2400 NP Zone will be served through a 2600 to 2400 NP Zone Pressure Regulating Station.

Note, total costs presented in Table 6-8 are for reference and discussion only; estimated costs based on recent cost analyses are presented in Section 7.

2800 NP Zone Booster Pump Station Design Parameters

Table 6-9 summarizes the amount of recycled water available from the City's WWTP 2020 through build-out along with the2800 NP Zone Booster Pump Station design capacity and staging through build-out based on pumping 19 hours per day.

The Booster Pump Station will be vertical can-booster type, with 4 pump "cans"; only 3 pumps will be installed initially. A building to house electrical, controls, and hypochlorite feed system will be provided. Pumps will not be enclosed in a building. A hydropneumatics surge chamber may be needed. The facility will be fenced and a small emergency generator or battery backup

for SCADA controls and site lighting will be provided. The hypochlorite feed system will be capable of dosing 10 mg/L free chlorine using either sodium or calcium hypochlorite.

Table 6-9
2800 NP Zone Booster Pump Station Design Requirements

	2022	2025	2030	2035	2040	2045	Build-out
Amount of Recycled Water Available from City of Beaumont, mgd	-	1.75	2.06	2.52	2.68	2.86	5.44
Amount of Recycled Water Available from City of Beaumont, gpm, 19 hr of pumping	-	1,540	1,810	2,827	3,005	3,202	6,090
Pump Capacity, Total Head, and HP	3 @ 1,000 gpm, 320 ft, 125 HP, 2 Duty/1Standby, 2,000 gpm firm capacity, variable speed			4 @ 1,000 gpm, 320 ft, 125 HP, 3 Duty/1Standby, 3,000 gpm firm capacity, variable speed			See Text Below

The treated recycled water effluent flow rate from the treatment process will not vary much over the day because the City is providing flow equalization upstream of the membrane process**.** Initially, two booster pumps will operate in a variable speed mode at about 750 to 800 gpm or about 75 to 80% of capacity. Over time the rate will increase to about 93% of full capacity (2030). At that point, a fourth pump will be added, also variable speed. Three duty pumps will be operating at about 75% capacity increasing to 93% capacity at build-out. The variable speed pumps will reduce the electrical start-up loads and reduce the surge potential.

Sometime after 2045, the booster pump station will need to be upsized to accommodate the amount of recycled water available from the City of Beaumont, generated by the buildout population as presented in Section 3. This Master Plan utilizes the City's projected population density and land use plan from the most recent General Plan (December 2020). The actual firm capacity required for the booster pump station will continue to be evaluated as further development occurs in the City.

During the design process, District will likely size the pump cans such that larger motors can replace the pumps as identified in Table 6-9

Storage Facilities

2800 NP Zone Tank (No 2600 NP Zone Tank)

A spreadsheet model to determine appropriate recycled water storage capacity needed from 2022 to build-out was developed based on projections of wastewater flow and available recycled water from the City of Beaumont (Section 4, Table 4-4) and BCVWD's recycled water demands (Section 5, Tables 5-19a through 5-19f). The City of Beaumont provides flow

equalization upstream of the new MBR process as discussed in Section 4. However, maintaining a perfect steady average flow is difficult; so, to provide a factor of safety, a 15% peaking factor was applied to the average flow to develop an adjusted effluent flow hydrograph for the spreadsheet model. This was presented previously in Section 4, Figure 4-4.

The model included the storage provided by the City of Beaumont (two repurposed clarifiers with a total of 1.1 MG of storage) and assumed the first 1.8 mgd of the day's recycled water would be discharged to Cooper's Creek to meet required habitat mitigation. Hourly flows greater than 1.8 mgd would be pumped by the City's pumps to the repurposed clarifiers and ultimately pumped to the 2800 NP Zone Tank by BCVWD's Booster Pump Station. The Simplified Demand Curve, shown in Section 5, Figure 5-4 was used to model the non-potable water demand during the day.

An hour-by-hour analysis of pumping from the City's WWTP Reuse Splitter Box to the repurposed clarifiers and pumping from the repurposed clarifiers by the 2800 NP Booster Pumps to the 2800 NP Zone Tank was modeled. Pumping to the 2800 NP Zone Tank was limited to 19 hours per day to avoid the on-peak pumping rates.

The storage analysis was performed for a maximum day demand, supplemented with groundwater as necessary. Groundwater pumping was also limited to 19 hours per day to avoid on-peak pumping.

Table 6-10 shows the operational, emergency, and total storage requirements for the 2800 NP Zone to build-out assuming that the only non-potable water storage will be in the 2800 NP Zone.

Table 6-10
Storage Required in 2800 Non-potable Water Pressure Zone
All Zones Supplied; 3000 Zone & HSGC in year 2035

	2021	2025	2030	2035	2040	2045	Buildout
Operational Storage, MG	2.32	2.56	2.79	3.15	3.32	3.39	3.41
Emergency and Dead Storage, MG	0.43	0.46	0.48	0.52	0.53	0.54	0.54
Total Storage Required, MG	2.75	3.01	3.27	3.67	3.85	3.93	3.95
Existing Storage, MG	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Additional 2 MG Tank in 2025		2.0	2.0	2.0	2.0	2.0	2.0
Total Storage Provided, MG	2.0	4.0	4.0	4.0	4.0	4.0	4.0

If recycled water was currently supplied, the current storage (2022) in the 2800 NP Zone would be inadequate for the operational storage required for the maximum day demand. However, due

to the fact that the 2400 and 2600 Zones are supplied by the Potable water system, and the 2800 Zone is supplemented by the Potable water system, this is not currently an issue. Once recycled water becomes available from the City of Beaumont, it is possible that operation of the 2800 NP Zone Booster Pumps or supplemental water from wells may be needed during on-peak hours on some of the high demand days in summer to meet the demands

Projections indicate that by 2025 (the District anticipates securing recycled water from the City of Beaumont prior to 2025), the existing 2 MG of storage will not meet the operational storage requirements to meet the maximum day demand and a second 2 MG storage tank should be constructed. There is space available as a second tank was anticipated when the first tank was constructed in 2009. This will bring the total storage to 4 MG which should be adequate for build-out. It is believed that the non-potable irrigation demand may decrease over time as turf grass is eliminated from street medians and other places which would reduce the demand over time.

2800 NP Zone Storage (With 2600 NP Zone Tank)

There is a possibility that a 2600 NP Zone Tank may be installed in the future. The optimum location would be south of CA-60 as most of the demand is in this area. This tank would be supplied through pressure regulators from the 2800 NP Zone. This would have the effect of reducing the storage in the 2800 NP Zone provided the rate of flow from the 2800 NP Zone to the 2600 Zone is limited to the average on the maximum day rather than the peak demand. The future 3000 NP Zone and Highland Springs GC (South) would still be supplied from the 2800 NP Zone Tank.

A spreadsheet model was developed for the 2800 NP Zone supplying the 2600 NP Zone (including the 2400 NP Zone demands) through a pressure regulator with a rate of flow controller. The storage requirements for the 2600 NP Zone Tank are discussed later in this section when the 2600 NP Zone facilities are presented.

The results of the spreadsheet model indicated that the total build-out storage in the 2800 NP Zone would be reduced to 2.73 MG, rounded to 3 MG. However, it is unlikely that the 2600 NP Zone tank would be constructed in time to avoid constructing a second 2 MG 2800 NP Zone Tank, scheduled for 2025 or at the latest 2030.

A 1 MG 2800 NP Zone Tank could be constructed in 2025, but this would only provide capacity to about 2030 or 2035 when a decision to construct another 1 MG 2800 NP Zone Tank or the 2600 NP Zone Tank (1.5 MG) would have to be made.

For this Master Plan, it is assumed that a 2 MG 2800 NP Zone tank will be constructed in 2025 as it is unlikely the 2600 NP Zone Tank would be constructed before 2035.

Pressure Regulator Facilities

Pressure regulators will be installed in the 2800 Zone to serve the 2600 NP Zone and the 2400 NP Zone below it. Table 6-11 shows the demands in the 2600 and 2400 NP Zones without golf

courses. In Table 6-11, the minimum demand is assumed to be 1/3 of the average annual demand (rounded). Table 6-11 also shows the pressure regulator sizes.

The pressure regulator facilities in the vicinity of Deodar Dr. and in Fourth St. at the Amazon Site to operate with small low flow valves operating continuously to maintain circulation. Larger valves to open in tandem to balance flows at the two locations.

The regulator stations will be adequate to serve the Tukwet Canyon Golf Course since the golf course will not be supplied during the peak summer months.

The pressure regulator at the 2600 NP Zone Tank Site would be installed when the 2600 Zone NP Tank is constructed, about 2030 or 2035; the 2600 NP Zone Tank would be filled from the 2800 NP Zone through a pressure regulator with a rate of flow control system to limit the maximum flow rate to the maximum day demand and preclude “peaking”.

Table 6-11
Non-potable Water Demands in 2600 and 2400 NP Zone
(from Table 5-19f)

	2021	2025	2030	2035	2040	2045	Build-out
Average Annual, AFY	482	643	718	764	780	780	780
Average , gpm	299	399	445	474	483	483	483
Maximum Day, mgd	1.08	1.43	1.60	1.70	1.74	1.74	1.74
Maximum Day, gpm	747	996	1,113	1,184	1,209	1,209	1,209
Peak Demand, gpm	2,241	2,989	3,338	3,552	3,626	3,626	3,626
Minimum Demand, gpm	99	132	147	156	160	160	160
2600 Zone Pressure Regulating Stations (2800 NP Zone to 2600 NP Zone)							
Pressure Regulator at I-10 Bore vicinity Deodar Dr. (Site El 2500, Inlet 130 psi, outlet 43 psi)	1 @ 3”, 2 @ 6”, capacity = 4,060 gpm						
Pressure Regulator in 4th St. at Amazon Facility (Site El 2490, Inlet 130 psi, outlet 48 psi)	1 @ 3”, 2 @ 6”, capacity = 4,060 gpm						
Pressure Regulator at 2600 Zone NP Tank (Site El 2580, Inlet psi, outlet 48 psi, Max Day Flow)			1 @ 6”, capacity = 1,100 gpm (flow control to limit to Max. Day)				

Imported Water Treatment Facilities

Fine screening of the imported water would be beneficial to avoid excessive maintenance on irrigation systems using non-potable water. Present operation of the imported water delivery

system is that the Cherry Valley Pump Station on EBX operates 24/7 when BCVWD takes imported water. This is normal operation except if there are down times for maintenance etc. Recently the SWP is shut down in February for the entire month for inspection and maintenance. Imported water is not available to BCVWD during this time. When SPW is not available, Well 26 can be used to supplement the non-potable system if required. February shutdown is not a problem since recycled water demands are low at that time and the City's recycled water supply is more that adequate.

The imported water screening system would consist of the construction of a vertical turbine, can-type booster pump station to provide the additional pressure to operate the fine screens and overcome the pressure drop through the screen and the piping losses to the 2800 Zone NP Tank (approximately 60 ft). The pump station would have three pumps, one is a standby. The pumps would discharge to a set of three automatic fine screens with 300 µm perforations, each rated at 1,250 gpm in a 2 duty/1 standby configuration. The screen capacity will be adequate through build-out. Refer to Table 6-12. The discharge from the fine screens will enter the 2800 Zone NP Tank at one of the inlet pipes. Flush water to clean the screens is provided by unscreen SPW. The waste flush water would be discharged to the Grand Avenue (MDP Line 16) stormwater settling pond.

Table 6-12
Imported Water Screening and Pumping Facility

	Year						
	2020	2025	2030	2035	2040	2045	Build-out
Supplemental Water Required on Max. Day, mgd (gpm)	4.32 (3,002)	2.46 (1,707)	2.48 (1,724)	2.55 (1,770)	2.64 (1,834)	2.56 (1,776)	-
Imported Water Treatment Flow, gpm	1,640	1,868	1,961	2,111	2,336	2,490	2,004
2025		Install 3 @ 1,250 gpm Automatic Screens, 300 µm perforated, 2 duty/1standby with 3 @ 1,250 gpm, vertical turbine, booster pumps 2 duty/1 standby, 60 ft TDH, 30 HP					

The design capacity of the initial screening facility is based on providing screening only to the imported water entering the non-potable water system. In the future screening may be considered for all of the imported water flow to reduce the clogging potential and maintenance of the recharge ponds. To allow for this option, the initial facility layout should have space allocated for expansion if it is ever necessary.

3000 Non-potable Pressure Zone

The 3000 Pressure Zone has minimal general landscaping requirements (22 AFY); almost all of the non-potable water demand is for the Highland Springs (South) Golf Course (116 AFY), totaling 138 AFY at build-out, (from Table 5-17d). Unlike Oak Valley Greens (2800 NP Pressure Zone) and Morongo Tukwet (2600 NP Pressure Zone) Golf Courses, Highland Springs (South) Golf Course does not have a standby supplemental well supply; it will need to be supplied all year. The Golf Course currently uses potable water from BCVWD's potable water system year around. As a result, the 3000 NP Pressure Zone system considers the peak demand from the Highland Springs (South) Golf Course. (The older Highland Springs (North) Golf Course has its own well supply and is not relying on BCVWD's potable water for irrigation.)

Table 6-13 shows the non-potable water demands in the 3000 NP Pressure Zone with and without Highland Springs Golf Course. For planning purposes, it is assumed the 3000 NP Pressure Zone facilities would not be installed until 2035. In Table 6-13, the Golf Course demand for recycled water will be replenished during the daylight hours so the lakes can be drawn down during the night to meet irrigation demands. As a result, the general landscape peak demands will not be coincindent with the Golf Course demands.

Table 6-13
Demands in the 3000 Non-potable Water Zone
(from Table 5-17d)

	2020	2025	2030	2035	2040	2045	Build-out
Other than Golf Course Demands							
Average Annual, AFY	0	0	0	22	22	22	22
Average Annual, mgd (gpm)	0	0	0	0.02 (13.6)	0.02 (13.6)	0.02 (13.6)	0.02 (13.6)
Maximum Day, mgd (gpm)				0.05 (34)	0.05 (34)	0.05 (34)	0.05 (34)
Peak, mgd (gpm)	0	0	0	0.15 (102)	0.15 (102)	0.15 (102)	0.15 (102)
Golf Course Demands							
Highland Springs Golf Course, AFY	0	0	0	116	116	116	116
Golf Course Average Day, mgd (gpm)	0	0	0	0.10 (72)	0.10 (72)	0.10 (72)	0.10 (72)
Golf Course Max Day, mgd from Table 5-7	0	0	0	0.26	0.26	0.26	0.26
Golf Course Peak Demand, gpm	0	0	0	305	305	305	305
Total							
Total Average Annual AFY	0	0	0	138	138	138	138
Total Max Day, with GC, mgd (gpm)	0	0	0	0.31 (214)	0.31 (214)	0.31 (214)	0.31 (248)
Total Peak, with GC, mgd (gpm)[1]	0	0	0	0.59 (407)	0.59 (407)	0.59 (407)	0.59 (407)

[1] Peak demand for golf course is not coincident with peak demand for normal irrigation.

Storage Facilities

There are two options for serving the 3000 NP Zone:

- A hydropneumatic system with a nominal operating HGL = 3000 ft msl
- A ground storage tank with a nominal HGL = 3000 msl, bottom = 2975± msl in the vicinity of the existing potable water 3040 Highland Springs tank.

2800 to 3000NP Zone Hydropneumatic Booster Station

A 2800 to 3000 NP Zone Hydropneumatic Booster Station would be located adjacent to the 2800 NP Zone Storage Tanks on the Noble Creek Recharge Facility site. The station would consiste of three vertical turbine “can” boosters and a10 ft diameter by 25 ft long, 15,000 gallon

total volume hydropneumatic tank. A small masonry building would house the booster pumps, electrical equipment, make-up air compressor, and controls. Table 6-14 summarizes the design requirements. The demand data in Table 6-14 was extracted from Table 6-13 presented previously. The pump capacity in Table 6-14 provides a 25% additional capacity to meet short term needs since there is no storage available in the Pressure Zone.

Table 6-14
3000 NP Zone Hydropneumatic Booster Pump Station Design Requirements

	2020	2025	2030	2035	2040	2045	Build-out
Average Annual Demand, AFY				138	138	138	138
Maximum Day Demand with HSGC, mgd (gpm)				0.31 (214)	0.31 (214)	0.31 (214)	0.31 (214)
Peak Demand with HSGC, mgd (gpm)				0.59 (407)	0.59 (407)	0.59 (407)	0.59 (407)
Pump Capacity, Total Head, and HP				3 @ 225 gpm, 200 ft, 15 HP, 2 Duty/1 Standby, 405 gpm firm capacity, constant speed			
Hydropneumatic Tank				10 ft diameter, 25 ft long, 14,700 gal, 80 psi maximum, 60 psi minimum, with 15 scfm at 100 psi make-up air compressor with 60 gal receiver			

3000 NP Zone Storage Tank and 2800 to 3000 NP Zone Booster

The 3000 Zone NP water tank would be constructed on a pad adjacent to the access road to the Highland Springs 3040 Zone Potable Water Tank. The 3000 NP Zone is not planned to be constructed until 2035. Table 6-15 shows the operational, emergency, and total storage requirements for the 3000 NP Zone from 2035 to build-out.

The 3000 NP Zone tank was sized based on the maximum day irrigation requirements for the Highland Springs Golf Course and the other irrigation requirements identified in Table 6-13 presented previously. It was assumed the other irrigation requirements followed the simplified nighttime pattern used previously. Highland Springs GC would take water during daylight hours to fill the on-site irrigation lakes. To be conservative, the lake replenishment would occur over a 9 hour period (8 am to 5 pm). Water will be boosted to the tank from the 2800 NP Zone tank(s) through a new 2800 to 3000 NP Zone Booster located at the 2800 NP Zone tank site. so the storage was based on 19 hours of pumping.

Table 6-15
Storage Required in 3000 Non-potable Water Pressure Zone

	2020	2025	2030	2035	2040	2045	Buildout
Operational Storage, MG				0.21	0.21	0.21	0.21
Emergency and Dead Storage, MG				0.05	0.05	0.05	0.05
Total Storage Required, MG				0.25	0.25	0.25	0.25
Total Storage Provided, MG				0.275	0.275	0.275	0.275
Characteristics				Diameter = 44 ft, Height = 24 ft Bottom El 2985 ±			

The 2800 to 3000 NP Zone Booster Pump Station requirements are shown in Table 6-16. This assumes the hydropneumatic system alternative described above is not selected. The pump station will be located adjacent to the 2800 Zone Tank(s) on BCVWD's groundwater recharge site. The booster pump station is not planned to be constructed until 2035 and would be adequate through build-out.

Table 6-16
2800 Zone to 3000 NP Zone Booster Pump Station Requirements
(In-lieu of hydropneumatics system)
(From Table 6-13)

	2020	2025	2030	2035	2040	2045	Buildout
Average Annual, AFY (gpm)				138 (86)	138 (86)	138 (86)	138 (86)
Maximum Day,24-hr pumping, mgd (gpm)				0.31 (214)	0.31 (214)	0.31 (214)	0.31 (214)
Maximum Day,19-hr pumping, gpm				270	270	270	270
Design Requirements				2 @ 500 gpm, 220 ft TDH, 40 HP, 1 duty/1 standby			

2600 Non-potable Pressure Zone

Storage Facilities

Table 6-11 presented previously, shows the demands in the 2600 and 2400 NP Pressure Zones. There is adequate storage in the 2800 Zone to supply the 2600 and 2400 Pressure Zones through pressure regulators; however, it would be beneficial to provide some storage in the 2600 Zone for more flexible operation as described above for the 2800 NP Zone storage. Table 6-17 identifies the storage requirements for the 2600 NP Zone, (including the 2400 NP

Zone), assuming there is a 24 hour constant supply from the 2800 NP Zone that is limited to the maximum day demand for the combined 2600 and 2400 NP Zones.

Table 6-17 shows that 1.5 MG of storage in the 2600 Pressure Zone is adequate for Build-out. This should probably be constructed by the year 2030 at the earliest. The optimum location for the 1.5 MG tank is south of CA 60 where most of the demand occurs. If property becomes available for a 2600 NP Zone Tank in the optimum location as a result of development prior to 2035, consideration should be given to securing the property.

Table 6-17
Storage Required in 2600 and 2400 Non-potable Water Pressure Zones

	2021	2025	2030	2035	2040	2045	Build-out
Operational Storage, MG	0.68	0.87	1.01	1.07	1.09	1.09	1.09
Emergency and Dead Storage, MG	0.27	0.29	0.30	.31	.31	.31	.31
Total Storage Required, MG	0.94	1.16	1.31	1.38	1.40	1.40	1.40
Construct 1.5 MG 2600 Zone Tank in 2035				1.5	1.5	1.5	1.5
Characteristics				103 ft diameter, 24 ft shell height, bottom elev 2590 msl			

Pressure Regulating Facilities

Table 6-18, shows the demands in the 2400 NP Pressure Zone taken from Table 5-19a presented previously in Section 5. The minimum demand is assumed to be half of the average annual demand. Pressure regulating facilities will be installed in the 2600 NP Zone at two locations to supply the 2400 NP Zone.

- On Palmer Ave. south of Armour Ave.
- At end of cul-de-sac., off of Brewer Dr., south of Roberts Dr. with Tract 31462-19

The regulator size and capacity is shown in Table 6-18. The initial regulator will be adequate for build-out.The regulators are sized such that either can provide the total peak demand.

2400 Non-potable Pressure Zone

The 2400 NP Pressure Zone is supplied from the 2600 NP Pressure Zone through pressure regulating stations described above in Table 6-18 with the 2600 NP Zone facilities. There are no other facilities needed for the 2400 NP Zone.

Supplemental groundwater extracted from San Timoteo Creek could be introduced into the 2400 NP Zone which will require extraction, storage and pumping facilities in the 2400 NP Zone; this is a separate project and is described in more detail later in this section.

Table 6-18
Non-potable Water Demands in 2400 Pressure Zone

	2021	2025	2030	2035	2040	2045	Build-out
Average Annual, AFY (gpm)	54 (33)	79 (49)	79 (49)	79 (49)	79 (49)	79 (49)	79 (49)
Maximum Day, mgd (gpm)	0.12 (84)	0.18 (122)	0.18 (122)	0.18 (122)	0.18 (122)	0.18 (122)	0.18 (122)
Peak Demand, mgd (gpm)	0.36 (251)	0.53 (367)	0.53 (367)	0.53 (367)	0.53 (367)	0.53 (367)	0.53 (367)
Minimum Demand, gpm	17	24	24	24	24	24	24
Pressure Regulator at Palmer Ave. and Armour Ave.	2 @ 2 in, capacity 420 gpm						
Pressure Regulator off of Brewer Dr, south of Roberts Dr. with Tract 31462-19.		2 @ 2 in, capacity 420 gpm					

Facilities for Recharge of Recycled Water

Surplus recycled water is available during late fall through spring when landscape irrigation needs are minimal. This surplus recycled water can be delivered to Morongo Tukwet or Oak Valley Greens Golf Courses as discussed earlier in this Master Plan or recharged to the Beaumont Basin at the Noble Creek Recharge Facility or another suitable location overlying the Basin. Currently the City of Beaumont provides full MBR treatment with nitrogen reduction and partial reverse osmosis treatment (currently about 50%, 33% at design capacity), with UV disinfection.

The City of Beaumont prepared a recycled water strategy report (Strategy Report) which was presented and adopted by the City Council in March 2022.[6] The City's goals outlined in the Strategy Report were:

- Maximize the production and beneficial use of City-produced recycled water,
- Offset some of the need to imported water in the adjudicated Beaumont Groundwater Basin
- Minimize the City's long-term state-imposed liability as the producer of recycled water, and
- Encourage and support sustainable development

[6] City of Beaumont (2022). *Recycled Water Reuse Strategy Analysis Report*, prepared by Hunt Thorton Resource Strategies, LWA, and Todd Groundwater, January.

BCVWD supports these goals and this Master Plan addresses BCVWD's role in assisting the City in achieving these goals as a cooperative project.

The Strategy Report proposed four options for recycled water use; the City's preference is Option 3, which BCVWD supports.

Option 3:

In this option, the City provides "Full Advanced Treatment" (FAT) which includes 100% RO treatment of the secondary effluent followed by an advanced oxidation process to breakdown any trace residual organics. Full Avanced Treatment normally consists of reverse osmosis treatment of all of the flow to be recharged followed by advanced oxidation consisting typically of high dose UV irradiation augmented with a strong oxidant like hydrogen peroxide. The advanced oxidation is necessary to break down any organics such as N-nitrsodimethylamine (NDMA) and other chemicals of emerging concern (CECs). The UV dose is much greater than currently used for effluent disinfection and the equipment is different, typically enclosed versus open channel for effluent disinfection. Disinfection would comply with Title 22 FAT requirements for IPR.

BCVWD would construct a recycled water pump station at the WWTP and use BCVWD's existing non-potable water distribution system to convey the FAT-product water to the NCRF. Delivery of irrigation water to users would be at BCVWD's option using very high quality FAT product water.

Because there is insufficient FAT-product water to meet peak irrigation demands, BCVWD's non-potable water distribution system would continue to be supplemented during the high irrigation demand period with non-potable groundwater, potable groundwater, and possibly screened State Project Water. BCVWD's non-potable water distribution system would be pressurized by the existing 2 million gallon (MG), 2800 Zone Non-Potable Zone Tank.

BCVWD's Hybrid Option (Option 3A)

BCVWD belies a hybrid Option 3A may be offer advantages to the City and BCVWD and acceptable to the regulators. Option 4A has benefits to the City and the District's rate payers. Option 3A would have the City's WWTP producing MBR effluent with 50% RO and Title 22 disinfection on an interim basis until such time as the amount of water on an annual basis approaches the maximum allowable "Recycled Water Contribution" (RWC) as stated in the regulations.[7] This will probably not occur until 2030 or 2035. At that time, FAT treatment would be initiated by adding full, 100% RO and advanced oxidation per the regulations. Recycled water would be pumped into the 2800 NP Zone and during the winter months when recycled

[7] The RWC is based on the fraction equal to the quantity of recycled municipal wastewater applied at the recharge facility divided by the sum of the quantity of recycled municipal wastewater and credited diluent water. The RWC is based on 120-month (10-year) running monthly average.

water demands are greatly reduced, the 2800 NP Zone Tank would overflow to the NCRF spreading grounds. Facilities already exist to recharge any reservoir overflow, should that occur.

An advantage would be that once the appropriate permits are obtained, recycled water could immediately be recharged rather than discharged into Cooper's Creek during the winter months as it currently is when irrigation demand is minimal. There would not be a need to wait until additional construction is completed so treated recycled water beneficial use can be maximized. There would also be time to arrange financing and allow any rate increases to be gradual.

The amount of recycled water available has been presented previously in Table 5-20 based on a month-by-month analysis of recycled water use. The amount available for recharge is presented again in Table 6-19 for convenience.

Table 6-19
Amount of Recycled Water Available for Recharge

	2021	2025	2030	2035	2040	2045	Build-out
Recycled Water Available from the City of Beaumont AFY (see note)	-	377	493	685	740	831	3,248
Recycled Water Available in any Month, AF (mgd)	-	164 (1.78)	192 (2.08)	236 (2.56)	250 (2.72)	267 (2.90)	508 (5.51)
Recycled Water Contribution (RWC) percent based on average annual recharge (6,960 AFY)	-	5.4	7.1	9.9	10.6	11.9	46.7

Note: Habitat maintenance flow, on-site uses, and reject brine has been deducted from total wastewater flow.

From 2006 through 2021, BCVWD has recharged 111,360 AF of SPW at the Noble Creek Recharge Facility. The average year is 6,960 AFY; the minimum amount recharged in any one year during that period was 2,399 AF (round to 2,400 AFY) in 2008.

The MDP Line16 stormwater capture project, projected to generate about 500 AFY on the average, will be completed in 2023, bringing the total recharge to an average of 7,460 AFY or 2,899 AF minimum in any year based on historical records. BCVWD believes the MDP Line 16 captured water will meet the "diluent water requirements under the IPR regulations, but may have to be tested. The amount of SPW that will be recharged will increase over time to meet increased demands.

The recycled water from the City of Beaumont which would be recharged is only a small percentage of the total projected annual recharge until after 2045, ranging from 5.4 % in 2025 to 11.9% in 2045. Based on the City's General Plan population (see Section 3 for discussion), this would hypothetically increase to 46.7% of the current annual average recharge at build-out. The RWC percentages in Table 6-19 are based on existing average SPW recharge quantities. This will change over time. The initial maximum amount Recycled Water Contribution (RWC) allowed per the current Title 22 regulations at start-up is 20%. Initially to say 2035 or 2040, it might be possible to avoid Full Advanced Treatment since the RWC is just over 10%, one-half of the regulatory maximum. However, after 2045 closer to buildout, FAT will be required in order to utilize the additional recycled water available as indicated in Table 6-19. The City of Beaumont and BCVWD should discuss this with the DDW and the Regional Board and see if partial or full reverse osmosis would be permitted initially. At the appropriate time FAT, as defined in Title 22, can be implemented.

It should be pointed out that if IPR is implemented, supplying water on a routine basis to Oak Valley and Morongo Tukwet Golf Courses during the winter months as described previously would likely not be occurring.

Supplemental Groundwater

Non-potable groundwater could be used to supplement the recycled water supply to the non-potable water system in the summer months when the demand is high. BCVWD currently uses non-potable groundwater from Beaumont Basin Well No. 26 for all of the non-potable water supply in the 2800 NP Zone. The groundwater pumped by Well 26 is subject to the Beaumont Basin Judgement and is taken from BCVWD's storage account. To maintain the storage account balance, it must be "replaced" with SPW. Pumping levels are deep, over 500 ft below ground surface, which makes pumping expensive and energy intensive.

When recycled water is available, the amount of supplemental water from Well 26 will be substantially reduced. This was addressed in Section 5, Table 5-20. The amount needed is between 228 and 328 AFY between now and 2045. However, it would be beneficial to consider other non-potable groundwater sources.

- High nitrate groundwater at the mouth of Edgar Canyon
- Groundwater extraction wells in San Timoteo Canyon downstream of the City of Beaumont's WWTP discharge

Mouth of Edgar Canyon

There are several potential projects to collect high nitrate groundwater to supplement the non-potable water system. The high nitrate groundwater is otherwise not useable without costly treatment to remove nitrate. Blending it into the non-potable water system would provide beneficial nitrogen (fertilizer) to the plant and landscape materials and facilitate remediation of

groundwater underlying the mouth of Edgar Canyon by extracting out the contaminated water allowing recharge by low nitrogen precipitation and streamflow. BCVWD believes there could be 300 to 500 AFY or more of water available from this source. But hydrologic studies would need to be done to confirm the yield as well as the technical and economic feasibility.

There are two general locations:

- Bonita Vista Area
- Mouth of Edgar Canyon vicinity of Edgar Canyon Spreading Grounds

Both of these projects are not in the Beaumont Basin and are not under the adjudication. These projects have been identified in previous BCVWD Capital Improvement Programs and should be evaluated as a source of non-potable groundwater to supplement the non-potable water system during high demand periods.

Bonita Vista Groundwater Collection System

The Bonita Vista Water Company has been served by BCVWD for over twelve years. The Water Company's wells experienced high nitrates and the area needed another water supply. This area is entirely on septic tanks. The residents requested and were granted annexation into BCVWD. The Bonita Vista Water Company had several old wells which have not been in service for a number of years and may be capped and abandoned. The wells had a reported capacity of about 100 gpm. Two properties in Bonita Vista are owned by BCVWD:

- On Mountain View Ave. just north of Erlinda Ct., 0.19 acres, (APN 401-100-002)
- On Mountain View Dr. just east of Rancho Dr., 0.13 acres, (APN 401-050-002)

These parcels are believed to be past well sites. According to DWR's Well Completion Report Website, wells in this area are about 300 ft deep. There were no records of Bonita Vista Wells on DWR's website. A hydrogeologic study and perhaps some pilot wells should be drilled on the District-owned parcels to determine if these sites are suitable for extraction wells. If feasible, wells could be drilled and could be connected to a series of pipelines leading to the 2800 NP Zone tank at the Noble Creek Recharge Facility. See Figure 6-2.

A 6-in pipeline would extend south in Rancho Road and Eucalyptus Lane to Mountain View Ave. Another 6-in line would extend south in Mountain View Ave. to Eucalyptus Lane. From this point, the line would be 8-in diameter and follow Eucalyptus Lane to Tokay St, then follow Tokay to the Spreading Grounds in Edgar Canyon. The pipeline would cross the spreading grounds to Avenida Miravilla, then south in Avenida Miravilla and Live Oak Ave. to the 2800 Zone Non-potable Tank. Pipe sizing and location are conceptual; final routing and diameters will depend on the number of other wells incorporated into the groundwater extraction program and existing utilities. See Figure 6-2.

Table 6-20 shows the facilities needed for Bonita Vista Extraction Wells

Table 6-20
Bonita Vista Extraction Wells

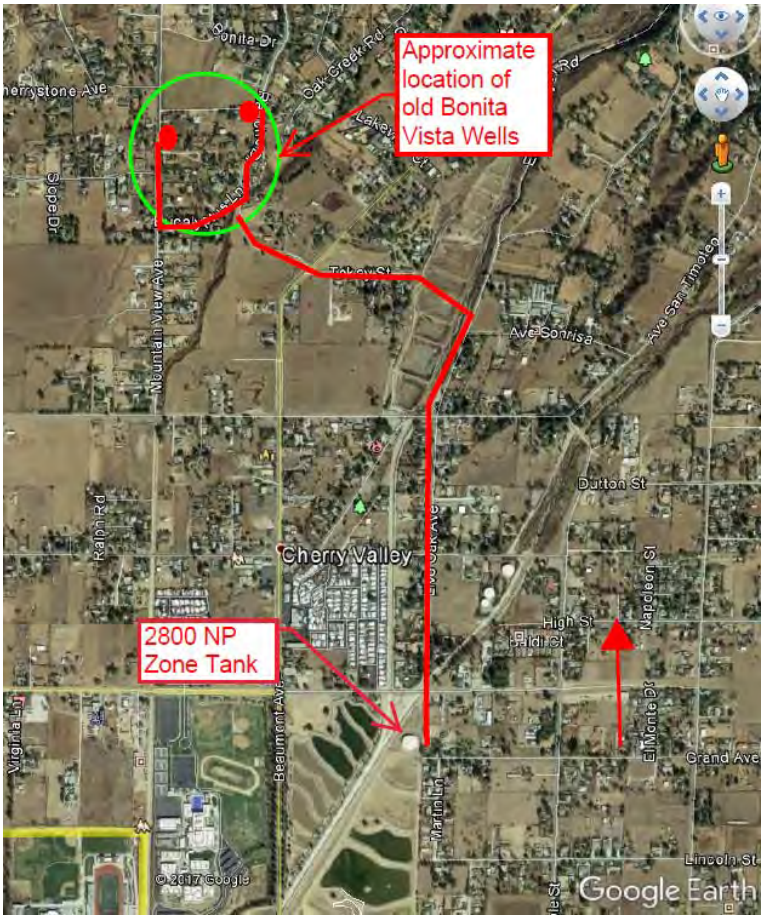
Facility	Size/Capacity etc.
Extraction Well Mountain View Ave. near Erlinda Ct.	
Estimated Capacity	100 gpm
Casing Diameter	8 in
Estimated Depth	300 ft
Well Pump	100 gpm @ 150 ft TDH, 7.5 HP
Extraction Well Mountain View Ave. near Erlinda Ct.	
Estimated Capacity	100 gpm
Casing Diameter	8-in
Estimated Depth	300 ft
Well Pump	100 gpm @ 150 ft TDH, 7.5 HP

Shallow Extraction Wells at Mouth of Edgar Canyon

The lower end of Edgar Canyon in the vicinity of the Edgar Canyon Spreading Grounds, operated by BCVWD but leased to SGPWA, is an area of high nitrate groundwater. The USGS, in a report prepared in cooperation with SGPWA[8], stated that nitrate concentrations in wells in the USGS study ranged from 1.0 to 11.3 mg/L as nitrogen (MCL = 10 mg/L). The highest concentration (11.3 mg/L) was in well 2S/1W-22G4, located in Edgar Canyon just upstream of the existing canyon spreading grounds. See Figure 6-3. It is believed that groundwater is "leaking" through the Banning Fault Barrier into the Beaumont Basin bringing nitrates into the Beaumont Basin.

[8] USGS (2006). Geology, Ground-water Hydrology, Geochemistry and Ground-water Simulation of the Beaumont and Banning Storage Units, San Gorgonio Pass Area, Riverside County, California,Rewis, D. L. et al, in cooperation with the San Gorgonio Pass Water Agency, Special Investigations Report 2006-5026.

Figure 6-2
Bonita Vista Groundwater Collection System



It is believed that a series of extraction wells could capture this groundwater for use in BCVWD's non-potable water system. It is estimated the yield could be as much 250 gpm, (5 wells at 50 gpm each), or about 150 to 200 AFY. Extensive hydrogeologic investigations and pilot wells would be necessary before implementing this project however. By extracting this shallow groundwater and putting it to beneficial use would reduce the amount of high-nitrate groundwater "leaking" into the Beaumont Groundwater Basin and allow natural recharge to occu improving water quality over time. (Note that this project was formerly known as the "Pollution Control Project".)

Additional extraction wells could be extended to the east of the Canyon Spreading Grounds, again depending on hydrogeologic studies and pilot wells. Figure 6-4 shows the location of additional shallow extraction wells. The depth of groundwater and groundwater quality in this easterly area is not known, but BCVWD should consider some initial investigation.

Figure 6-3
High Nitrate Shallow Extraction Wells West of the Edgar Canyon Spreading Grounds

It is believed that the easterly phase of the project shown in Figure 6-4 could yield about 150 to 200 gpm (4 wells at 50 gpm) or about 175 to 200 AFY. Again this area is not within the adjudicated Beaumont Basin so extractions would not be deducted from BCVWD's storage account.

Table 6-21 shows the Edgar Canyon Non-potable Extraction Well Facilities.

Figure 6-4
High Nitrate Shallow Extraction Wells Vicinity of the Edgar Canyon Spreading Grounds (Easterly Phase)

Table 6-21
Edgar Canyon Extraction Wells

Facility	Size/Capacity etc.
Extraction Wells West of Edgar Canyon Spreading Grounds	
No. of Extraction Wells	4
Estimated Capacity, each	50 gpm
Casing Diameter	8 in
Estimated Depth	300 ft
Well Pump, each	50 gpm @ 150 ft TDH, 3 HP
Extraction Wells East of Edgar Canyon Spreading Grounds	
No. of Extraction Wells	4
Estimated Capacity, each	50 gpm
Casing Diameter	8-in
Estimated Depth	300 ft
Well Pump, each	50 gpm @ 150 ft TDH, 3 HP

San Timoteo Canyon Extraction Wells

There is an area along San Timoteo Canyon Rd., (Oak Valley Parkway) between the Morongo Tukwet Golf Course to the west end of the Fairway Canyon Development (west of Palmer Dr.) that has high groundwater, less than 50 ft below ground surface or so for most of the area. The area at the northerly end of Crenshaw Dr. in Fairway Canyon experiences surface seeps of groundwater during the winter and spring. Street pavement in this area is impacted.

The City of Beaumont drilled two wells about year 2010 along Oak Valley Parkway. One (Well #1) is located on City property adjacent to the City's Wastewater Lift Station at the end of Crenshaw St; Well #2 is located at the southeast end of Nicklaus Paw Park. The wells have not been equipped. BCVWD has no data on the wells which were designed by Wildermuth Environmental. It is believed that each of the wells could produce as much as 200 gpm and supplement the non-potable water system. These wells are outside of the Adjudicated Beaumont Basin so the production would not have to be replaced.

BCVWD believes each of the two extraction wells could produce about 0.45 acre-ft/day or an annual average of 100 AFY assuming some "rest". The build-out, average annual non-potable water demand in the 2400 NP Zone is 66 AFY. The two wells should be able to meet the maximum day demand supplemented by the 2600-2400 NP Pressure Regulating Stations for peak hour demand.

The project could be constructed in several phases:

- Phase 1 would consist of a 12-in 2400 NP Zone pipeline extending from an existing 18-in, 2400 NP Zone pipeline in the intersection of Oak Valley Parkway and Palmer Dr., southerly in Oak Valley Parkway to an easement across Morongo-Tukwet Golf Course, then through the easement to Fairway Canyon Phase 4 development, to a new 75,000 gallon 2400 NP Zone Tank constructed on a previously-graded site, (ground surface elevation = 2370±), in the Fairway Canyon Phase 4 development. The 12-in 2400 NP Zone pipeline should be installed with the other utility pipelines in Fairway Canyon Phase 4 as it develops. A 2600 – 2400 NP Zone Pressure Regulating Station would be constructed at the tank site as a secondary supply to the 2400 NP Zone including the lower elevations of Fairway Canyon Phase 4.
- The next phase (Phase 2), would equip Well #2 in Nicklaus Paw Park and connect it to the 12-in 2400 NP Zone pipeline constructed in the initial phase(s).Phase 2 also includes the construction of the 75,000 gallon 2400 NP Zone Tank. Well #2 would be controlled by the water level in the 75,000 gallon 2400 NP Zone Tank. The pressure regulators serving the 2400 NP Zone should be set to open on low tank level as back-up. Well #2 would then be the primary source of non-potable water for the 2400 NP Zone and would be supplemented by non-potable water from the 2600 NP Zone through pressure regulators.
- The Phase 3 consists of equipping extraction Well #1 adjacent to the City's Crenshaw Lift Station and construction of an 8-in 2400 NP Zone pipeline along Oak Valley Parkway from the extraction Well #1 to the existing 2400 NP Zone pipelines at the intersection of Palmer Dr. and Oak Valley Parkway. This would increase the amount of non-potable water to the 2400 NP Zone.
- Once the extraction wells are in operation and depending on their production and the possibility that additional extraction wells could be installed, surplus extracted water could be boosted into the 2600 NP Zone with a new 2400-2600 NP Zone Booster Pump. This 2400-2600 NP Zone Booster Pump Station would be constructed at the 2400 NP Zone Tank site and connected to 2600 NP Zone pipeline(s) in the Fairway Canyon Phase 4 development. To simplify operation and control, this booster pump station should not be constructed until there is a 2600 NP Zone Tank constructed.

Figures 6-5 and 6-6 show the facilities; Table 6-21 summarizes the design characteristics. A low profile storage tank is proposed to minimize the visual impact. The proposed tank is on a previously graded site (elevation 2370). Although it could be raised through a fill, BCVWD believes the nominal operating elevation of the zone can be lowered slightly to 2386 MSL without any significant impact on system operating pressure and save the cost of the structural fill. The tank is necessary to provide storage to facilitate the operation of the extraction wells. Phase 4, the construction of a 2400 -2600 NP Booster Pump Station depends on the amount of well production achievable from Wells 1 and 2, and the feasibility (technical and economical) of

adding more extraction wells in San Timoteo Canyon. No standby pump is anticipated as this is not a critical supply.

Figure 6-5
San Timoteo Canyon Extraction Well Project -- Initial Phase(s)[9]

Figure 6-6
San Timoteo Canyon Extraction Well Project -- Final Phase

[9] Routing of Pipelines through Fairway Canyon Phase 4 is only approximate and depends on final configuration of the Tract streets, grading, and pipelines.

Table 6-22
San Timoteo Canyon Extraction Wells and 2400 NP Zone Tank

Facility	Size/Capacity etc.
Phase 1 – 2400 NP Zone Pipeline	
Water Depth	16 ft (low profile)
Ground Surface Elevation	2370 MSL
Overflow Elevation	2386 MSL
Pipeline Diameter	12-in from 2400 NP Zone Tank to Palmer Dr. and Oak Valley Parkway
Pressure Regulating Station	2600 – 2400 NP Zone See Table 6-18
Phase 2 – 2400 NP Zone Tank and Equip Well #2 in Nicklaus Paw Park	
Capacity	75,000 gallons
Type	Bolted or Welded Steel
Diameter	28 ft
Well Pump	200 gpm @ 375 ft TDH, 30 HP Assumes 100 ft pumping water level below ground surface, ground surface elevation 2147 MSL
Pipeline Connection Diameter	6-in
Phase 3 – Equip Well #1 at City of Beaumont Crenshaw Lift Station and Pipeling	
Well Pump	200 gpm @ 425 ft TDH, 40 HP Assumes 100 ft pumping water level below ground surface, ground surface elevation 2095 MSL
Pipeline Diameter	8-in from Well #1 to Palmer Dr. and Oak Valley Parkway
Phase 4 – Booster Pump Station 2400 – 2600 NP Zone at 2400 NP Zone Tank Site (optional)	
Total Extraction Well Capacity	500 gpm
Number of Pumps	1 (no stand-by)
Design Capacity	500 gpm @ 220 ft TDH, 40 HP; can-type booster pump

Pipelines

The non-potable water pipelines are all relatively new having been installed after year 2000. They are ductile iron pipe, cement mortar lined with purple polyethylene identifying bagging. They are adequately sized and are in excellent condition.

The new master planned non-potable water pipelines consist of new transmission mains to accommodate growth in demand, i.e., those 16-in in diameter and larger. Also included are some smaller diameter distribution mains to serve existing and planned facilities which are to be connected to the non-potable water system most of which were not a part of the original developments.

The transmission mains to accommodate growth are to be funded from facilities fees (sometimes called “impact fees”) paid by developers. The smaller diameter distribution mains would be installed and funded by developers if needed to serve their developments. Some of the distribution mains would serve existing landscaped areas which are to be converted from potable water to non-potable water.

Project Numbering System

To facilitate the planning and budgeting for the facilities identified in this section and subsequent sections, a project identification and numbering system has been developed. For the potable water system, the following system is used:

XX – YYYY- ZZZZ

Wherein:

XX = Facility Type,
YYYY = Pressure Zone Location,
ZZZZ = Sequential Number beginning with 0001

Facility Types:

NP = Non-potable Pipeline
NT = Non-potable Tank
NBP = Non-potable Booster Pump Station
NR = Non-potable Pressure Regulating Station
NW = Non-potable Well
NM = Non-potable Miscellaneous, e.g., Treatment, Screening etc.

See Appendix A for the Non-Potable Master Plan Map, indicating the project number and location of each project.

Section 7 contains a summary of the Facility Costs, along with tables including Project Numbers, descriptions, and costs to meet the ultimate build-out demands within BCVWD.

Section 7

Facility Costs

Facility Cost Criteria

The following paragraphs describe the basis for the master planned non-potable water facility costs. All costs used in the development of master plan facility costs are current to the average Engineering News Record 20-city Average Construction Cost Index (CCI) for 2021 of 12133. Note the costs presented in Tables 7-1 through 7-8 do not include contingencies, engineering, administration, and inspection.

The Covid-19 pandemic 2020 through 2022 brought about significant impacts to the supply chain resulting in difficulty obtaining materials for capital improvement projects and unpredictable cost increases. Federal policies focused on the reduction of fossil fuel usage have impacted the cost of freight and shipping costs for materials and supplies. Substantial inflation of costs, exceeding 8% per year will have an impact on future costs. These factors should be considered when escalating the costs presented herein.

Land

Land costs are estimated at $200,000 per acre for readily developable land. This will vary depending on location, but at this time is a reasonable estimate of land. Table 7-1 shows the land cost, based on $200,000 per acre and minimum land requirements for master planned facilities.

Table 7-1
Land Area Requirements and Cost for Master Plan Facilities

Facility	Minimum Land Requirement, acre	Land Cost @ $200,000 per acre
Well Site	0.75	$150,000
Booster Pump Station	0.5	$1000,000
1 MG Reservoir	0.5	$100,000
2 MG Reservoir	0.75	$150,000
3 MG Reservoir	1	$200,000
4 MG Reservoir	1.5	$200,000

For reservoir sites requiring extensive grading or long access roads, the area is adjusted.

Wells – Drilling and Outfitting

Well costs for drilling and outfitting are presented in Table 7-2. The costs include all costs except for land costs. The costs include drilling, developing, test pumping, water quality sampling and outfitting with line-shaft type vertical turbine pumps or submersible turbine pumps depending on location and capacity. Line-shaft pumping units will be installed in a masonry building, architecturally designed with split face or fluted/scored block to be consistent with the surrounding neighborhood. The building will include electrical switch gear and telemetry. A standby generator will be provided. The site will be enclosed by a decorative, block wall fence; security cameras and intrusion alarms are included.

Table 7-2
Well Drilling and Outfitting Costs

Drilling		
Location	Description	Unit Cost
Mouth of Edgar Canyon	8-in diameter casing, > 300 ft depth, drilling, development, and test pumping	$620,000
Outfitting		
Mouth of Edgar Canyon and San Timoteo Canyon	<200 gpm, 150 ft TDH, 15 HP	$250,000
San Timoteo Canyon	>200 gpm, 200-445 ft TDH, 20 to 40 HP	$310,000

No contingencies or engineering, administration etc.

Table 7-3 shows the unit costs for steel and pre-stressed concrete reservoirs. All above ground tanks in the master plan are assumed to be steel tanks, anchored to a ring foundation, with flexible piping connections to withstand seismic action, conforming to AWWA standards.

Table 7-3
Water Storage Tank Costs

Tank Material	Condition	Unit Cost, $/gal. capacity
Steel	Above ground, graded site, minimal piping and site work	$1.20
Steel	Above ground, average site work and piping, easy access	$1.50
Pre-stressed Concrete	Buried, average site work and piping, easy access	$2.40

Tanks will be equipped with chain link security fencing, telemetry, intrusion alarms and security cameras.

Booster Pumping

Booster pump stations are assumed to be constructed of concrete block (split face, or fluted/scored units) color to match surroundings, flat or sloping roof to match surroundings, fixed or variable speed as indicated, vertical pumps, minimum 2 pumps (1 duty, 1 standby) surge control, and by-pass pressure reducing valves. The site will be enclosed by a decorative, block wall fence or wrought iron (block wall used for cost purposes); security cameras and intrusion alarms are included.

Two sources were used to estimate the cost for booster pump construction:

- "Memorandum, Updated Project Cost Estimates for CIP" prepared for a client in Washington state, October, 1999, ENRCCI = 6928, updated to fourth quarter, 2014, ENRCCI = 9845. 3-pumps (2 duty/1 standby), no generator, 175 ft TDH.
- "Appendix G, Cost Estimating Assumptions," West Yost and Associates, for City of Tracy (CA) Citywide Water System Master Plan, July, 2012, ENRCCI approximately 9300. Costs are based on firm pumping capacity and stated to include hypochlorite chemical feed and standby power.

The costs from these sources was adjusted to the 2021 average CCI and curve fit with the following equation: need to update the curve equation

Cost, $, = $-9493.2 *(FPC)^2 + 348011 * (FPC)+929132$

FPC = Firm Pumping Capacity, mgd

The costs from this curve fit equation are presented in Table 7-4.

Table 7-4
Booster Pump Station Cost

Firm Pumping Capacity @ 175 ft TDH, mgd	Cost
0.25	$1,016,000
0.5	$1,101,000
1	$1,268,000
2	$1,588,000
3	$1,888,000
5	$2,432,000
7.5	$3,006,000

Pressure Regulating Stations

Pressure regulation stations are installed above ground, with a decorative wrought iron fence, typically located in street medians, street parkways, parks, or other public areas, so land

purchase is usually not required. Where street parking is not available a off-street parking is provided for maintenance vehicles. In the typical installation, the stations have a pair of small diameter regulators to meet the typical day to day water requirements supplemented by a larger regulator used to provide increased flow for peak demand periods. The regulators are set to open at different pressures. The multiple regulator system minimizes maintenance and improves pressure control. Pressure regulating stations are proposed to be equipped with flow meters to indicate and totalize flow. This is useful to monitor flow from one pressure zone to another. Ultimately the flow meter will be connected to the District's SCADA system. Table 7-5 shows the estimated cost for pressure regulating stations for planning purposes. Although the size of the regulators vary from location to location, the overall cost differences associated with regulator size are not significant to affect the planning level cost estimates in this Master Plan. Furthermore, since they are planned to be installed in public rights-of-way, land costs are not included.

Table 7-5
Pressure Regulating Station Cost

Condition	Cost
New pressure regulating station	$125,000
Upgrade or expansion of existing regulating station	$62,000

Transmission Piping

The costs for transmission piping are based on the District's standard cement mortar lined, ductile iron pipe with purple polyethylene encasement installed in conformance with District standards. The pipes shall be suitable for 150 psi minimum. Several approaches were used to estimate the cost of the piping:

1. Units costs from developer estimates currently under plan review
2. Unit costs for materials from a recent quote from a pipeline supplier supplemented with trenching and pipe installation costs developed from R. S. Means Cost Guides. The pipeline costs were increased by twenty percent to account for fittings, air and vacuum release valves, blow-offs and isolation valves. Water service connections and backflow prevention equipment were not included as they are part of the developers' tract installation requirement.
3. Review of master plan reports prepared by engineering consultants for other water and recycled water agencies.

Two types of estimates were prepared: one for in-tract developments, where streets are not paved and traffic control is not required and one in existing urban streets with pavement removal and replacement, traffic control etc. Table 7-6 shows the unit costs for the transmission mains for the two construction conditions.

Table 7-6
Transmission Main Unit Costs

Diameter, in	In-tract, no pavement removal or replacement, $/ft	In existing urban streets with pavement removal and replacement, traffic control, $/ft
16	$152	$244
18	$176	$283
20	$198	$309
24	$245	$369
30	$356	$496
36	$552	$718

Distribution Piping

The Master Plan includes non-potable water distribution piping, sizes less than 16-in diameter. The District has standardized on 8-in and 12-in diameter distribution mains, but in some areas where demands are low and there is little likelihood of additional demand, 6-in diameter may be appropriate. Table 7-7 shows the costs for 6-in, 8-in and 12-in distribution mains in existing urban streets with pavement removal and replacement and traffic control. All in-tract distribution mains are the responsibility of the individual developers.

Table 7-7
Distribution Main Unit Costs

Diameter, in	In existing urban streets with pavement removal and replacement, traffic control, $/ft
6	$111
8	$142
12	$165

Non-potable Water Treatment

Recycled water provided by the City of Beaumont meets Title 22 requirements for unrestricted use for irrigation of parks, playgrounds, and schoolyards, and other approved uses. Partial reverse osmosis is provided by the City to reduce Total Dissolved Solids (TDS) to comply with the effluent TDS requirements for maximum benefit. The City may, at their option, provide Full Advanced Treatment which includes full reverse osmosis treatment followed by high dose UV (286 mJ/cm^2) and advanced oxidation using hydrogen peroxide, ozone, chlorine, or other oxidant.

Groundwater recharge of surplus recycled water is discussed in this Non-potable Water Master Plan for indirect potable reuse. This would require extensive hydrologic studies to determine the travel (residence) time in the groundwater basin prior to extraction by existing wells and revision to the City's master recycled water permit. Recharge would likely occur at BCVWD's groundwater recharge site since piping facilities already exist to the 2800 NP Zone Tank located at the recharge site. Piping would extend from the 2800 NP Zone Tank to the main feeder pipelines to the Phase 1 and/or Phase 2 recharge facility sites.

Another option is the SGPWA's Fiesta Recharge Facility along Noble Creek with SGPWA approval. A metered turn-out can be provided from BCVWD's non-potable water distribution system.

No costs have been included in this Master Plan for "Treatment" since the costs will likely be on a "per million gallons" or "per acre-ft" basis as agreed to between the City and BCVWD. A draft agreement has been developed which is under review by both agencies.

Treatment for Direct Use of Imported Water

A fine screening facility is proposed for imported water introduced into the non-potable water system. The screens are recommended to remove fine debris and algae to minimize maintenance in the non-potable water system. The screens will be automatic, motorized, self-cleaning strainers, 300 µm opening; costs were developed from vendor quotes.

Contingencies, Engineering, Inspection and Other Costs

Considering this is a planning level cost estimate, a contingency of 30% of the estimated project construction cost is recommended. Note that land costs are not included in the construction cost. Contingencies cover the unknowns which could include site geology, rock excavation or blasting, unknown substructures and utilities, pavement removal and replacement requirements over and above what is normally expected for pipeline trench installation, need for boring and jacking, and other unforeseen conditions. The contingency allowance will be based on the total construction cost for the project.

Each project will have design engineering and permitting (CEQA etc.); legal services for contract review, land acquisition, etc.; inspection and materials testing; construction contract administration (shop drawings and submittals, RFIs, etc.); and project close-out costs. Table 7-8 summarizes these costs.

Table 7-8
Engineering and Other Allowances for Major Facilities and Pipelines

Item	Major Facilities Percentage	Pipelines and Transmission Mains Percentage
Design Engineering	7.5%	3.5%
Survey and Geotechnical including project staking and materials testing	5%	3%
Permitting and Environmental Documentation	3%	1.5%
Construction Contract Administration, Shop Drawing Review, RFIs and Inspection	7.5%	4%
Legal and General Administrative	2%	1%
Total Engineering and Other Costs Applied to the Total of Construction Cost plus Contingency	25%	13%

For pipeline work, engineering and other allowances will be less since the design engineering and geotechnical work is less complex, environmental permitting costs are reduced along with construction contract administration, shop drawing review, and legal and administrative. These are also reflected in Table 7-8.

These costs, sometimes called “soft costs,” are included as a percent of the total construction cost with contingencies included. Land costs are then added to develop the total project cost. For facilities that are expansions of existing facilities, some of the costs are reduced, e.g., permitting, geotechnical and surveying, etc.

Master Plan Facility Costs

The Non-potable Master Plan Facilities are identified in Section 6. Master Plan pipelines are shown on the system map included in Section 1 – Figure 1-4.

The pipeline facilities include transmission mains (16-in diameter and larger) and some distribution mains (less than 16-in in diameter) needed to complete loops or serve areas with demands that can be supplied with reduced diameter pipelines.

The following **tables (foldouts)** at **the end of this Section** list the master plan non-potable water pipeline facilities, including estimated cost, estimated year of construction, and funding sources:

- Table 7-9 – Non-potable Water Master Plan Pipelines, 2400 Zone
- Table 7-10-- Non-potable Water Master Plan Pipelines, 2600 Zone
- Table 7-11-- Non-potable Water Master Plan Pipelines, 2800 Zone
- Table 7-12-- Non-potable Water Master Plan Pipelines, 3000 Zone

Table 7-13
Summary of Master Planned Non-potable Water Transmission Piping Costs by Year (>16 in)

Year	Total Pipeline Cost	Funding Source		
		Facilities Fees	BCVWD	Developer
2023	$ 2,452,900	$ 2,452,900	$ -	$ -
2025	$ 4,245,300	$ 2,482,400	$ -	$ 1,762,900
2030	$ 5,468,100	$ 5,229,300	$ -	$ 238,800
2035	$ -	$ -	$ -	$ -
2040	$ 3,757,100	$ 939,275	$ -	$ 2,817,825
2045	$ -	$ -	$ -	$ -
Build-out	$ -	$ -	$ -	$ -
Total	$ 15,923,400	$ 11,103,875	$ -	$ 4,819,525

Table 7-14
Summary of Master Planned Non-potable Water Distribution Piping Costs by Year (<16-in diameter)

Year	Total Pipeline Cost	Funding Source		
		Facilities Fees	BCVWD	Developer
2023	$ 308,800	$ -	$ -	$ 308,800
2025	$ 4,275,900	$ 3,840,800	$ -	$ 435,100
2030	$ 11,929,200	$ 6,081,000	$ -	$ 5,848,200
2035	$ 421,100	$ -	$ -	$ 421,100
2040	$ 2,592,000	$ -	$ -	$ 2,592,000
2045	$ -	$ -	$ -	$ -
Build-out	$ -	$ -	$ -	$ -
Total	$ 19,527,000	$ 9,921,800	$ -	$ 9,605,200

Facilities Other than Pipelines

The list of major facilities, e.g., tanks, booster pumps, pressure regulators etc., by pressure zone, are shown in Table 7-15 along with the funding source(s). **Table 7-15 is a Foldout at the end of this section**.

Table 7-16 shows a breakdown of the master plan major non-potable water facilities by type; Figure 7-1 shows the cost breakdown graphically. The total cost of the non-potable water master plan facilities, including pipelines, to build-out is over $36 million.

Table 7-16
Total Cost, Funding Sources and Facilities Fees for
Non-potable Water Facilities by Type to Build-out

		Funding Source		
Major Facility Type	Total Cost	Facilities Fees	BCVWD (Depreciation)	Developer
Tanks	$ 9,011,250	$ 9,011,250	-	-
Booster Pumps	$ 5,485,975	$ 5,485,975	-	-
Regulators	$ 3,369,713	$ 3,369,713	-	-
Transmission Pipelines	$ 15,923,400	$ 11,103,875	-	$ 4,819,525
Distribution Pipelines	$ 20,245,100	$ 10,639,900	-	$ 9,605,200
SPW Screening Treatment	$ 3,292,692	$ 3,292,692	-	-
Total	$ 57,328,130	$ 42,903,405	-	$ 14,424,725

As can be seen in Table 7-16, nearly 75% of the Non-potable Water Facility costs will be paid from Facilities Fees (Impact Fees).

Table 7-17 shows the Non-potable Water Master Plan project expenditures over time through build-out.

Figure 7-1

Non-potable Water Master Plan Costs to Build-out

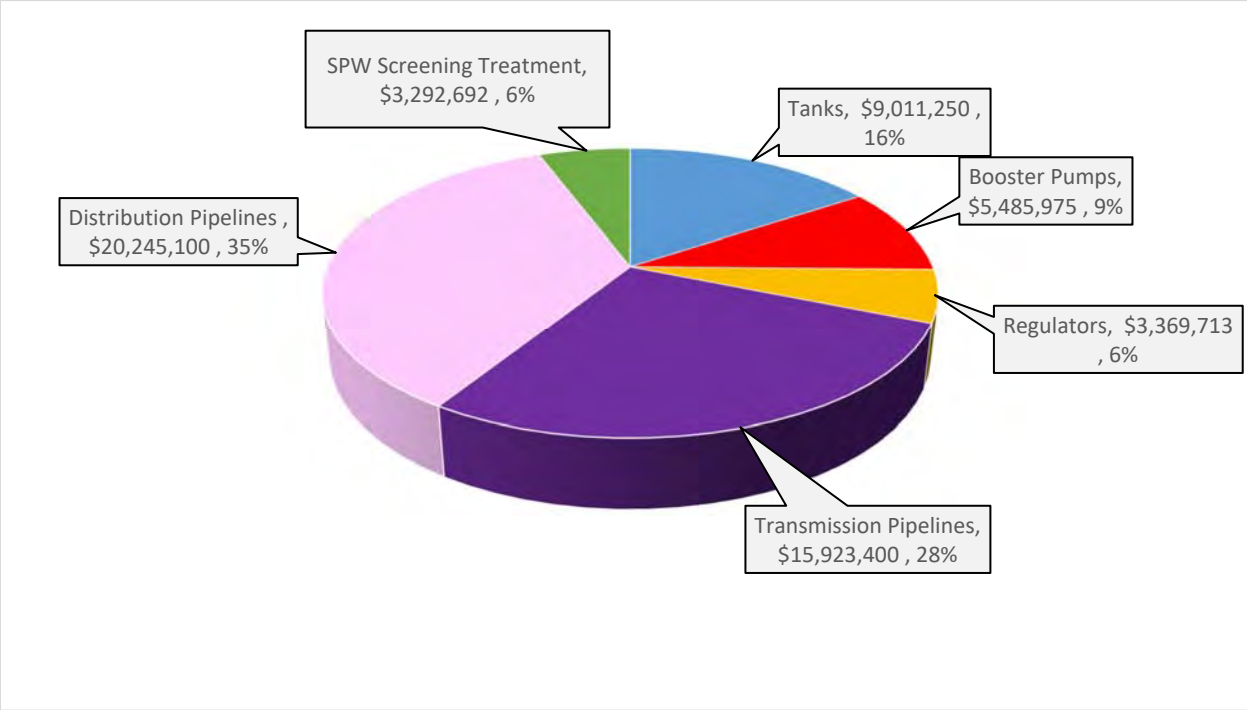


Table 7-17
Non-potable Water Master Plan Facility Expenditures Over Time ($000s)

Year	Tanks	Booster Pumps	Regulators	Transmission Pipelines	Distribution Pipelines	SPW Screening Treatment	**Total**
2023	0	0	0	2,453	309	0	**2,762**
2025	3,900	3,102	1,991	4,245	4,276	0	**17,514**
2030	270	1,811	366	5,468	11,929	2,903	**22746**
2035	1,073	573	813	0	1,139	390	**3,988**
2040	3,769	0	201	3,757	2,592	0	**10,319**
2045	0	0	0	0	0	0	**0**
Buildout	0	0	0	0	0	0	**0**
Total	**9,011**	**5,486**	**3,370**	**15,923**	**20,245**	**3,293**	**57,328**

Table 7-17 shows the Facility Expenditure Costs by Pressure Zone.

Table 7-18
Non-potable Water Master Plan Facility Expenditures by Pressure Zone ($000s)

Year	Tanks	Booster Pumps	Regulators	Transmission Pipelines	Distribution Pipelines	SPW Screening Treatment	**Total**
2600 and Below	4,039	3,675	731	10,537	4,237	0	**23,219**
2800	3,900	1,811	2,639	5,387	11,695	0	**25,430**
3000	1,073	0	0	0	4,314	3,293	**8,679**
Total	**9,011**	**5,486**	**3,370**	**15,923**	**20,245**	**3,293**	**57,328**

Costs for Facilities Needed for Supplemental Groundwater

Section 6 described Supplemental Groundwater extracted from the mouth of Edgar Canyon and San Timoteo Canyon that could be used in the non-potable water system. Table 7-18 shows the cost of the potential supplemental groundwater projects.

Table 7-19
Total Cost, Funding Sources and Facilities Fees for
Supplemental Groundwater from Edgar Canyon and San Timoteo Canyon

Major Facility Type	Total Cost (000s)	Funding Source		
		Facilities Fees (000s)	BCVWD	Developer
Bonita Vista Extraction Wells	$ 5,182	-	-	-
Edgar Canyon Extraction Wells and Collector Pipelines	$ 14,709	$ 14,709	-	-
San Timoteo Canyon Extraction Wells, Piping, Booster Pumps and 2400 Zone Tank	$ 4,682	$ 2,728	-	$ 1,954
Total	$ 24,574	$ 24,574	-	$ 1,954

Summary of Non-potable Water Facility Costs

The total program facilities cost is over $ 80.5 million to build-out. About $ 63.4 million, (79% of the total), is paid for by the development to accommodate the growth in demand and facilities through impact fees. About $ 17 million is funded through a combination of depreciation funds or other sources. Some of these other sources could include front footage fees for pipelines less than 16-in diameter put in by developers as part of a main extension agreement or installed as part of the tract development.

Note, in the total non-potable water facility costs described above, not included are any costs for additional treatment of recycled water (FAT) for use for indirect potable reuse. At such time that the City considers advanced treatment, the City and the District may discuss entering into a cost sharing agreement for the existing treatment facility upgrades, or additional, cost may be included in the City's retail price for recycled water.

Non-Potable Master Plan 2400 Pressure Zone

													Funding Sources						
													Facilties Fee		BCVWD Replacement Reserves		Developer		Priority
Project No.	Title/Description	Dia, in	Length, ft	Services Affected	Installation Condition, Blank if "Special" or not Tract	Unit Cost, $/ft	Pipeline Cost	Service Line Replacements and Tie ins	Subtotal	Contingency	Subtotal Construction Cost	Soft Costs	Total Project Cost	%	Amount	%	Amount	%	Amount	
NP-2400-0001	From future NT-2400-0001 (Fairway Canyon Ph IV Tank Site) to Oak Valley Parkway	12	3600	0	Tract	108	$ 388,800	$ -	$ 388,800	$ 58,320	$ 447,120	$ 58,126	$ 505,300	0%	$ -		$ -	100%	$ 505,300	2030
NP-2400-0002	From future NP-2400-0001, northwesterly to existing NP waterline in Palmer Avenue	12	3250	0		188	$ 611,000	$ -	$ 611,000	$ 183,300	$ 794,300	$ 103,259	$ 897,600	0%	$ -		$ -	100%	$ 897,600	2030
NP-2400-0003	From Palmer Avenue northwest to end of Fairway Canyon development (end of Crenshaw) to extraction well NP-2400-0002	12	2600	0		188	$ 488,800	$ -	$ 488,800	$ 146,640	$ 635,440	$ 82,607	$ 718,100	100%	$ 718,100		$ -	0%	$ -	2035
	Totals		6850	0			$ 1,488,600	$ -	$ 1,488,600	$ 388,260	$ 1,876,860	$ 243,992	$ 2,121,000	34%	$ 718,100		$ -	66%	$ 1,402,900	

Table 7-9
Non-potable Water Master Plan Pipelines
2400 Pressure Zone
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Non-potable Master Plan 2600 Pressure Zone

													Funding Sources						
													Facilties Fee		Capital Replacement		Developer		Priority
Project No.	Title/Description	Dia, in	Length, ft	Services Affected	Installation Condition, Blank if "Special" or not Tract	Unit Cost, $/ft	Pipeline Cost	Service Line Replacements and Tie ins	Subtotal	Contingency	Subtotal Construction Cost	Soft Costs	Total Project Cost	%	Amount	%	Amount	%	Amount	
NP-2600-0001	Oak Valley Parkway, from westerly end of existing 24" waterline, west to the existing City of Beaumont Lift station/ Tukwet Canyon Golf Course maintenance yard.	18	1900	0		283	$ 537,700	$ -	$ 537,700	$ 161,310	$ 699,010	$ 90,871	$ 789,900	25%	$ 197,475	0%	$ -	75%	$ 592,425	2023
NP-2600-0002	Oak Valley Parkway, from the west end of NP-2600-0001, west to the existing 16" waterline in Tukwet canyon Parkway.	18	4000	0		283	$ 1,132,000	$ -	$ 1,132,000	$ 339,600	$ 1,471,600	$ 191,308	$ 1,663,000	25%	$ 415,750	0%	$ -	75%	$ 1,247,250	2023
NP-2600-0003	In-Tract within a future Planning Area of the Fairway Canyon Development. In Sorenstam Drive, from Tukwet Canyon Parkway northwest to future Park Site.	12	2200	0	Tract	108	$ 237,600	$ -	$ 237,600	$ 35,640	$ 273,240	$ 35,521	$ 308,800	0%	$ -		$ -	100%	$ 308,800	2023
NP-2600-0004	In-Tract within a future Planning Area of the Fairway Canyon Development. In Sorenstam Drive, from the northwest end of NP-2600-0003 (future Park Site) to to NR-2600-0001 at the 2400 Zone Tank Site .	12	3100	0	Tract	108	$ 334,800	$ -	$ 334,800	$ 50,220	$ 385,020	$ 50,053	$ 435,100	0%	$ -		$ -	100%	$ 435,100	2025
NP-2600-0005	From the NR-2800-0004, along Cherry Valley Blvd west to I-10 freeway.	24	5000	0		369	$ 1,845,000	$ -	$ 1,845,000	$ 553,500	$ 2,398,500	$ 311,805	$ 2,710,400	100%	$ 2,710,400		$ -		$ -	2030
NP-2600-0006	From the end of NP-2600-0005, west across the bridge along Cherry Valley Blvd crossing I-10 freeway	24	1000	0		1107	$ 1,107,000	$ -	$ 1,107,000	$ 332,100	$ 1,439,100	$ 187,083	$ 1,626,200	100%	$ 1,626,200		$ -		$ -	2030
NP-2600-0007	Connection to Tukwet Canyon Golf Club, from Champions Blvd south to golf course	8	2000	0		142	$ 284,000	$ -	$ 284,000	$ 85,200	$ 369,200	$ 47,996	$ 417,200	100%	$ 417,200		$ -		$ -	2030
NP-2600-0008 Alt 1	From NT-2600-0001 Alternative 1, northwest to the future alignment of Potrero Blvd. Within the former Legacy Highlands project site.	24	5300	0	Tract	245	$ 1,298,500	$ -	$ 1,298,500	$ 194,775	$ 1,493,275	$ 194,126	$ 1,687,500	25%	$ 421,875		$ -	75%	$ 1,265,625	2040
NP-2600-0009	Along the future alignment of Potrero Blvd, from 4th Street south to NP-2600-0008.	24	2300	0		369	$ 848,700	$ -	$ 848,700	$ 254,610	$ 1,103,310	$ 143,430	$ 1,246,800	25%	$ 311,700		$ -	75%	$ 935,100	2025
NP-2600-0010	Along the future expanded right of way of Desert Lawn Drive, connecting the existing 24" waterlines on either side of the Tukwet Canyon Golf Course.	24	1000	0		553.5	$ 553,500	$ -	$ 553,500	$ 166,050	$ 719,550	$ 93,542	$ 813,100	100%	$ 813,100		$ -		$ -	2030
NP-2600-0011	Mountain Bridge Development - South Side Half Loop	12	3500	0	Tract	108	$ 378,000	$ -	$ 378,000	$ 56,700	$ 434,700	$ 56,511	$ 491,300		$ -			100%	$ 491,300	2030
NP-2600-0012	Mountain Bridge Development - North Side Half Loop	12	3300	0	Tract	108	$ 356,400	$ -	$ 356,400	$ 53,460	$ 409,860	$ 53,282	$ 463,200		$ -			100%	$ 463,200	2030
	Totals		38000	0		4028.5	$ 8,913,200	$ -	$ 8,913,200	$ 2,283,165	$ 11,196,365	$ 1,455,527	$ 12,652,500	55%	$ 6,913,700		$ -	45%	$ 5,738,800	

Table 7-10
Non-potable Water Master Plan Pipelines
2600 Pressure Zone
DRAFT - JUNE 2022

Non-potable Master Plan 2800 Pressure Zone

														Funding Sources					
														BCVWD Facilties Fee		Depreciation		Developer	
Project No.	Title/Description	Dia, in	Length, ft	Services Affected	Installation Condition, Blank if "Special" or not Tract	Unit Cost, $/ft	Pipeline Cost	Service Line Replacements and Tie ins	Subtotal	Contingency	Subtotal Construction Cost	Soft Costs	Total Project Cost	%	Amount	%	Amount	%	Amount
NP-2800-0001	In Beaumont Summit Station (Formerly Sunny Cal Egg Ranch), Cherry Valley Blvd to Brookside Ave	24	5200	0	Tract	$ 245	$ 1,274,000	$ -	$ 1,274,000	$ 191,100	$ 1,465,100	$ 190,463	$ 1,655,600	50%	$ 827,800		$ -	50%	$ 827,800
NP-2800-0002	California Ave., 1st Street south to Hwy 79	12	4700	0		$ 188	$ 883,600	$ -	$ 883,600	$ 265,080	$ 1,148,680	$ 149,328	$ 1,298,100	0%	$ -		$ -	100%	$ 1,298,100
NP-2800-0003	Potrero Blvd, California Ave east to Manzanita Park Rd	12	4000	0	Tract	$ 162	$ 648,000	$ -	$ 648,000	$ 97,200	$ 745,200	$ 96,876	$ 842,100		$ -		$ -	100%	$ 842,100
NP-2800-0004	Potrero Blvd, California Ave west to Veile St	12	2100	0	Tract	$ 108	$ 226,800	$ -	$ 226,800	$ 34,020	$ 260,820	$ 33,907	$ 294,800		$ -		$ -	100%	$ 294,800
NP-2800-0005	Veile St., 1st St. south to Potrero Blvd	24	1000	0	Tract	$ 245	$ 245,000	$ -	$ 245,000	$ 36,750	$ 281,750	$ 36,628	$ 318,400	25%	$ 79,600		$ -	75%	$ 238,800
NP-2800-0006	In CoB WWTP site, from 2600 to 2800 Zone Booster Pump (NPB 2600-0001) to 4th St.	20	650	0		$ 618	$ 401,700	$ -	$ 401,700	$ 120,510	$ 522,210	$ 67,887	$ 590,100	100%	$ 590,100		$ -		$ -
NP-2800-0007	1st St, from Commerce Way east to Highland Springs Ave	16	2100	0		$ 244	$ 512,400	$ -	$ 512,400	$ 153,720	$ 666,120	$ 86,596	$ 752,800	100%	$ 752,800		$ -		$ -
NP-2800-0008	Highland Springs Ave, 2nd St to 1st St.	12	850	0		$ 282	$ 239,700	$ -	$ 239,700	$ 71,910	$ 311,610	$ 40,509	$ 352,200	100%	$ 352,200		$ -		$ -
NP-2800-0009	Within Palm Ave, Crossing 6th Street to connect existing waterlines	8	300	0		$ 284	$ 85,200	$ -	$ 85,200	$ 25,560	$ 110,760	$ 14,399	$ 125,200	100%	$ 125,200		$ -		$ -
NP-2800-0010	Noble Cr. Meadows, Cougar Way to Oak Valley Pkwy	8	3500	0	Tract	$ 72	$ 252,000	$ -	$ 252,000	$ 37,800	$ 289,800	$ 37,674	$ 327,500		$ -		$ -	100%	$ 327,500
NP-2800-0011	Ring Ranch Road north to Oak Valley Parkway 750 w/o Elm Ave., within future development	8	4500	0	Tract	$ 72	$ 324,000	$ -	$ 324,000	$ 48,600	$ 372,600	$ 48,438	$ 421,100		$ -		$ -	100%	$ 421,100
NP-2800-0012	Oak Valley Pkwy, from Oak View Dr. east to 750 ft w/o Elm Ave.	12	2500	0		$ 188	$ 470,000	$ -	$ 470,000	$ 141,000	$ 611,000	$ 79,430	$ 690,500	100%	$ 690,500		$ -		$ -
NP-2800-0013	Oak Valley Pkwy 750 ft w/o Elm Ave. to Noble Cr. Meadows	12	1000	0		$ 188	$ 188,000	$ -	$ 188,000	$ 56,400	$ 244,400	$ 31,772	$ 276,200	100%	$ 276,200		$ -		$ -
NP-2800-0014	Oak Valley Parkway from Noble Cr. Meadows east to Palm Ave	8	3800	0		$ 213	$ 809,400	$ -	$ 809,400	$ 242,820	$ 1,052,220	$ 136,789	$ 1,189,100	100%	$ 1,189,100		$ -		$ -
NP-2800-0015	Edgar Ave from Oak Valley Pkwy south to 13th St to serve Mt. View Cemetery	8	1300	0		$ 178	$ 230,750	$ -	$ 230,750	$ 69,225	$ 299,975	$ 38,997	$ 339,000	100%	$ 339,000		$ -		$ -
NP-2800-0016	7th Street from Veile Ave southwest to California Ave	8	2250	0		$ 142	$ 319,500	$ -	$ 319,500	$ 95,850	$ 415,350	$ 53,996	$ 469,400	100%	$ 469,400		$ -		$ -
NP-2800-0017	Along Oak Valley Pkwy from Palm Ave to Cherry Ave	12	2300	0		$ 188	$ 432,400	$ -	$ 432,400	$ 129,720	$ 562,120	$ 73,076	$ 635,200	100%	$ 635,200		$ -		$ -
NP-2800-0018	Along Oak Valley Pkwy from Oak View Dr to Golf Course Dr	12	1300	0		$ 282	$ 366,600	$ -	$ 366,600	$ 109,980	$ 476,580	$ 61,955	$ 538,600	50%	$ 269,300		$ -	50%	$ 269,300
NP-2800-0019	From 7th Street @ California Ave, east to Edgar Ave, north to 8th St, east to Orange Ave (Connecting to NP-2800-0026)	8	2750	0		$ 142	$ 390,500	$ -	$ 390,500	$ 117,150	$ 507,650	$ 65,995	$ 573,700	100%	$ 573,700		$ -		$ -
NP-2800-0020	Along 4th Street from Veile Ave to Rangel Park	8	1300	0		$ 142	$ 184,600	$ -	$ 184,600	$ 55,380	$ 239,980	$ 31,197	$ 271,200	100%	$ 271,200		$ -		$ -
NP-2800-0021	Along 2nd Street from Pennsylvania Ave, south to 1st St to the existing pipeline	8	2200	0		$ 142	$ 312,400	$ -	$ 312,400	$ 93,720	$ 406,120	$ 52,796	$ 459,000		$ -		$ -	100%	$ 459,000
NP-2800-0022	Within former Legacy Highlands project site, from HWY 79, west approximately 4,000 LF (From NP-2800-0002 to NP-2800-0024)	12	4000	0	Tract	$ 108	$ 432,000	$ -	$ 432,000	$ 64,800	$ 496,800	$ 64,584	$ 561,400		$ -		$ -	100%	$ 561,400
NP-2800-0023	Within former Legacy Highlands project site, from Veile Avenue, west approximately 3,300 LF (From NP-28000-0005 to NP-2800-0024). Along the future alignment of Potrero Blvd	24	3300	0	Tract	$ 245	$ 808,500	$ -	$ 808,500	$ 121,275	$ 929,775	$ 120,871	$ 1,050,700	25%	$ 262,675		$ -	75%	$ 788,025

Table 7-11
Non-potable Water Master Plan Pipelines
2800 Pressure Zone
DRAFT - JUNE 2022

Non-potable Master Plan 2800 Pressure Zone

														Funding Sources					
														BCVWD Facilties Fee		Depreciation		Developer	
Project No.	Title/Description	Dia, in	Length, ft	Services Affected	Installation Condition, Blank if "Special" or not Tract	Unit Cost, $/ft	Pipeline Cost	Service Line Replacements and Tie ins	Subtotal	Contingency	Subtotal Construction Cost	Soft Costs	Total Project Cost	%	Amount	%	Amount	%	Amount
NP-2800-0024	Within former Legacy Highlands project site, from proposed NP-2800-0022 north to proposed NP-2800-0023	24	3200	0	Tract	$ 245	$ 784,000	$ -	$ 784,000	$ 117,600	$ 901,600	$ 117,208	$ 1,018,900	25%	$ 254,725		$ -	75%	$ 764,175
NP-2800-0025	Within former Legacy Highlands project site, from proposed NP-2800-0022 west to proposed NP-2800-0026 approximately 2,400 LF	12	2400	0	Tract	$ 108	$ 259,200	$ -	$ 259,200	$ 38,880	$ 298,080	$ 38,750	$ 336,900		$ -		$ -	100%	$ 336,900
NP-2800-0026	Within former Legacy Highlands project site, from proposed NP-2800-0025 south to proposed NP-2800-00026 approximately 2,800 LF	8	2800	0	Tract	$ 72	$ 201,600	$ -	$ 201,600	$ 30,240	$ 231,840	$ 30,139	$ 262,000		$ -		$ -	100%	$ 262,000
NP-2800-0027	Within former Legacy Highlands project site, from proposed NP-2800-0025 northwest to proposed NP-2800-0028 approximately 1,150 LF	12	1150	0	Tract	$ 108	$ 124,200	$ -	$ 124,200	$ 18,630	$ 142,830	$ 18,568	$ 161,400		$ -		$ -	100%	$ 161,400
NP-2800-0028	Within former Legacy Highlands project site, from proposed NP-2800-0027 north to proposed NP-2800-0029 approximately 1,900 LF	12	1900	0	Tract	$ 108	$ 205,200	$ -	$ 205,200	$ 30,780	$ 235,980	$ 30,677	$ 266,700		$ -		$ -	100%	$ 266,700
NP-2800-0029	Within former Legacy Highlands project site, from proposed NP-2800-0028 east to proposed NP-2800-0023 approximately 1,350 LF. Along the future alignment of Potrero Blvd	12	1350	0	Tract	$ 108	$ 145,800	$ -	$ 145,800	$ 21,870	$ 167,670	$ 21,797	$ 189,500		$ -		$ -	100%	$ 189,500
NP-2800-0030	Within former Legacy Highlands project site, from proposed NP-2800-0028 northeast to the future alignment of Potrero Blvd, approximately 5,300 LF	8	5300	0	Tract	$ 72	$ 381,600	$ -	$ 381,600	$ 57,240	$ 438,840	$ 57,049	$ 495,900		$ -		$ -	100%	$ 495,900
NP-2800-0031	Within former Legacy Highlands project site, from proposed NP-2800-0028 northwest to the proposed NP-2800-0030, approximately 5,300 LF. Along the future alignment of Potrero Blvd	8	3400	0	Tract	$ 72	$ 244,800	$ -	$ 244,800	$ 36,720	$ 281,520	$ 36,598	$ 318,200		$ -		$ -	100%	$ 318,200
	Totals		78400	0			$ 12,383,450	$ -	$ 12,383,450	$ 2,731,530	$ 15,114,980	$ 1,964,947	$ 17,081,400	47%	$ 7,958,700		$ -	53%	$ 9,122,700

Table 7-11
Non-potable Water Master Plan Pipelines
2800 Pressure Zone
DRAFT - JUNE 2022

Non-potable Master Plan 3000 Pressure Zone

													Funding Sources						
													Facilties Fee		BCVWD Replacement Reserves		Developer		Priority
Project No.	Title/Description	Dia, in	Length, ft	Services Affected	Installation Condition, Blank if "Special" or not Tract	Unit Cost, $/ft	Pipeline Cost	Service Line Replacements and Tie ins	Subtotal	Contingency	Subtotal Construction Cost	Soft Costs	Total Project Cost	%	Amount	%	Amount	%	Amount	
NP-3000-0001	At the NCRF Phase II Site, from NT-2800-0001 south to Lincoln Street.	12	1050	0		188	$ 197,400	$ -	$ 197,400	$ 59,220	$ 256,620	$ 33,361	$ 290,000	100%	$ 290,000		$ -		$ -	2025
NP-3000-0002	In Lincoln Street, from NCRF Phase II Site east to Bellflower Avenue.	12	6600	0		188	$ 1,240,800	$ -	$ 1,240,800	$ 372,240	$ 1,613,040	$ 209,695	$ 1,822,800	100%	$ 1,822,800		$ -		$ -	2025
NP-3000-0003	Brookside Ave, from Bellflower Ave to Highland Springs Ave	8	1200	0		142	$ 170,400	$ -	$ 170,400	$ 51,120	$ 221,520	$ 28,798	$ 250,400	100%	$ 250,400		$ -		$ -	2030
NP-3000-0004	Bellflower Ave, from Brookside Avenue north to Tank NT-3000-0001	12	5400	0		188	$ 1,015,200	$ -	$ 1,015,200	$ 304,560	$ 1,319,760	$ 171,569	$ 1,491,400	100%	$ 1,491,400		$ -		$ -	2030
NP-3000-0005	In Cherry Valley Blvd, from Bellflower Ave to Overland Trail, then Overland Trail to Chisolm Trail	8	2200	0		142	$ 312,400	$ -	$ 312,400	$ 93,720	$ 406,120	$ 52,796	$ 459,000	100%	$ 459,000		$ -		$ -	2030
	Totals		16450	0			$ 2,936,200	$ -	$ 2,936,200	$ 880,860	$ 3,817,060	$ 496,218	$ 4,313,600	100%	$ 4,313,600		$ -		$ -	

Table 7-12
Non-potable Water Master Plan Pipelines
3000 Pressure Zone
DRAFT - JUNE 2022

Non-potable Water Master Plan Baseline Facility Needs Summary (ENR CCI 12133)													
Project No.	Year Needed	Title	Description	Cost		Funding Source %					Funding Cost $	
				Construction	Total Project Cost, incl. Land Acquisition	Capacity Charges (Facilities Fees)	Capital Replacement Reserves	Rates & General Fund	Developer Reimbursed	Grants & Loans	Capacity Charges (Facilities Fees)	Other
NW-2400-0001	2030	San Timoteo Creek Non-Potable Water Extraction Well	Installation of a series of extraction wells outside of the Beaumont Basin to recover underflow in San Timoteo Creek, the bulk of which is from the City of Beaumont's Wastewater Effluent Discharge in Cooper Creek. Construct Booster Pumping station to boost well flow into 2400 Zone. An environmental mitigation flow of 1.8 mgd is requirement for the City in Cooper Creek but this flow can be recovered downstream. Wells would pump to NT-2400-0001. (Phase 1)	$ 1,841,500	$ 1,954,000	100%	0%	0%	0%	0%	$ 1,954,000	$ -
NW-2400-0002	2035	San Timoteo Creek Non-Potable Water Extraction Well	Installation of a series of extraction wells outside of the Beaumont Basin to recover underflow in San Timoteo Creek, the bulk of which is from the City of Beaumont's Wastewater Effluent Discharge in Cooper Creek. Construct Booster Pumping station to boost well flow into 2400 Zone. An environmental mitigation flow of 1.8 mgd is requirement for the City in Cooper Creek but this flow can be recovered downstream. Wells would pump to NT-2400-0001. (Phase 2)	$ 2,616,000	$ 2,728,500	100%	0%	0%	0%	0%	$ 2,728,500	$ -
NT-2400-0001	2030	100,000 Gallon 2400 PZ Non-Potable Tank	100,000 Gallon 2400 PZ NPW Tank located within Fairway Canyon. Construct with Extraction well (NW-2400-0001) & 2600 Pressure Regulator (NR-2600-0001)	$ 195,000	$ 270,000	100%	0%	0%	0%	0%	$ 270,000	$ -
NR-2600-0001	2030	2600 Zone Non-Potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2600 Zone to 2400 Zone within Fairway Canyon Phase IV to be located at the 2400 Zone Tank Site (NT-2400-001). Install flow meter to measure flow to 2400 Zone. Install flow control valve to limit flow to Max Day of 2400 Zone.	$ 365,600.00	$ 365,600.00	100%	0%	0%	0%	0%	$ 365,600	$ -
NR-2600-0002	2025	2600 Zone Non-Potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2600 Zone to 2400 Zone along Palmer Avenue in the vicinity of the existing 2520 Zone to 2370 Zone Potable Pressure Regulating Station. Install flow meter to measure flow to 2400 Zone.	$ 365,600.00	$ 365,600.00	100%	0%	0%	0%	0%	$ 365,600	$ -
NT-2600-0001 Alternative 1	2040	2600 Zone Non-Potable Water 2 MG Tank	1.5 MG 2600 Zone Non-potable Water Tank located in the future (tentative) Legacy Highlands Project Site. Fed by pressure regulator NR-2800-0003 (Alternative 1).	$ 3,656,250.00	$ 3,768,750.00	100%	0%	0%	0%	0%	$ 3,768,750	$ -
NT-2600-0001 Alternative 2 (Not included in total cost)	2040	2600 Zone Non-Potable Water 2 MG Tank	1.5 MG 2600 Zone Non-potable Water Tank located in the future (tentative) Legacy Highlands Project Site. Fed by pressure regulator NR-2800-0003 (Alternative 2).	$ 3,656,250.00	$ 3,768,750.00	100%	0%	0%	0%	0%	$ 3,768,750	$ -
NBP-2600-0001	2025	Non-Potable Booster Pump Station at CoB Wastewater Treatment Plant	Booster Pump Station on City of Beaumont Wastewater Treatment Plant Site to pump recycled water from CoB WWTP effluent to 2800 Non-potable Water Zone.	$ 3,102,100.00	$ 3,102,100.00	100%	0%	0%	0%	0%	$ 3,102,100	$ -

Non-potable Water Master Plan Baseline Facility Needs Summary (ENR CCI 12133)													
Project No.	Year Needed	Title	Description	Cost		Funding Source %					Funding Cost $	
				Construction	Total Project Cost, incl. Land Acquisition	Capacity Charges (Facilities Fees)	Capital Replacement Reserves	Rates & General Fund	Developer Reimbursed	Grants & Loans	Capacity Charges (Facilities Fees)	Other
NBP-2600-0002	2025	Non-Potable Booster Pump Station at CoB Wastewater Treatment Plant Expansion	Booster Pump Station on City of Beaumont Wastewater Treatment Plant Site to pump recycled water from CoB WWTP effluent to 2800 Non-potable Water Zone. Expansion	$ 573,300.00	$ 573,300.00	100%	0%	0%	0%	0%	$ 573,300	$ -
NR-2800-0001	2025	2800 Zone Non-Potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2800 Zone to 2600 Zone located at Deodar Drive northeast of the non-potable waterline under the 1-10 freeway. Install flow meter to measure flow to 2600 Zone.	$ 812,500.00	$ 812,500.00	100%	0%	0%	0%	0%	$ 812,500	$ -
NR-2800-0002	2025	2800 Zone Non-Potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2800 Zone to 2600 Zone at the intersection (NE Corner) of 4th St & Potrero Blvd. Install flow meter to measure flow to 2600 Zone.	$ 812,500.00	$ 812,500.00	100%	0%	0%	0%	0%	$ 812,500	$ -
NR-2800-0003	2040	2800 Zone Non-Potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2800 Zone to 2600 Zone to be located at the 2600 Zone Tank Site (NT-2600 0001) in the future (tentative) Legacy Highlands Devlopment. Install flow meter to measure flow to 2600 Zone Tank. Install flow control valve to limit flow to Maximum Day demand	$ 201,012.50	$ 201,012.50	100%	0%	0%	0%	0%	$ 201,013	$ -
NR-2800-0004 - TENTATIVE	2035	2800 Zone Non-potable Regulation and Metering Station	Non-potable Water Pressure Regulating Station 2800 Zone to 2600 Zone within Beaumont Summit Station (Formerly Sunny Cal Egg Ranch) Development. Install flow meter to measure flow to 2600 Zone.	$ 812,500.00	$ 812,500.00	100%	0%	0%	0%	0%	$ 812,500	$ -
NT-2800-0001	2025	2 MG 2800 PZ Non-Potable Tank	2 MG 2800 PZ NPW Tank located within the Noble Creek Recharge Facility Phase II. Construct with Booster Pump (NBP-2800-0001)	$ 3,900,000.00	$ 3,900,000.00	100%	0%	0%	0%	0%	$ 3,900,000	$ -
NBP-2800-0001	2030	2800 Zone Non-potable Booster Pump Station at the Noble Creek Recharge Facilities	2800 to 3000 Zone Booster Pump Station located at the Noble Creek Recharge Facility to pump recycled water from 2800 NP to 3000 Non-potable Water Zone.	$ 1,810,575.00	$ 1,810,575.00	100%	0%	0%	0%	0%	$ 1,810,575	$ -
NM-2800-0001	2030	Non-potable Screening Facility	Construct Transfer Pump Station and Screening Facility on Imported Water Pipeline at 2800 Zone Tank.3 @12500 gpm,TDH =60ft ,30 HP and 3 300 micron fine screens @3000 gpm	$ 2,902,692.00	$ 2,902,692.00	100%	0%	0%	0%	0%	$ 2,902,692	$ -
NM-2800-0002	2035	Non-potable Screening Facility Expansion	Add fourth pump 2000 gpm, 60 ft TDH, 50 HP	$ 390,000.00	$ 390,000.00	100%	0%	0%	0%	0%	$ 390,000	$ -

Non-potable Water Master Plan Baseline Facility Needs Summary (ENR CCI 12133)													
Project No.	Year Needed	Title	Description	Cost		Funding Source %					Funding Cost $	
				Construction	Total Project Cost, incl. Land Acquisition	Capacity Charges (Facilities Fees)	Capital Replacement Reserves	Rates & General Fund	Developer Reimbursed	Grants & Loans	Capacity Charges (Facilities Fees)	Other
NT-3000-0001	2035	3000 PZ Non-Potable 100,000 Gallon Tank	275,000 Gallon 3000 PZ NPW Tank located north of Highland Springs Development in the vicinity of the existing Potable 3040 PZ Hydropneumatic Tank.	$ 1,072,500.00	$ 1,072,500.00	100%	0%	0%	0%	0%	$ 1,072,500	$ -
WR - Nitrate GW Extraction	2035	Bonita Vista Nitrate Groundwater Extraction System	Construct shallow extraction wells and collector piping system at Bonita Vista Existing Well Locations	$ 1,024,530	$ 5,182,650	100%	0%	0%	0%	0%	$ 5,182,650	$ -
WR - Nitrate GW Extraction	2035	Edgar Canyon Nitrate Groundwater Extraction System	Construct shallow extraction wells and collector piping system at mouth of Edgar Canyon to extract nitrate contaminated groundwater for the non-potable water system.	$ 2,821,845	$ 14,709,225	100%	0%	0%	0%	0%	$ 14,709,225	$ -
			Total	**$ 29,276,005**	**$ 45,734,005**						**$ 45,734,005**	

Section 8

Priorities, Funding, and Implementation

Non-Potable Water Supply Priorities

Immediate Priorities

BCVWD's immediate priorities are:

- Execute an agreement with the City of Beaumont for distribution of the recycled water. A draft has been developed which is under review.
- Design and Construct the Booster Pump Station at or near the wastewater treatment plant site to boost the recycled water from the treatment facility into the 2800 NP Zone system.
- Installation of pressure regulating stations in the 2800 Pressure Zone to serve the 2600 and Lower Non-potable Water Pressure Zones and a pressure regulator in the 2600 Pressure Zone to serve the 2400 Non-potable Pressure Zone.
- Complete and obtain approval of a Title 22 Engineering Report for the non-potable water distribution system from the DDW and the RWQCB and obtain a permit for distribution of recycled water.
- Identify the site managers for the reuse sites and ensure that the site managers are properly trained.
- Isolate the potable water system from the non-potable water system in the 2600 and lower pressure zones (south of I-10 in Tournament Hills and Fairway Canyon). Perform cross-connection testing to ensure the potable water system is completely isolated from the non-potable water system.
- Develop a rate structure for non-potable water.

Near-term Priorities

Installation of a fine screening facility on the imported SPW pipeline at the 2800 Presure Zone Non-potable Water Tank site and introduction of SPW into the 2800 Pressure Zone Tank is a project that should be completed within the next 5 years.

Facilities Needed for Build-out

The proposed facilities needed to accommodate projected development to build-out of BCVWD's service area are identified and summarized in Section 7 by pressure zone, the year

needed, funding source, etc. The major transmission and distribution facilities needed for each pressure zone are also summarized in Section 7 by pressure zone along with estimated year needed, funding source. etc.

Funding Sources

There are a number of funding sources for the master plan projects; these are described briefly in the subsections that follow:

Federal and State Grants and Loans

There are a number of State and federal grant and loan programs available for recycled water. As projects are being considered for implementation, the availability of grants and low interest loans should be investigated.

US Department of Agriculture, Rural Development (USDA RD).

To qualify, applicants must be unable to obtain commercial credit on reasonable terms. This program helps very small, financially distressed rural communities extend and improve water and waste treatment facilities that serve local households and businesses. Projects funded include wastewater collection, transmission, treatment and disposal. Water recycling is not specifically mentioned so it is not known if this would be eligible. Funds can be used for construction, land acquisition, legal fees, engineering fees, capitalized interest, equipment, initial operation and maintenance costs, project contingencies, and any other cost that is determined by the Rural Development to be necessary for the completion of the project. Projects must be primarily for the benefit of rural users. The funding is limited to communities of less than 10,000 people.

It is doubtful BCVWD would qualify for this type of financial assistance due to the size of the City of Beaumont where almost all of the non-potable water facilities are located.

Clean Water State Revolving Fund

The State Water Resources Control Board (SWRCB) Division of Finance administers the Clean Water State Revolving Fund (CWSRF) by providing affordable, low interest financing for a wide variety of projects including publicly owned treatment works, non-point source (NPS) projects, and estuary projects, decentralized wastewater treatment systems, storm water projects, water conservation, watershed projects, energy conservation, and water reuse projects.

Extra consideration is given to disadvantaged communities[1] and severely disadvantaged communities.[2] Although a portion of the City of Beaumont (11th St to 1st St., Pennsylvania Ave. to Viele/Minnesota St.) are classified by CalEPA as a disadvantage community under SB 535, the 2020 median annual household incomes in the City of Beaumont and Cherry Valley were $88,932 and $70,741, respectively, compared the California median annual income of $78,672. It is uncertain if any of the non-potable water projects would be eligible for special disadvantaged community consideration, but it should be explored.

Grants are available; the loans are typically 20-year payoff with very low interest rate – around 2%. Projects funded by the CWSRF Program must comply with certain federal laws known as "cross-cutters." These cross-cutters include a number of environmental factors that must be addressed in the environmental review process. A "CEQA-plus" document is required which addresses the "cross-cutters."

There are also grants and low interest loans available from the Water Recycling Funding Program (WRFP) for water recycling projects also under the SWRCB.

U.S. Bureau of Reclamation (USBR)

Title XVI of P.L. 102-575, as amended (Title XVI) provides authority for the USBR water recycling and reuse program, titled "Title XVI." Through the Title XVI program, USBR identifies and investigates opportunities to reclaim and reuse wastewaters and naturally impaired ground and surface water in the 17 Western States and Hawaii. Title XVI includes funding for the planning, design, and construction of water recycling and reuse projects, on a project specific basis, in partnership with local government entities, such as BCVWD.

The USBR has historically provided funding opportunities for Title XVI water recycling projects under the Water Infrastructure Improvements for the Nation Act (WIIN) (P.L. 114-322) signed into law on 12/16/2016. This funding opportunity was for sponsors of water recycling projects that have completed a Title XVI Feasibility Study that has been reviewed by and approved by USBR. USBR can provide up to 25% funding for planning, design and construction; the remaining 75% would come from BCVWD and other funding sources. Applications for current funding recently closed on March 15, 2022. BCVWD did not meet this deadline, but there may likely be re-authorizations in future years which would give BCVWD time to apply.

In reviewing the USBR Feasibility Report requirements, USBR indicates that feasibility studies for other loan and grant applications, e.g., SRF, may meet USBR requirements with little or no modification. USBR only requires a "mapping" of their requirements in their Manual WTR 11-01. BCVWD's "Recycled Water Facilities Planning Report for Recycled Water Supply Pipeline and

[1] The entire water service area median household income is less than 80% of the statewide median annual household income.

[2] The entire water service area median household income is less than 60% of the statewide median annual household income.

Pump Station" contains most, if not all, of the information required by the USBR. BCVWD should maintain periodic contact with USBR in their Southern California Area office in Temecula.

Other California Water Funding Bond Issues

There may be other grant opportunities through SAWPA etc that come from other bond issues. The District is continuously working with its grant consultant for additional funding.

Other Direct Loans

BCVWD could take out a conventional loan for specific projects or project oversizing that are not funded from other sources. The District had such a loan to help pay for the construction of the last phase of the non-potable water system. That loan has since been repaid.

The concern with these types of loans is the interest rate is considerably higher than CWSRF and similar revolving fund loans. However, this could be a source of short term "bridge funding" funding should an emergency arise.

Bonds

There are several types of bond funding available to the District:

- General Obligation Bonds
- Revenue Bonds
- Community Facilities District (CFD) Bonds

Bonds could be issued by the District; with the bond issue including the construction and project engineering and administration costs, construction and permitting costs, plus interest.

General Obligation Bonds

General Obligation Bonds are repaid with taxes, particularly property tax, and require a two-thirds voter approval which is generally difficult to obtain. As a result, this type of funding is probably not viable.

Revenue Bonds

Revenue bonds are repaid from the revenue obtained from water sales. Revenue bonds only require a simple majority voter approval. Since revenue bonds are backed by water revenues, the procedures in Proposition 218 are likely required to be followed. BCVWD could issue revenue bonds to cover facility construction.

Community Facilities District (CFD) Bonds

Community Facilities District ("Mello Roos") Bonds could be issued by the District to fund new construction, but this too would require a 2/3 vote of residents within the CFD boundaries. (Note that if there are less than 12 residents, the parcel landowners vote.) The City of Beaumont has used CFD funding extensively for water and recycled water infrastructure and much of the existing system has been paid with those bond funds. Due to the requirements for 2/3 vote, it is unlikely CFD Bonds are viable.

Facilities Fees (Capacity Charges)

Facilities fees or impact fees are paid by industrial, commercial and residential developers to fund the cost of the impacts of their developments on the District's non-potable water system. The District has collected facilities fees since the early 1980's. Facilities fees pay for oversizing of pipelines, new non-potable water wells, tanks, transmission mains, etc., needed to serve new developments.

The facility fee charges must be supported by nexus studies documenting the needed facilities to accommodate growth and the costs for the facilities. This non-potable water master plan provides such documentation.

Facility Depreciation

BCVWD sets aside funds to refurbish, rehabilitate and replace aging facilities as part of its non-potable water rate structure. This fund can be used for replacing aging pipelines up to their existing size (any oversizing could be funded from facilities fees); rehabilitating, reconditioning, redevelopment of non-potable water wells; painting and refurbishment of tanks; and replacing and rehabilitating pumps, etc., i.e., anything that extends the useful life of a capital asset. BCVWD's non-potable water system piping and transmission facilities are all relatively new (constructed over the last 15 years or so) and will not require replacement or rehabilitation for many years; but money should be set aside for this eventuality. Tanks, pumps, and non-potable wells will require rehabilitation over time to maintain these assets fully functional.

Front Footage Fees

BCVWD collects front footage fees for parcels connecting to or fronting along existing non-potable water pipelines based on the property length along the property's street frontage. For corner parcels, front footage fees are collected for both street frontages. The front footage fee rates are established by BCVWD's Board of Directors and published in BCVWD's Rules and Regulations for Water Service.

Implementation

- The first step in implementation of this Non-Potable Water Master Plan is to formally adopt the master plan, recognizing that the master plan will need to be reviewed and updated periodically – perhaps every 10 years. The adopted master plan should then be placed on the District's website for access by the public and developers.
- Prior to construction of any of the facilities identified in the Master Plan. CEQA documentation must be completed.
- The master plan facilities should be incorporated into the District's Geographical Information System (GIS).
- A facilities fee study has been authorized by the Board. Prior to the adoption of the revised facilities fees the Board should conduct one or two workshops with the public and developers to seek their input. The updated facilities fees should be adopted by the Board as soon as possible. The facilities fees should be reviewed the next time this master plan is updated.
- The required non-potable water facilities identified in this non-potable water master plan have been included in BCVWD's most recent Capital Improvement Program (CIP). This CIP should be periodically reviewed vis-à-vis this master plan.
- The current water rate structure, published in the District's Rules and Regulations, was adopted on March 1, 2020 and extends through December 2024. If the rates need to be revised at any time prior to the end of 2024, the procedures required by Proposition 218 will need to be followed.