OLIVENHAIN
Municipal Water District

2024 POTABLE AND RECYCLED WATER MASTER PLAN UPDATE

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Acknowledgements

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Introduction

Olivenhain Municipal Water District (OMWD) is a retail potable and recycled water purveyor, and wastewater utility for water customers in North San Diego County. OMWD was organized and is operating pursuant to Water Code Sections 71000 et seq., and was incorporated on April 9, 1959. Potable water storage tanks, pipelines, and appurtenant facilities were constructed starting in 1960, to distribute water from connections to the San Diego County Water Authority (CWA) regional aqueduct system. Today the potable distribution system covers the developed portions of OMWD, as shown in Figure 1. A hydraulic schematic of the existing potable system is shown in Figure 2. Raw water is supplied by CWA and is treated at the OMWD-owned and operated David C McCollom Water Treatment Plant (DCMWTP), with a capacity of 34 million gallons per day (MGD). Several treated water interconnections with CWA and other agencies provide water supply redundancy. OMWD serves an average of approximately 17,000 acre-feet per year (15 MGD) of potable water.

OMWD operates two recycled water service areas known as the Northwest Quadrant (including the Mahr Zone, Quail Gardens Zone, Village Park Zone, and the Manchester Avenue Zone) and the Southeast Quadrant (including the 4S and San Dieguito Zones). The entire recycled system is shown in Figure 3, which shows that only portions of the developer areas of OMWD are served by recycled water. The Mahr/Quail Gardens Zone, Village Park Zone, and Southeast Quadrant are shown in more detail in Figures 4, 5, and 6, respectively. Hydraulic schematics of the recycled systems for the Mahr and Quail Gardens Zones, Village Park Zone, and Southeast Quadrant are shown in Figure 7, 8, and 9, respectively. No hydraulic schematic has been developed for Manchester Zone yet, as the system was recently constructed.

On average, 2.5 MGD of recycled water is provided to OMWD customers for the irrigation of homeowner's association common areas, schools, parks, streetscapes, and golf courses, representing approximately 15 percent of total daily demands. In the Northwest Quadrant, recycled water is supplied by Vallecitos Water District and the San Elijo Joint Powers Authority (SEJPA). Recycled water for Manchester Avenue is supplied by SEJPA, and the Southeast Quadrant is supplied by the OMWD 4S Ranch Water Reclamation Facility (WRF), with a capacity of 2.0 MGD, the Rancho Santa Fe Community Services District and two City of San Diego recycled water connections. A summary of the recycled quadrants and associated zones and supply source is provided in Table 1.

Table 1 Recycled Water Services Areas and Sources

Quadrant	Zone	Source
Northwest	Mahr	Vallecitos Water District's (VWD), Mahr Reservoir
	Quail Gardens	San Elijo Joint Powers Authority (SEJPA), Leucadia Boulevard Connection
	Village Park	SEJPA, Wiegand Tank (owned by OMWD)
	Manchester	SEJPA, Manchester Boulevard Connection
Southeast	4S	4S Ranch Water Reclamation Facility
	San Dieguito	Rancho Santa Fe Community Services District's Santa Fe Valley Water Reclamation Facility; City of San Diego Connections 1 and 2

A comprehensive Potable Water Master Plan and Capital Improvement Program (CIP) was completed in 2000 (Boyle, 2000). This master plan included an update of the hydraulic model and water system analysis. Subsequently, the model was maintained by consultants and utilized to evaluate new development and specific operations. In 2006, the Potable Master Plan and CIP was updated (CH2M Hill,

2006) and potable water pipeline rehabilitations and replacements were prioritized based on age, material, and pressure. The 2006 Comprehensive Master Plan also summarized previous studies and evaluated the rehabilitation and replacement of the recycled water facilities and wastewater collection systems. A series of recycled water planning studies were completed for the recycled water systems starting in the 1990s. Focused planning studies were completed for the Village Park recycled water system, in the Northwest Quadrant in the early 2000s. Potable and Recycled Water Master Plans were then completed in 2011 (AECOM,2011) and 2015 (DLM Engineering,2015) but they focused on specific projects, and did not include an update or calibration of the hydraulic model .

As OMWD has approached build out, has a well-developed potable water treatment, conveyance, and distribution system some key infrastructure is approaching the end of its useful life. This current master plan is being undertaken to update and calibrate the hydraulic models and develop a 10-year prioritized CIP to cost effectively provide reliable potable and recycled service to OMWD customers. CIP projects are developed to address the needs of OMWD to reliably serve its customers with potable and recycled water in a cost-effective manner. The projects are developed in response to drivers, such as supply needs, regulatory changes, or infrastructure condition. Projects are prioritized based on risk, reviewing the likelihood of an event and the potential consequence of that event.

This master plan update summarizes efforts in the following areas, cumulating in a 10-year CIP:

1. A brief description of the master planning methodology
2. A summary of supply considerations and regulatory drivers
3. Brief summaries of the hydraulic modeling and planning criteria
4. A summary of results from infrastructure planning and condition assessment programs and needs identified for each system
5. A summary of the 10-year CIP for both the potable and recycled water systems

Methodology

Typically, water utilities update their master plans every five to six years to review and address changes in land use, water use and sewer flows, regulatory requirements, planning criteria, infrastructure condition, and new operational issues. The master plan update is then used to update and re-prioritize the capital improvement plan and to update project costs. The master plans support the Finance Department in cost-of-service-studies, rate setting, calculation of capacity fees, and determination of bonding requirements. The master plan serves as a guide for the District's reference when revisiting the capital improvement budget in future years, and it is expected that project priorities and budgets may change to meet the needs of the District at that budget cycle.

The potable water master plan is fundamentally based on the experience of OMWD staff regarding the water treatment and distribution system condition and performance. OMWD staff input led to several CIP projects, and staff, with assistance from consultants, developed the recurring project budgets in the CIP. OMWD also monitors supply and demand needs, as well as regulatory drivers that may result in changes for OMWD. The current master plan includes the development of a hydraulic model of the distribution system, and use of the model to identify any deficiencies, and to evaluate scenarios developed by staff. The potable master plan is also based on a series of assessments of the condition and performance of various infrastructure in the treatment and distribution system, each of which is summarized in the next section.

The recycled water master plan Is also based on OMWD staff input and the use of a hydraulic model to identify hydraulic deficiencies, and evaluate scenarios developed by staff. The recently completed wastewater master plan identified several components at the 4S Ranch Water Reclamation Facility that are integral to the production, storage, and distribution of recycled water. If any of the facilities which are integral to recycled water delivery required repair or replacement, a portion or all of the project cost was assigned to the recycled water capital improvement plan.

Supply Considerations and Regulatory Drivers

OMWD monitors and evaluates demands and supply needs, as well as regulatory drivers that may result in changes for OMWD.

Supply Considerations

2020 Urban Water Management Plan and Demands

The State of California requires that all water agencies submit an Urban Water Management Plan (UWMP) every five years. OMWD's most recent UWMP was submitted on July 1, 2021 (DLM Engineering, Inc., 2021), and it will be updated again for a July 1, 2026 deadline. The UWMP contains a:

- Description of the OMWD system
- Characterization of potable and non-potable water uses
- Description of water use reduction targets and reports on compliance with the targets in 2020
- Characterization of existing and future water supplies
- Description of water service reliability and drought risk assessment, and
- Water shortage contingency plan.

The 2020 UWMP included a water demand forecast that predicted OMWD's demand would decline slightly over time, due to the small remaining amount of developable land, the cost of water, and a trend of landscape turf conversions. The potable and recycled demands presented in the UWMP are shown in Table 2:

Table 2 Total Water Use, Demand Forecast (Potable and Recycled; AFY)

Type	2020	2025	2030	2035	2040
Potable	17,100	17,410	16,960	16,640	16,310
Recycled	2,482	2,693	2,819	2,834	2,855
Total	19,582	20,103	19,779	19,474	19,165

The reader is referred to the UWMP for a detailed description of the forecast as it will not be covered in this master plan document. The UWMP also summarized OMWD's future sources of water including CWA, recycled water for irrigation, and conceptually the San Dieguito Valley Brackish Groundwater Desalination Project. OMWD's CWA supply is considered highly reliable and the groundwater project, if implemented, would further increase reliability. Again, the reader is referred to the UWMP for details as water supply will not be covered in detail in this master plan document. With the exception of the San Dieguito Brackish Groundwater Desalination Project, there are no CIP projects in the 10-year to expand and diversify the potable water supply.

OMWD planned and expanded its recycled water systems to prioritize service to large users such as homeowner's associations, parks, and golf courses, because it is the most cost-effective approach, with the most demand served for the least infrastructure investment. OMWD has identified additional potential recycled water demands and this is the basis of the forecast. OMWD will expand the distribution system to serve these customers, if grant funding and other resources become available to make the projects more cost effective. The Manchester Avenue Recycled Water Project is an example of a recent recycled system expansion receiving grant funding.

Existing and Potential Development in OMWD, Equivalent Dwelling Units (EDUs)

OMWD uses the EDU to track customers in its billing system. A typical single-family dwelling unit is defined as one EDU. Typically, each multi-family unit is less than one EDU, and large estate-type development may be more than one EDU. In September 2023, an EDU forecast for OMWD was completed by Zone of Benefit based upon the latest San Diego Association of Governments (SANDAG) growth forecast (Gillingham Water, 2023). The Zones of Benefits are shown in Figure 10. This EDU forecast, as well as known developments on the 10-year horizon, are utilized in the calculation of capacity fees for new development and were incorporated into the Water Capacity Fee Study (Raftelis, 2023). The forecast estimated the following, with total buildout predicted in Table 3:

- Approximately 50 EDUs/year up to 2030
- Approximately 35 EDUs/year between 2031 and 2040, and
- Approximately 30 EDUs/year between 2041 and 2050

Table 3 Adjusted Counts of Total Potable EDUs in 2050 by Zone of Benefit

Zone of Benefit	Current EDUs	EDU Projections	Build-Out EDUs
Zone A	16,113	359	16,472
Zone B	4,834	515	5,349
Zone C	590	93	683
Zone D	4,838	126	4,964
Zone E	5,374	87	5,461
Total	**31,749**	**1,180**	**32,929**

Regulatory Drivers

The water industry is governed by a number of State and Federal agencies and their regulations. Their regulations are continually being updated, in response to the identification of new constituents of concern, and governmental mandates. These regulatory updates will drive CIP projects, but OMWD generally does not add them to the CIP until they are relatively certain. Some key regulatory drivers that OMWD is monitoring include fleet electrification, PFAS, and conservation.

Fleet Electrification

The California Air Resources Board has adopted advance clean fleets (ACF) regulations which are intended to:

- Deploy medium- and heavy-duty zero-emissions vehicles (ZEV)
- Compliment the Advanced Clean Trucks (ACT) regulation of which ensures acceleration of large-scale fleet transition to ZEV, and
- Help achieve the State's health protective air quality standards and climate goals.

In response to these regulations, OMWD has selected TerraVerde Energy to evaluate OMWD's fleet and develop a plan to meet the regulations. Preliminary budgets have been included in the CIP for potable water, recycled water, and wastewater, to fund the electrification effort.

PFAS

The U.S. Environmental Protection Agency (EPA) and the State Division of Drinking Water (DDW) regulate the constituents in the water supply and set maximum contaminant levels, or MCLs. Recently, EPA has set MCLs for Per- and Polyfluoroalkyl substances, known collectively as PFAS. Monitoring is required by 2027 and compliance is required by 2029. Setting PFAS standards is a priority for DDW. None of these substances are present in the water supplies OMWD purchases from the Metropolitan Water District of Southern California (MWD), nor have they been detected in the treated water OMWD serves to our customers. OMWD will continue its drinking water supply sampling and monitoring to ensure the continued delivery of safe drinking water to customers. At some point in the future, should PFAS be detected in OMWD's water supply, and exceed the MCLs, CIP projects would be required and would be costly. The best available technology to remove PFAS from water is reverse osmosis membranes. Staff will continue to monitor this issue and a more complete description of water quality can be found in OMWD's Consumer Confidence Report, available on its website. The OMWD Board opted out of PFAS class action settlements in 2023 and preserved its rights to sue in the future if it needs to treat for PFAS.

Conservation

OMWD has been promoting water conservation and water use efficiency for many years. MWD and CWA have been incentivizing conservation through rebates for programs like turf removal, smart irrigation controllers, and low-flush toilets. Recently, the State of California has approved a program known as Making Conservation a Way of Life. The program sets specific water use targets for indoor and outdoor water use and will be effective in the next 10 years. This program may further reduce OMWD's water demands in 2040 and beyond and may impact capital projects, and staff will continue to monitor the impacts.

Hydraulic Modeling and Analyses

The current master plan includes the development and calibration of hydraulic models for both the potable (Potable TM No. 1, February 2024, Ardurra) and recycled distribution systems (Recycled TM No. 1, February 2024, Ardurra; Recycled TM No. 3, April 2024, Ardurra). The hydraulic models are used to identify any deficiencies and to evaluate scenarios developed by staff.

Water System Planning Criteria

The current master plan included the review of the OMWD existing planning criteria, and that of industry associations and local districts, for both potable and recycled water. The planning criteria includes:

- Peaking factors
- Minimum and maximum system pressures
- Minimum pipeline sizes and maximum allowable velocities
- Pump station pumps and capacities
- Pressure reducing station valving, and
- System storage volumes

This planning criteria is the basis for identifying deficiencies in the existing distribution systems. It will also be utilized by developers, as they layout and plan facilities to service their developments. The planning criteria for the potable water system is listed in Table 4, included at the end of the document (Potable TM No. 3, August 2024, Ardurra). The planning criteria for recycled water is shown in Table 5, also included at the end (Recycled TM No. 1, Aug. 2024; Recycled TM No. 4, Oct. 2024, Ardurra).

Hydraulic Model Development and Scenario Analyses

For many years, OMWD has retained IEC (now Ardurra), with expertise in the hydraulic modeling of distribution systems, to maintain and operate a hydraulic model for the analyses of new developments, and specific operational scenarios on the potable system. A hydraulic model of the Northwest Quadrant recycled water system was developed for planning the Village Park recycled water system, and other possible improvements. A hydraulic model was not available for the Southeast Quadrant. A hydraulic model was developed as a part of the Manchester Avenue recycled water system planning. In this year's master plan, Ardurra built new models for both the potable and recycled water systems based on the OMWD geographic information system (GIS). Details of the models, including pump station, pressure reducing station, and other settings were coordinated closely with the OMWD Operations Department. Flow and pressure data was collected on specific days, and the models were successfully calibrated to the data.

The potable system was evaluated by Ardurra under maximum day, peak hour, and maximum day plus fire flow scenarios. The fire flow analysis was based on the more recently updated and adopted criteria of the cities and fire districts that cover OMWD, which has changed over time. The criteria were generally consistent with that of Vallecitos Water District and Vista Irrigation District. The system generally met, or was close to meeting the newly adopted fire department planning criteria. While these analyses did not result in specific CIP projects, they did identify areas within OMWD with deficiencies in meeting the newly adopted fire department planning criteria that should be considered in conjunction with other CIP projects, or new developments, in the vicinity.

OMWD's planning criteria is utilized as a "best practice." Velocities are limited to avoid damage to pipelines, fittings, valves, and appurtenances, especially as infrastructure ages. Head loss limitations are intended to avoid significant pressure decreases, and low pressures. Minimum pressure limitations increase the system ability to fight fires, and also provide customers with adequate pressure to deliver flows, operate irrigation systems, water fixtures and appliances, and other equipment. With the information provided by Ardurra and the hydraulic model, OMWD staff now have a reference for the location of the small diameter pipelines, and their impact on the distribution system. This information

will be used to plan future CIP projects, and new development projects, to improve the system capability efficiently. Developers may be required to upsize pipelines.

For the potable system, specific scenarios involving the replacement of the Palms Tanks with Pressure Reducing Stations (PRS) and the feasibility of a groundwater pump station for the San Dieguito Groundwater Project were evaluated utilizing the model (Potable TM No. 3, August 2024, Ardurra). Replacement of the Palms Tanks with PRS is feasible and the modeling provided PRS locations for design. The groundwater pump station was also feasible, with additional investigations needed, if the San Dieguito Project moves forward.

The recycled system was evaluated under maximum day and peak hour scenarios. The systems generally met the planning criteria, and no capital projects were recommended (Recycled TM No. 2, August 2024, Ardurra), (Recycled TM No. 4, October 2024, Ardurra).

For the Northwest Quadrant recycled system, the model was used to evaluate increasing the water supply from SEJPA, through the use of the Wanket Tank and a connecting pipeline. The analysis concluded that with several facility improvements, the concept could meet the planning criteria. This concept was considered feasible, subject to some additional investigations, after confirming sources of supply and future demands. However, no improvements for this scenario were incorporated in the current CIP, and the option can be further evaluated in the future if needed. In the Southeast Quadrant, the model was used to evaluate theoretical increased demands in the San Dieguito Valley. This analysis provided valuable system capability information, should demands increase, but no additions to the CIP were made.

Infrastructure Planning, Condition Assessments, and Needs by System

The potable and recycled master plan is also based on a series of assessments of the condition and performance of various infrastructure in the treatment and distribution systems, which prioritizes projects based on risk, reviewing the likelihood of an event and the potential consequence of that event. Those planning efforts and condition assessments, as well as other needs identified, are summarized by system in the following section. The 10-year CIP for each system is presented in Tables 7 -16 at the end.

Planning and Water Supply

As described in Supply Considerations, there are no CIP projects in the 10-year to expand and diversify the potable water suppl, with the exception of the San Dieguito Brackish Groundwater Desalination Project. As noted in Methodology, the Potable and Recycled Water Master Plan should be updated approximately every 5-6 years and an update is projected in the 10-year CIP. Planning and supply projects are listed in Table 7.

Site Improvements

Site improvement projects are listed in Table 8 and include parking and access improvement projects, the Elfin Forest Recreational Reserve parking lot expansion, and site asphalt rehabilitation and replacement at facilities throughout OMWD including at Headquarters, pump stations, and tanks.

E&I/Technology System Needs

Electrical and Instrumentation (E&I) and technology needs were identified and proposed projects are listed in Table 9 and include:

- Advanced Metering Infrastructure (AMI) – These replace existing customer meters with meters that can be read remotely.
- CIS Infinity System Upgrade – This includes upgrades to OMWD's customer information and billing systems to bring the software to the latest version.
- District Wide SCADA Upgrades – SCADA stands for supervisory control and data acquisition equipment which can be used to control facilities like pump stations remotely. The equipment also archives data such as pressure and flow at various points throughout OMWD. The software needs to be upgraded to the latest version.
- District Wide PLC Replacements – PLCs are programmable logic controllers or industrial computers for the control of water system equipment such as water treatment processes and pump stations. Many PLCs have reached the end of their useful life and need to be replaced.
- District Wide Physical Security Improvements – Projects include fencing, gates and locks to address security needs.
- Fleet Electrification Projects – as described as a regulatory driver, the State of California Air Resources Board (CARB) has mandated that utilities like OMWD to comply with their Zero-Emission Vehicle (ZEV) requirements. The projects could involve the replacement of gas- and diesel-powered vehicles with zero-emission vehicles. The projects may also include charging or other support facilities.

Distribution System – Pipelines

As noted in the hydraulic modeling section, the distribution system generally met the planning criteria and no specific CIP projects were identified through that effort. OMWD has conducted planning efforts focused on infrastructure management that have recommended improvements, shown in Table 10.

Budgeting for Long-Term Pipeline Replacement

OMWD retained HDR, Inc., who has specialized experience in pipeline asset management, to provide guidance on long-term pipeline replacement budget planning (HDR, 2024). The consultant collected and analyzed OMWD's history of pipeline leaks and breaks, and compared it to more than 20 local and national water agencies. They also reviewed guidance provided by national industry associations. HDR considered three different approaches to establish budgets for pipeline replacements: age-based, OMWD's historical investment levels, and an approach based on the performance of OMWD's pipelines. Overall, they concluded that OMWD had a relatively low rate of pipeline leaks and breaks, and, compared to other agencies, has been budgeting sufficiently to maintain the system. They recommended the performance-based approach for a 50-year pipeline replacement budget forecast at a balanced level. There are two large pipeline replacement projects in the 10-year CIP shown in Table 10, at the end. However, the consultant noted that as the pipelines continue to age, OMWD will have to significantly increase the CIP budget for replacement.

Potable Pipeline Condition Assessment Program

The OMWD potable pipeline condition assessment program was initiated with a pipeline risk prioritization study, prepared by Pure Technologies, that identified 30 pipelines of interest, 11 of which were steel pipelines (Pure, 2017). OMWD then selected PICA, and Pure Technologies to conduct electromagnetic or CCTV inspection of four pipelines including:

- Unit A 12-Inch Pipelines in Rancho Santa Fe Road and Encinitas Boulevard in 2020
- Unit B 24-Inch Pipeline in 2019
- Unit K 27-Inch Pipeline in 2019

The prioritization also recommended assessment procedures for asbestos-cement and polyvinyl chloride (PVC) pipe. OMWD retained HDR, Inc., with specialized experience in pipeline internal inspections and evaluating the results, to plan repair and rehabilitation projects, and lay out the next phase of inspections (HDR, 2020, 2023). Because of its poor condition, the northerly portion of the Unit A Pipeline in Rancho Santa Fe Road has been scheduled for replacement in FY 2025. Staff also identified a stretch of pipe along Dusty Trail to be replaced based on an analysis of recent leaks. Three other inspection and rehabilitation projects have been incorporated into the OMWD 10-Year CIP and are summarized in Table 10.

Distribution System – Tanks and Pressure Management

As noted in the hydraulic modeling section, the distribution system generally met the planning criteria and no specific CIP projects were identified through that effort. OMWD has conducted planning efforts focused on infrastructure management that have recommended improvements.

Program to Maintain Potable and Recycled Water Steel Storage Tanks

OMWD has contracted with Utility Services Company to maintain all of its steel water storage tanks in the distribution system in "like new" condition. The cost of this service is shown in the OMWD annual budget as an operating expense. As a result of this approach, there are no CIP projects for the steel water storage tanks in the distribution system.

Condition Assessments for Potable and Recycled Water Concrete Storage Tanks

In 2021 and 2022, OMWD selected two consultants, Peterson Structural Engineers, and Richard Brady and Associates, with prestressed concrete tank design and assessment experience, to assess the condition of its concrete water storage tanks. The assessment reports (Brady, 2021) (PSE, 2022) identified improvements required in the short term, and recommendations for on-going inspection and assessments. From the reports, a CIP project was developed to address high priority safety improvements at the Gano, Gaty II, and Santa Fe Valley Tanks. The design is in progress and construction is scheduled for FY 2025. On going inspections and lower priority improvements are also scheduled for later in the 10-year CIP, as shown in Table 11, except for the Santa Fe Valley Tank, which is shown in Table 15, because it is for the storage of recycled water.

Pressure Reducing Station (PRS) Replacement Prioritization

Staff from the OMWD Operations Department visit the pressure reducing stations on a regular basis and complete a visual inspection of their condition. Based on this experience and consequences of failure, staff prioritized the replacement of the PRS' in the 10-year CIP, starting with Village Park and Gardendale, which are scheduled to be replaced in FY 2025. Balboa Engineering completed the design of the first two replacements. Del Lago, Southeast #1, Quail Gardens, and Via Valle Verde are scheduled for replacement later in the next 10 -years, as shown in Table 12. Additional replacements are tentatively scheduled in years 11 through 20 and can be re-prioritized. OMWD's existing PRS locations are shown in Figure 1.

DCMWTP Planning Efforts and System Needs

DCMWTP Condition Assessment

In 2023, OMWD selected Carollo Engineers for this work on the DCMWTP (Carollo, 2024). They have specialized expertise in the condition assessment and operation of water treatment plant facilities. Carollo performed a condition assessment of the DCMWTP, which was originally put in operation in 2003, with a scope of work that included:

- Extensive interviews and coordination with OMWD staff
- Review of Plant records
- Physical inspection of Plant facilities
- Concrete testing for the membrane basins
- Various testing of metallic components
- CCTV inspections of pipelines
- Corrosion testing
- Structural analysis

The condition assessment reviewed 2,000 assets and found that less than one percent had a severe risk of failure. The assessment identified $17.3 million dollars in projects over the next ten years, $5.3 million of which are considered high-priority. The projects have been incorporated into the OMWD 10-Year CIP and are summarized at the end in Table 13.

DCMWTP Capacity Reliability Study

In 2017, Hazen and Sawyer was selected to perform a capacity reliability study of the DCMWTP (Hazen, 2018), investigating five specific areas:

- Recovery of backwash waste water from the influent strainers to reduce waste streams
- Addition of one ultrafiltration membrane treatment train to stage 2 of the treatment process to improve reliability and flexibility
- Addition of dissolved air flotation to stage 3 to remove solids
- Addition of a centrifuge to stage 4 to provide reliability, and
- Evaluation of disinfection alternatives and disinfectant by product control.

Staff carefully considered the recommendations in Hazen's 2018 study report and prioritized them. The plant currently has just one centrifuge for dewatering the second stage membrane reject water, and if it is offline for more than one to two days, either an alternative disposal method must be used for the reject water, or the plant must be shut down. Staff recognized this as the most critical project for reliability, completed the design of a second centrifuge, and a construction contract has been awarded. Other improvements in the study report have been prioritized beyond the 10-year CIP. The DCMWTP disinfection system is performing well and meeting all regulations. The evaluation of alternatives was intended to address changing source water quality, or changing regulations. Because these improvements are not currently needed, the other recommended projects have not been scheduled in the 10-year CIP.

Recycled System

Wastewater Master Plan Update – Recycled Water Projects

The recently completed Wastewater Master Plan Update (Dudek, 2024) assessed the condition of the 4S Ranch Water Reclamation Facility (WRF) and required improvements. The WRF not only treats the wastewater to secondary standards, but also treats it to tertiary standards, producing recycled water for irrigation. The Wastewater Master Plan identified improvements that were required to individual facilities that provide both wastewater treatment and recycled water production. These costs were divided between the potable water and recycled water CIPs. The recycled improvements are listed in Table 15.

Potential Recycled Water Extension Projects to Consider in the Future

OMWD's backbone recycled water distribution system was planned and constructed to serve customers with the largest demands and with logical sources of supply. With this approach, the maximum amount of water is delivered for the lowest cost.

As OMWD expands its recycled water distribution systems, it takes the same approach. OMWD staff have identified irrigation customers not located along existing recycled water pipelines. Staff has estimated the customer demands and has organized them into logical pipeline extension projects. Those extension projects with the greatest demand per unit of investment are given the higher priorities. Three of the most potentially viable projects, the Garden View Road Recycled Extension, the Willowspring South Drive Recycled Extension, and the Four Gee Road Recycled Extension, are summarized in Table 6 and shown in the maps in Figures 11, 12, and 13, respectively. The Garden View Road Recycled Extension is in the Northwest Quadrant (Quail Gardens Zone) and would be served by the SEJPA Leucadia Blvd connection. The Willowspring South Drive Recycled Extension is in the Northwest Quadrant (Village Park Zone) and would be served by the SEJPA via the Wiegand Tank. The Four Gee Road Recycled Extension is in the Southeast Quadrant and would be served by the 4S WRF and other existing sources.

These projects are not currently in the CIP, but could be added if funding and staff resources are available. As documented in the Long-Term Budgeting for Pipeline Replacement Report (HDR, January 2024), OMWD's recent pipeline installation costs are approximately $73/inch diameter-LF, plus another 30 percent of soft costs, for a total project cost of approximately $95/inch diameter-LF. These unit prices would provide a planning level cost, and additional alignment studies and preliminary designs could be conducted to better define the projects and their costs. In addition to these more viable projects, OMWD staff also monitors a list of other potential customers that could be considered for further recycled system expansion.

Table 6 – Potential Recycled Water Extensions

Name of Potential Recycled Water Extension	System	Location/Road	Approximate Pipe Length (ft)	Approximate Demand (AF/Y)
Garden View Road	NWQ (Quail Gardens Zone)	Via Cantebria, Garden View, El Camino Real	2,300	47
Willowspring South Drive Extension (aka VP Townhome Corp No 3, Phase 2)	NWQ (Village Park Zone)	Willowspring South Drive	940	12
Four Gee	SEQ	Four Gee Road	1,670	16

NWQ = Northwest Quadrant SEQ = Southeast Quadrant

Annually Recurring Projects

While much of the OMWD CIP relates to specific facility projects, both the potable and recycled water CIPs also include annually recurring projects. These projects address facilities that are likely to need repair or replacement on an annual basis and their budgets are established by considering historical replacement frequency and expenditures, and the condition and age of facilities. Recurring projects include repair or replacement of network security, pumps, motors, meters, short reaches of pipelines, shut off valves and pressure reducing valves, cathodic protection systems, and minor rehabilitation of concrete tanks.

For the DCMWTP, the projects include mechanical and electronic equipment to measure, monitor, and control the Plant and its processes. The information provided by the electronic equipment is vital for making operational adjustments. This equipment also supports regulatory purposes, sampling the effluent water quality and constituents, and compliance with permit conditions. Generally, it is less expensive to replace this equipment, than to repair it. The projects/ equipment include:

- Membrane replacement
- Membrane train control wiring replacement
- Strainer elements/housing
- Hoists/drive systems
- Actuators
- Chemical tanks
- Chemical mixing and feed systems
- Samplers and water quality and other analyzers
- Pressure and indicators
- Level sensors/transmitters/float switches
- Flow meters
- Various gauges

Based on the current DCMWTP condition, the operations staff have identified the following efforts that are likely to need to be completed in the next four years:

1. Replace two free chlorine analyzers, one total chlorine analyzer, and one fluoride analyzer at the Ammonia Feed Injection Facility.
2. Refurbishment of the housings for the three raw water strainers, which have corrosion damage. This is intended to make the housings usable until their planned replacement in 2033.
3. Replace three pH analyzers on the raw water inlet, finish water effluent, and chemical cleaning system.
4. Replace an unknown number of flow meters that will be identified in the calibration planned for this fiscal year.
5. Replace the polyblend chemical mixing system on the solids handling system.

The annually recurring projects for the potable system are listed in Table 14.

The projects for the recycled water system are similar to potable but also include the conversion of potable meters to recycled. At the 4S Ranch Water Reclamation Facility, the projects included physical security upgrades, Plant A rehabilitation projects, miscellaneous equipment replacement, and mechanical and yard piping replacement. The annually recurring projects for the recycled projects are listed in Table 16.

10-Year Capital Improvement Program Projects for Potable Water and Recycled Water

With these initiatives, a 10-year CIP was prioritized for potable and recycled systems based on risk due to likelihood of failure or consequence of failure. The CIP projects developed in the master plan and infrastructure assessments are listed in Tables 7 through 16, by system type, for both potable and recycled water, showing the years in which the expenditures are planned.

The larger projects scheduled for FY 2025 and FY 2026 include:

- DCMWTP 4th Stage Centrifuge Addition
- DCMWTP 2nd Stage Basin Rehabilitation and Beam Replacement
- Rancho Santa Fe Road North Unit A Pipeline Replacement
- PLC Replacements and AMI
- Gardendale and Village Park Pressure Reducing Station Replacements
- Unit B & K Pipeline Rehabilitation
- Palms Tank Replacement
- Calle Barcelona, Village Park, and Summerhill HOA Recycled Water Pipeline Extensions

These larger projects result in most of the CIP cost. There are however many other smaller projects that round out the CIP including:

- Smaller pipeline and facility projects
- SCADA upgrades
- Security improvements
- Smaller projects at DCMWTP
- Planning projects
- Recurring pump, motor, meter, pipeline, valve, tank, and cathodic protection projects
- Smaller projects at the 4S Ranch WRF for recycled water production

These efforts are the basis for the 10-year CIP budget which supports rate studies. The master plan also serves as a guide for OMWD's reference when revisiting the CIP budget in future years. With time, priorities and budgets may need to be modified to meet the immediate needs of OMWD, and these proposed projects and budgets can be re-assessed and re-prioritized.

List of References (in order of reference)

1. OMWD Water Master Plan, January 2000, Boyle Engineering Corporation.
2. OMWD Comprehensive Master Plan, February 2006, CH2MHill.
3. OMWD Update of Potable and Recycled Water Master Plan Capital Improvement Program, March 2011, AECOM.
4. OMWD Potable Water and Recycled Water Master Plan, April 2016, DLM Engineering, Inc.
5. OMWD 2020 Urban Water Management Plan, June 2021, DLM Engineering, Inc.
6. OMWD Revised Draft EDU Forecast Documentation, September 2023, Gillingham Water Planning and Engineering, Inc.
7. OMWD Water Capacity Fee Study, Raftelis, June 2023
8. OMWD Potable Water System Master Plan Support Executive Summary, October 2024, Ardurra; including:
    - Potable Technical Memorandum No. 1, Potable Water Hydraulic Model Development, February 2024, Ardurra.
    - Potable Technical Memorandum No. 2, Demand Analysis & Model Calibration, March 2024, Ardurra.
    - Potable Technical Memorandum No. 3, Hydraulic Evaluation and Development of Capital Improvement Program, September 2024, Ardurra.
9. OMWD Recycled Water System Master Plan Support Executive Summary, October 2024, Ardurra, including:
    - Recycled Technical Memorandum No. 1, Hydraulic Model Development & Calibration, Northwest Quadrant System, February 2024, Ardurra
    - Recycled Technical Memorandum No. 2, Hydraulic Analysis & System Improvements Northwest Quadrant System; Mahr and Quail Gardens Zones, August 2024, Ardurra
    - Recycled Technical Memorandum No. 3, Hydraulic Model Development and Calibration, Southeast Quadrant System, April 2024, Ardurra
    - Recycled Technical Memorandum No. 4, Hydraulic Analysis & System Improvements, Southeast Quadrant System, October 2024, Ardurra
10. OMWD DCMWTP Condition Assessment, May 2024, Carollo Engineers.
11. OMWD DCMWTP Capacity Reliability Study, Final report – Revision 1, January 24, 2018, Hazen.
12. OMWD Long-Term Budgeting for Pipeline Replacement, January 5, 2024, HDR.
13. OMWD Water Main Risk Prioritization, April 2017, Pure Technologies U.S., Inc.
14. OMWD 24-Inch Unit B and 27-Inch Unit K Pipeline Inspection and Condition Assessment Report, HDR, March 26, 2020.
15. OMWD 12-Inch Rancho Santa Fe Pipeline Inspection and Condition Assessment Report, HDR, July 13, 2020.
16. OMWD 12-Inch Unit A Encinitas Blvd. Pipeline Inspection and Condition Assessment Report, HDR, May 2, 2023
17. OMWD Structural Condition Assessment Report, Gaty II Reservoir, January 2021, Brady.
18. OMWD 2.5 MG Berk Reservoir Evaluation, October 28, 2022, Peterson Structural Engineers.
19. OMWD 6.5 MG Gano Reservoir Evaluation, October 28, 2022, Peterson Structural Engineers.
20. 3.0 MG Santa Fe Valley Reservoir Evaluation, December 2022, Peterson Structural Engineers.
21. OMWD 3.0 MG Wanket Reservoir Evaluation, October 28, 2022, Peterson Structural Engineers.
22. OMWD Wastewater Master Plan Update, June 2024, Dudek.

Figure 1 Existing Potable System [REDACTED FOR PUBLIC USE]

Figure 2 Potable Water Hydraulic Schematic

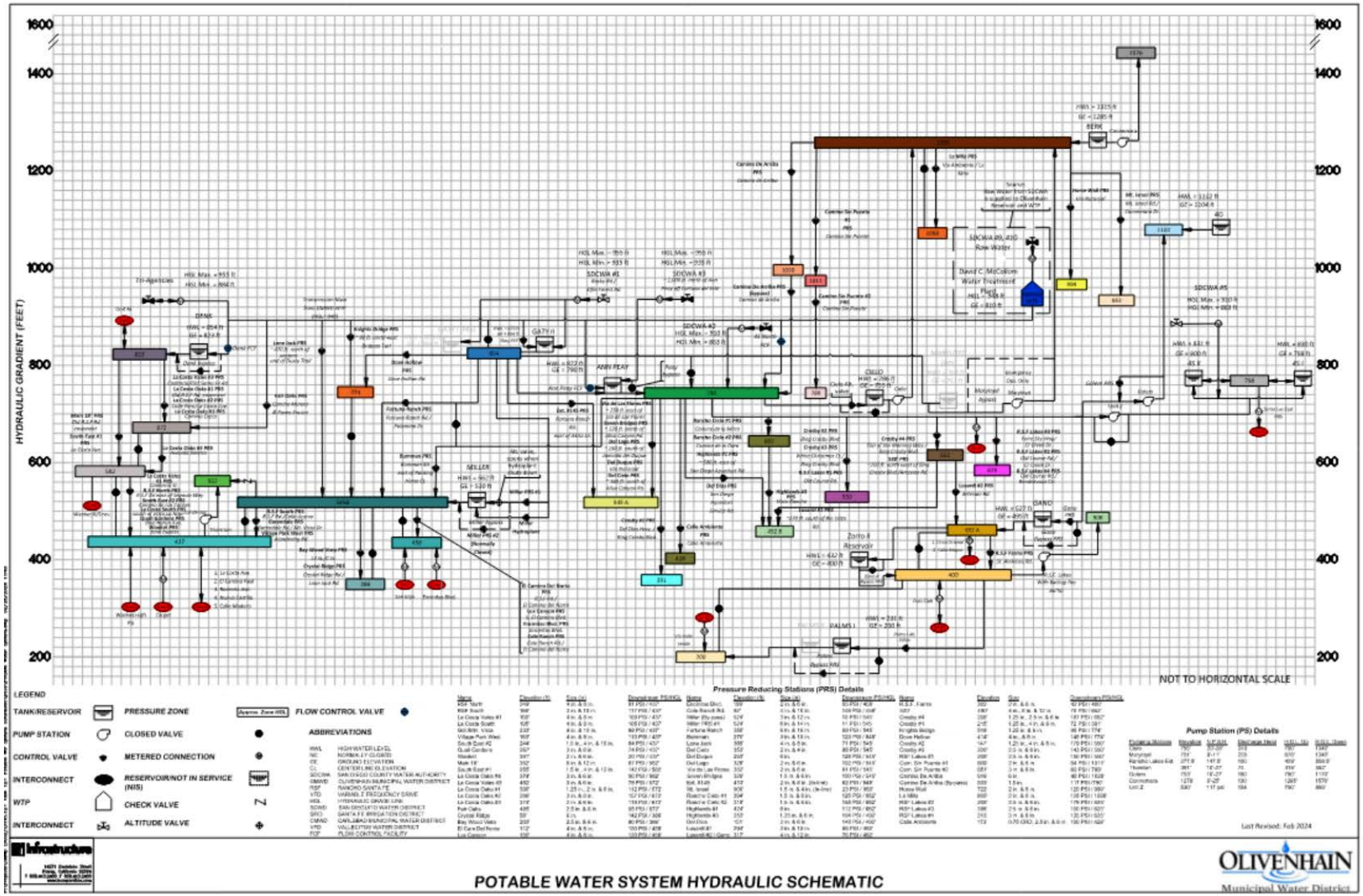

Figure 3 Existing Recycled System

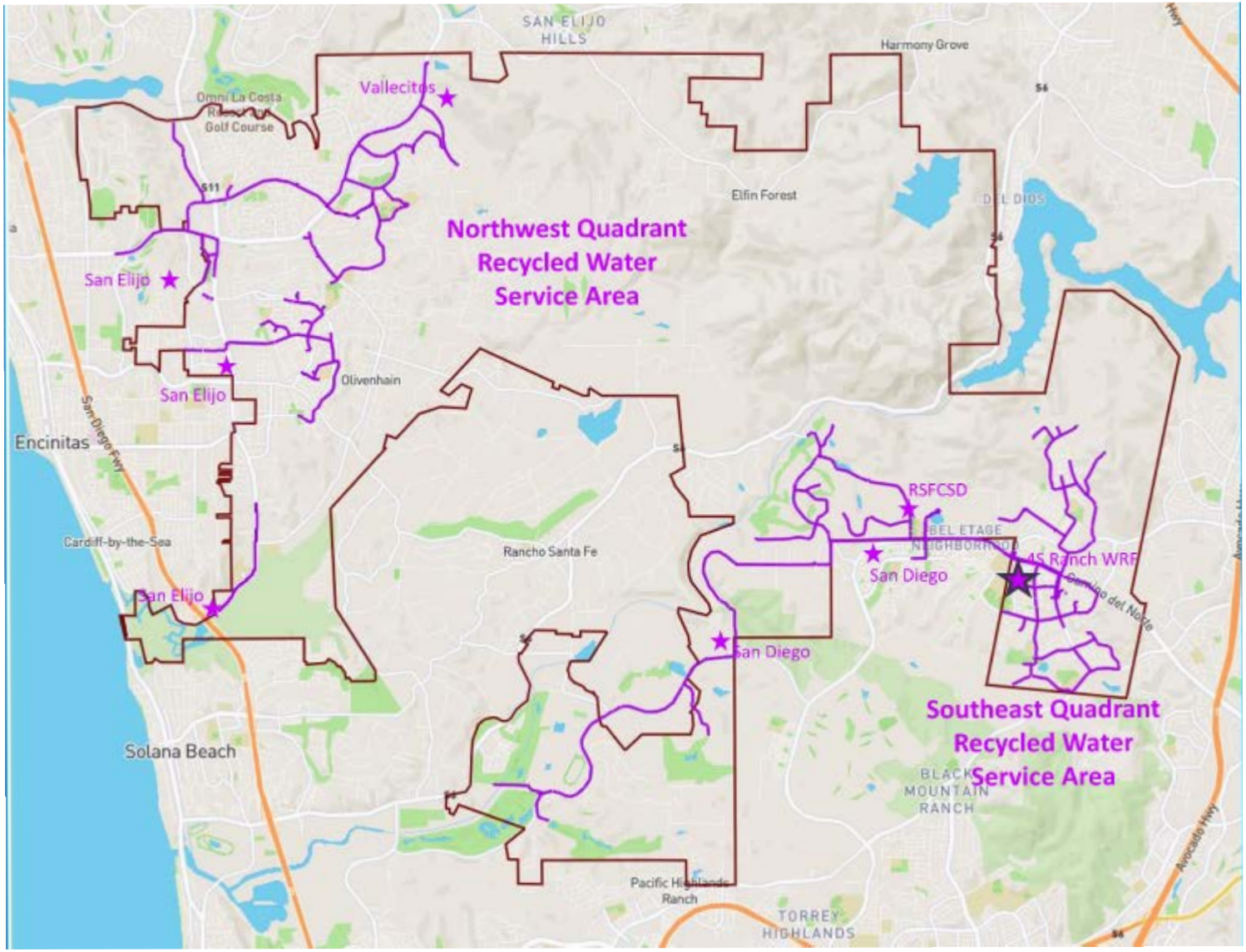

Figure 4 Existing Recycled System – Northwest Quadrant (Mahr Zone, Quail Gardens Zone, and Village Park Zone)

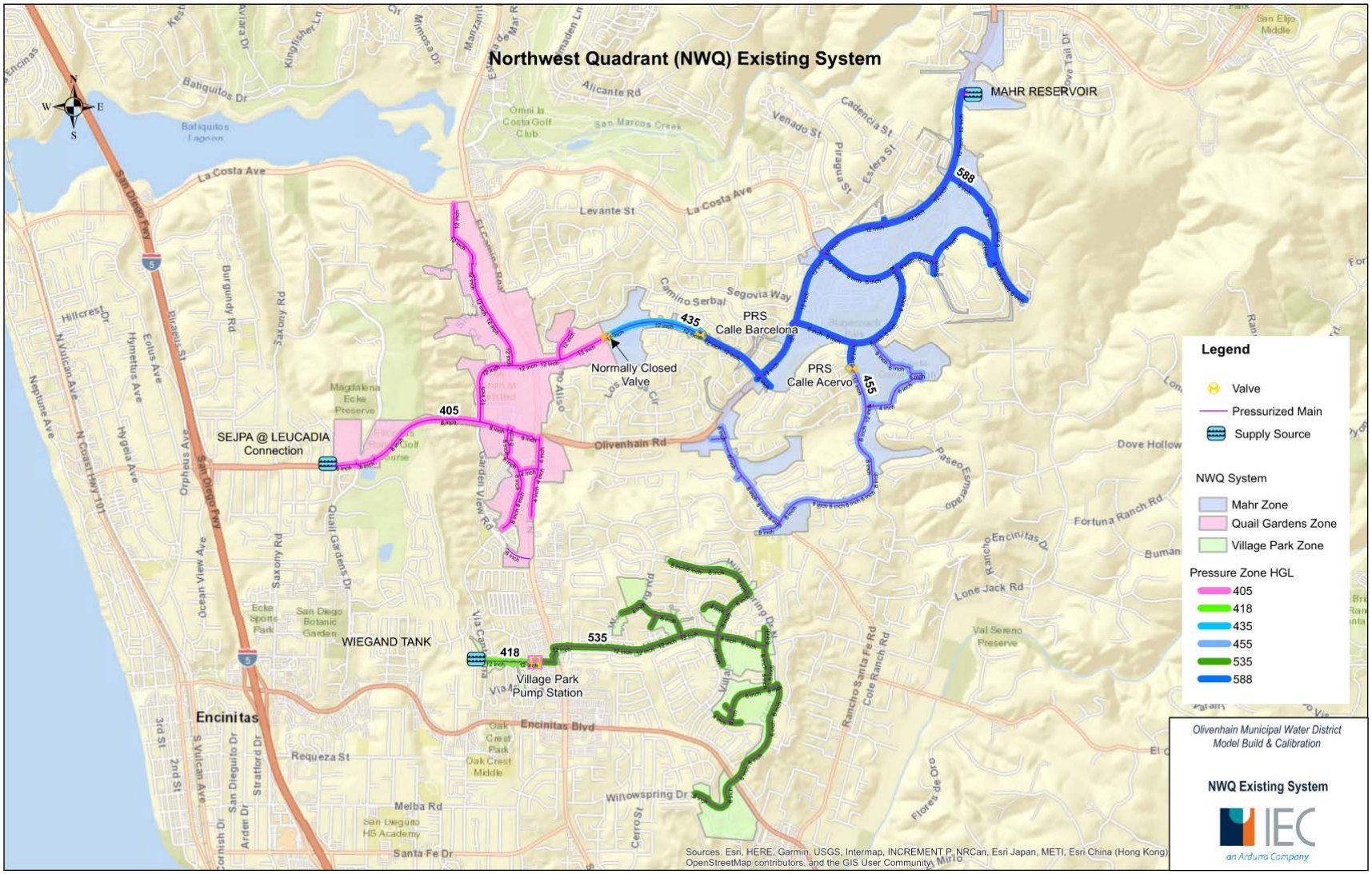

Figure 5 Existing Recycled System – Northwest Quadrant (Manchester Zone)

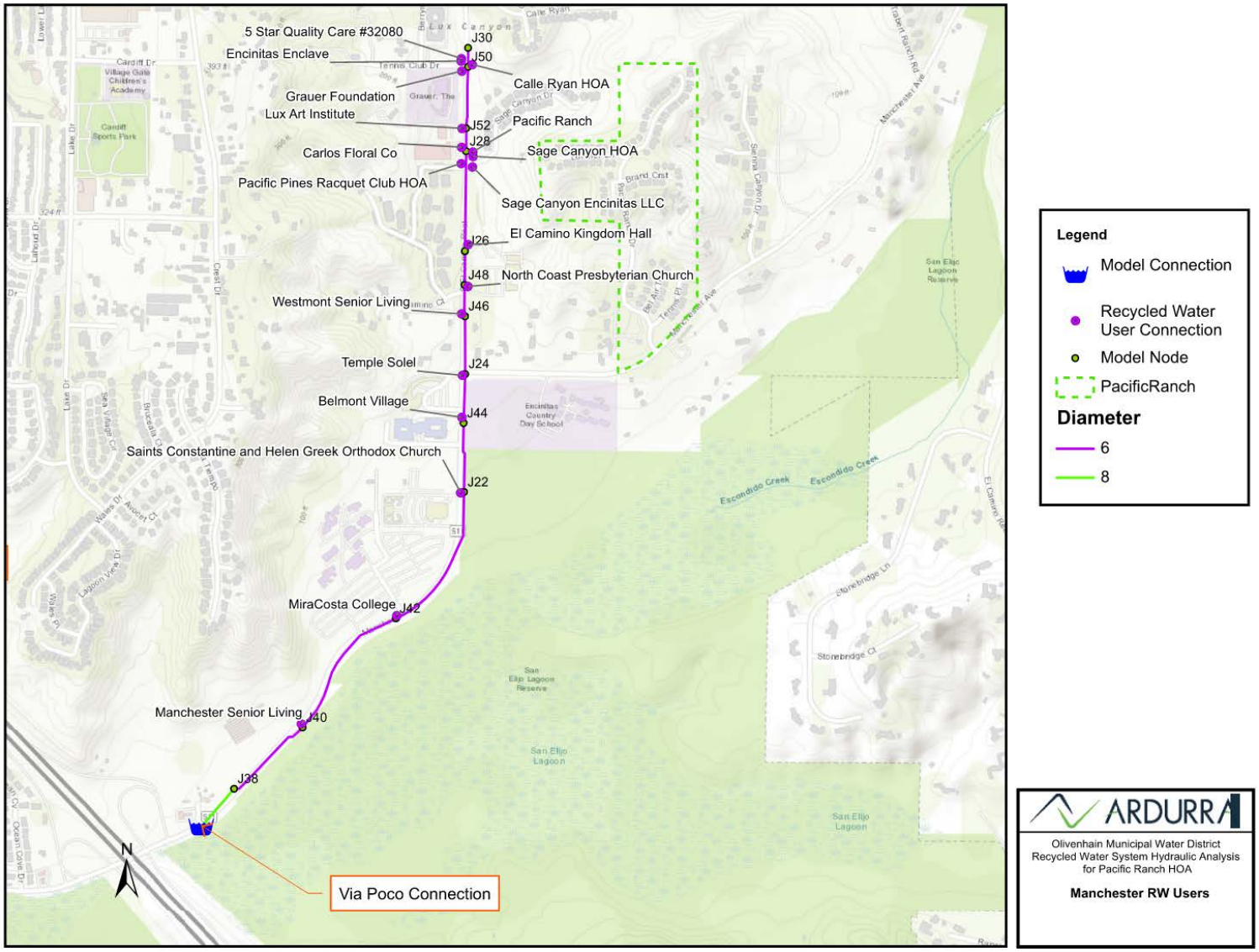

Figure 6 Existing Recycled System – Southeast Quadrant

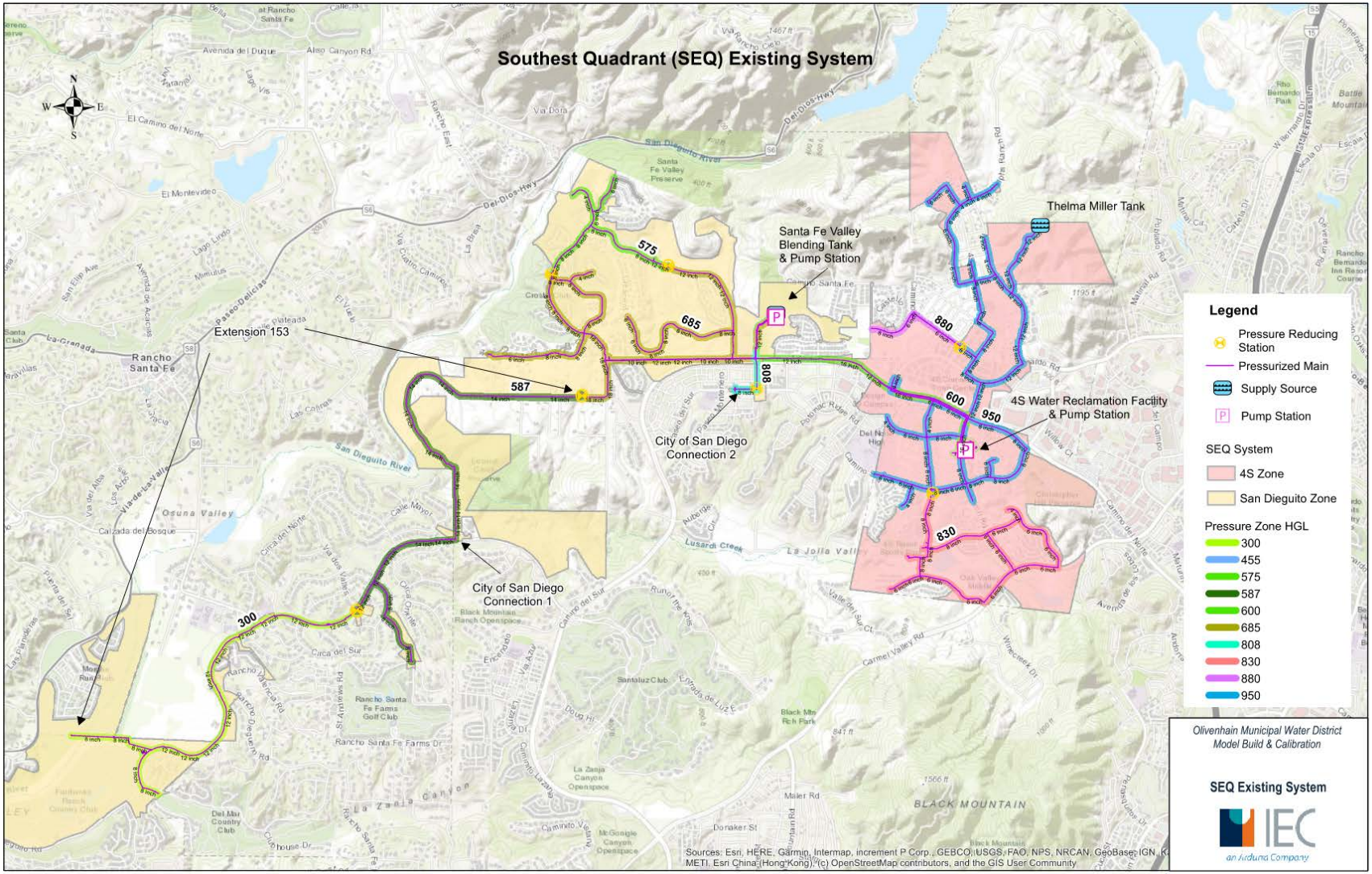

Figure 7 Hydraulic Schematic for Northwest Quadrant (Mahr and Quail Gardens Zones)

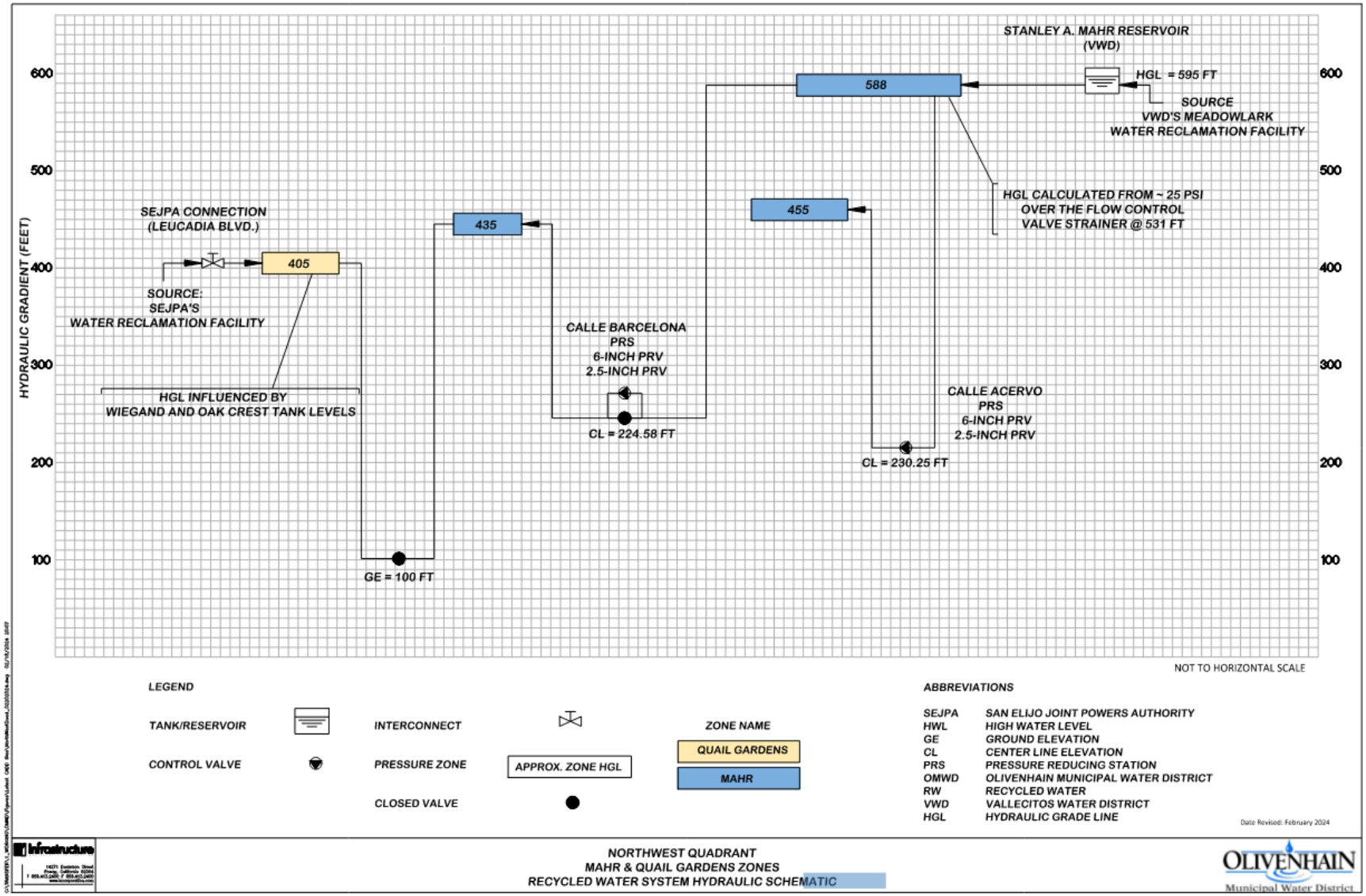

Figure 8 Hydraulic Schematic for Northwest Quadrant (Village Park Zone)

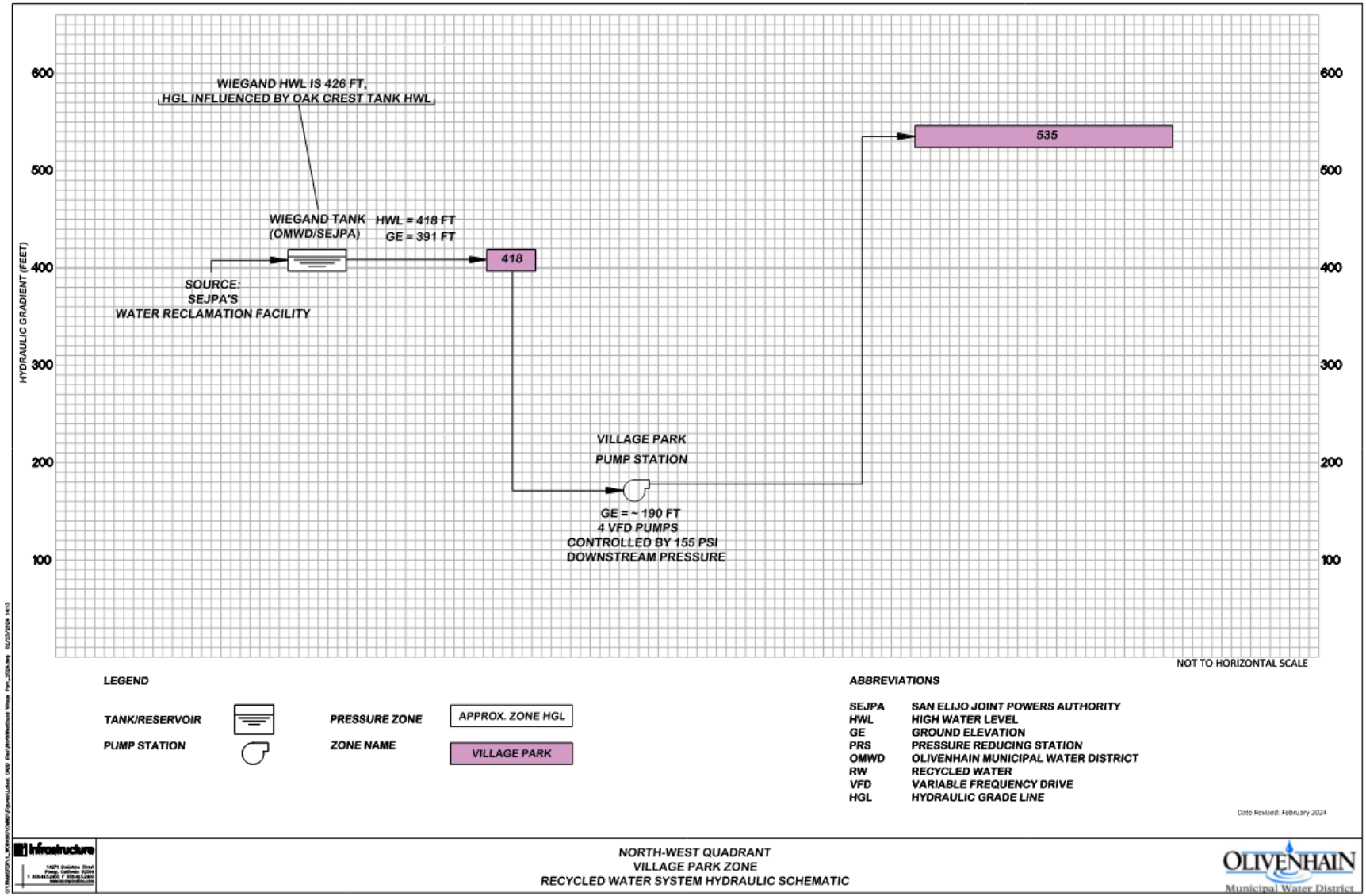

Figure 9 Hydraulic Schematic for Southeast Quadrant

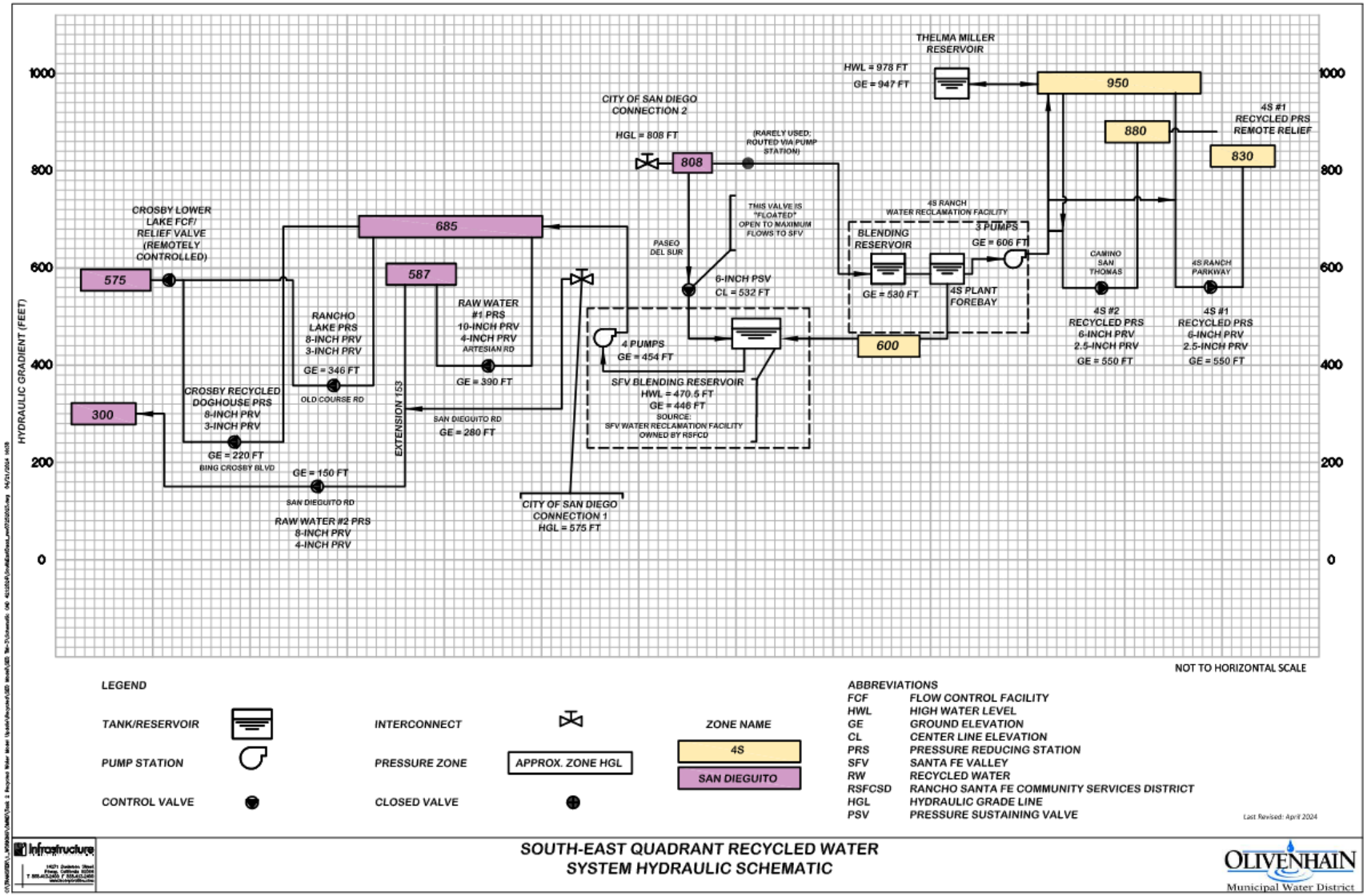

Figure 10 Zones of Benefit

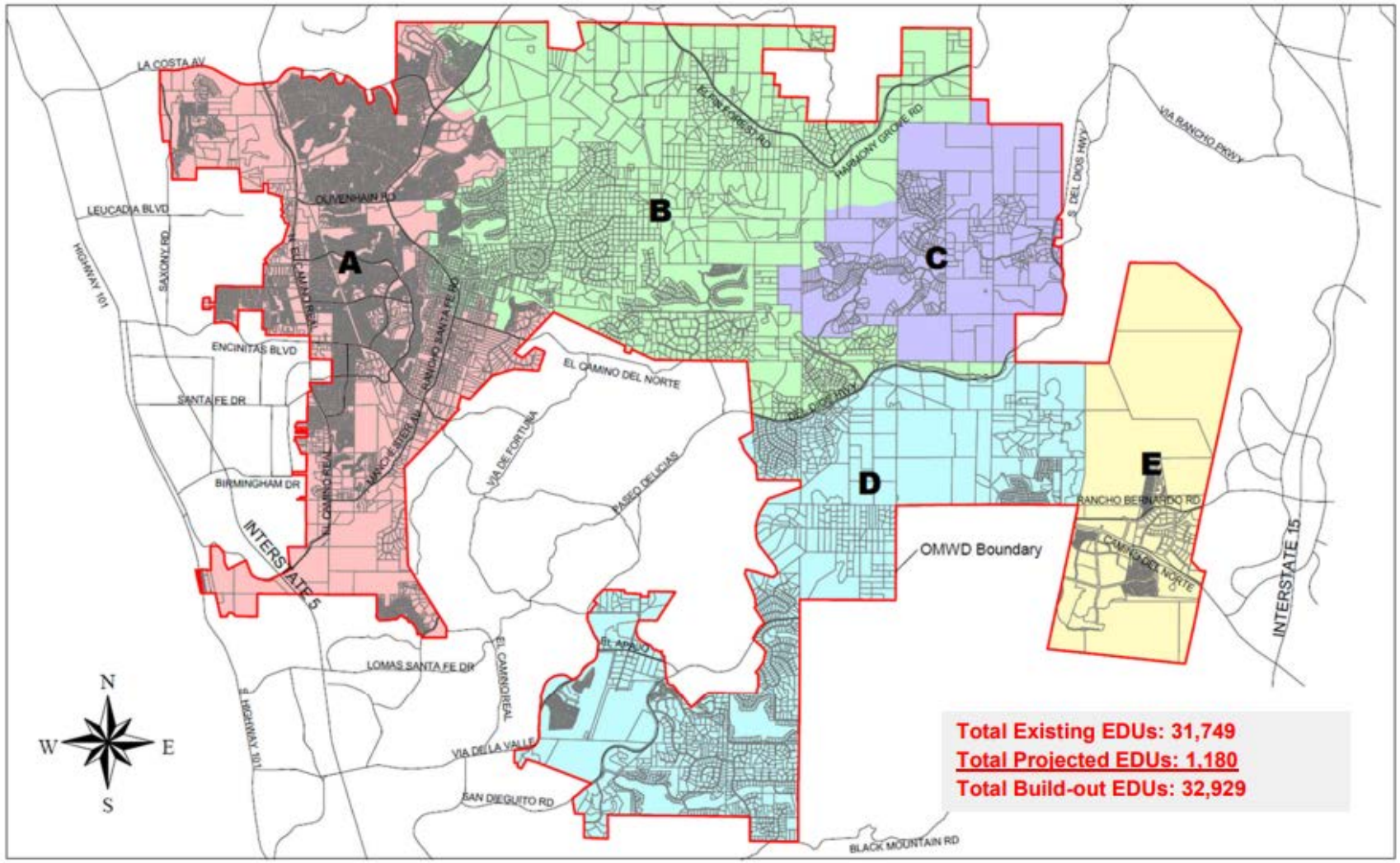

Figure 11 Potential Garden View Road Recycled Extension in the Northwest Quadrant (Quail Gardens Zone)

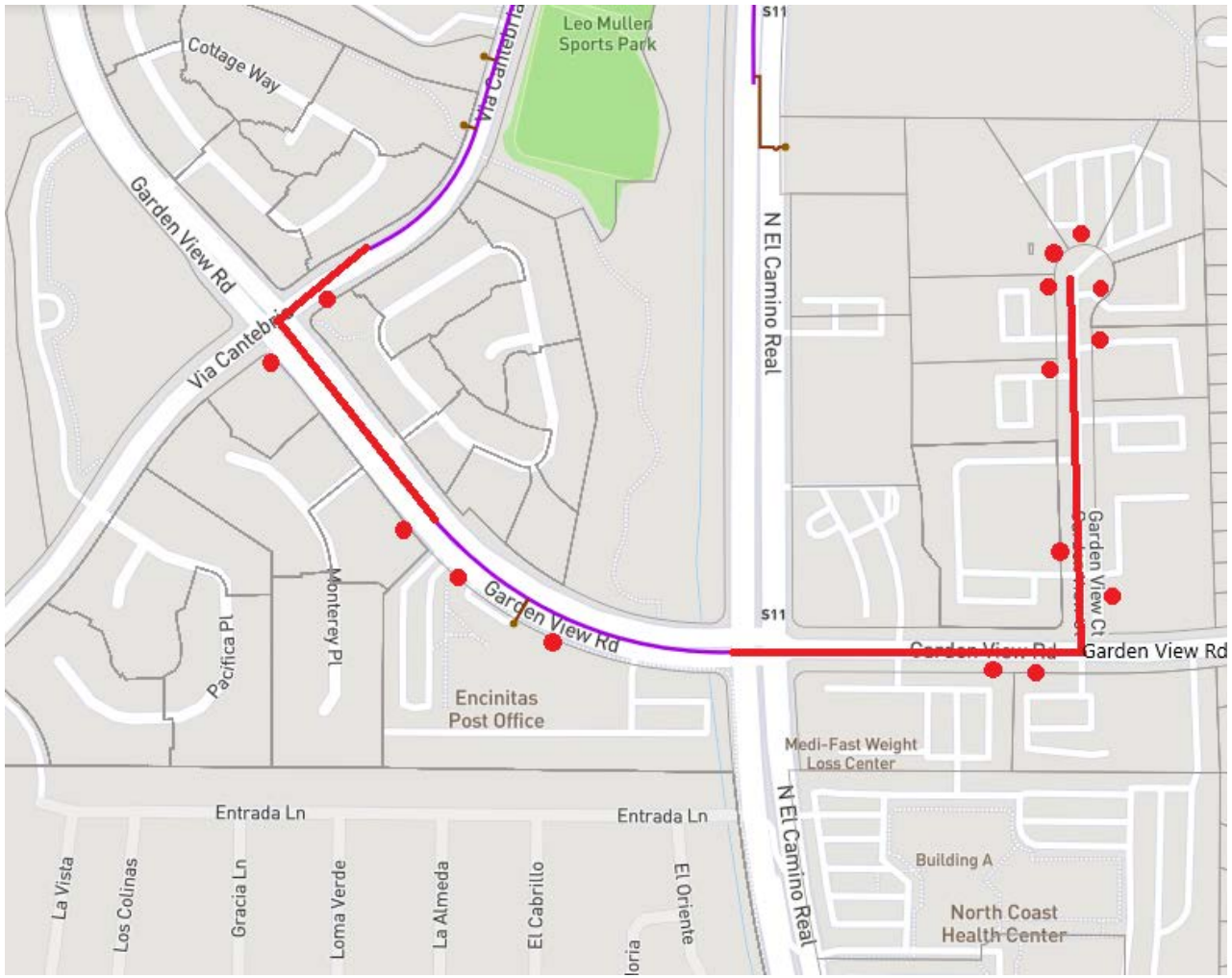

Figure 12 Potential Willowspring South Drive Recycled Extension in the Northwest Quadrant (Village Park Zone)

Figure 13 Potential Four Gee Road Recycled Extension in the Southeast Quadrant

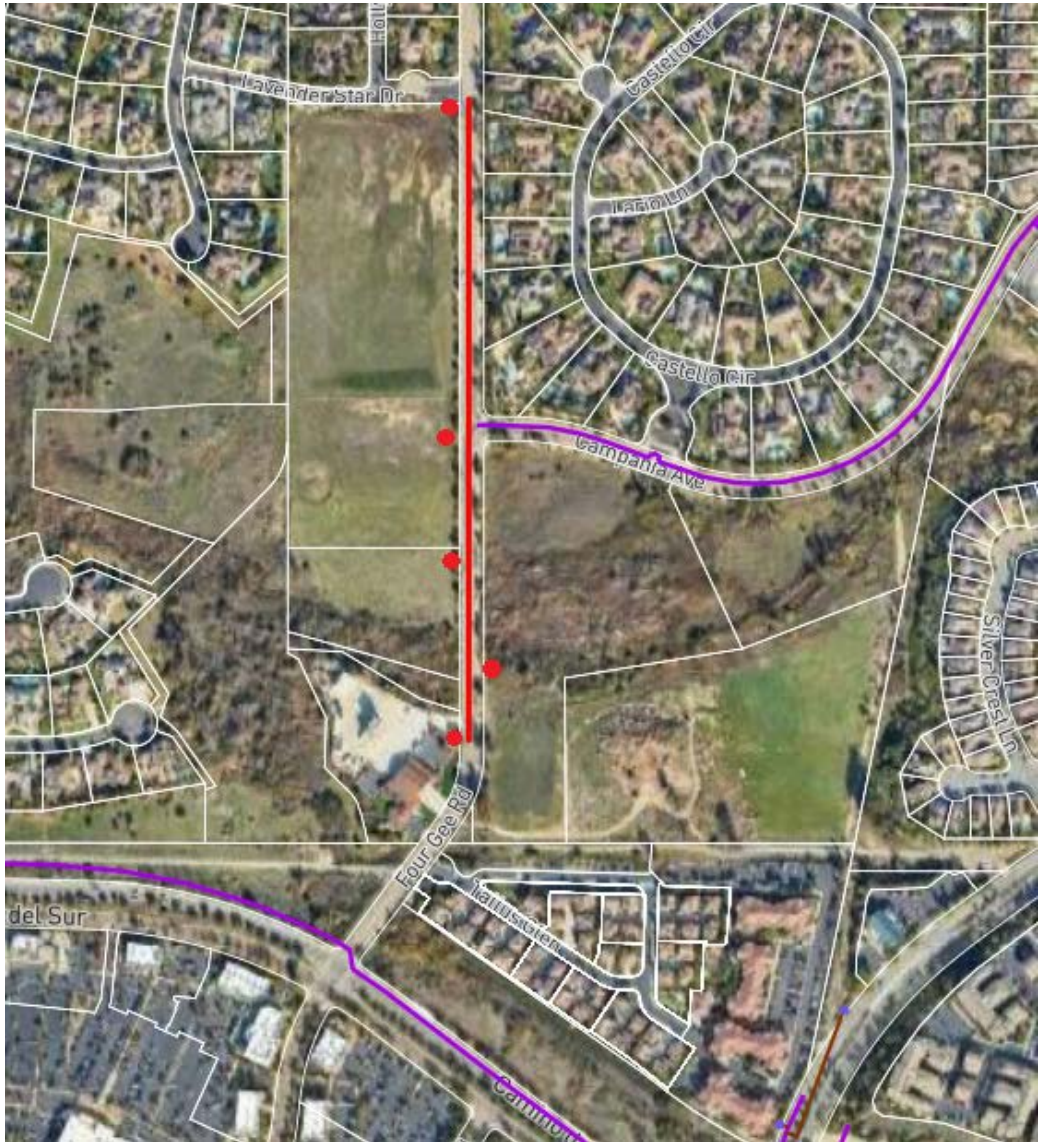

Table 4 Potable System Planning Criteria

Table 1. Distribution System Criteria Comparison and Recommendation

Facility	Criteria	Vallecitos Water District (2018 Water Master Plan)	San Dieguito Water District (2021 Water Master Plan)	Carlsbad Municipal Water District (2019 Water Master Plan)	AWWA Manual M32: Computer Modeling of Water Distribution Systems	Water Agencies Standards	OMWD (Current Standards)[1]	Recommended for OMWD 2024 Water Master Plan
System Pressures	Maximum Desired Pressure (psi)	65	120	125	90	80; 150 (with house regulator)	120	120
	Maximum Allowable Pressure (psi)	150	150	150	110	200	150	150
	Minimum Pressure at Peak Hour Demand (psi)	40	40	40	40-50	40	40	40
	Minimum Pressure at Hydrant Node with Max Day Demands plus Fire Flow (psi)	20	20	20 (with reservoirs half full)[2]	20	20	20	20 (with reservoirs half full)
Pipelines	Minimum Pipe Size for New Construction with Fire Hydrant (in.)	8	8	8	-	-	8	8
	Maximum Allowable Velocity at Peak Flow (fps)	7	7	8	> 4-6	8	7	7
	Maximum Allowable Velocity with Max Day Demands plus Fire Flow (fps)	7	15	15	-	10 (15 fps for hydrant laterals)	7	10 [3]
	Maximum Allowable Head Loss at Peak Flow (ft/1000 ft)	15	10	10	5-7 (<16-inch) 2-3 (16-inch and greater)	-	10	10

[1] Source: 2000 Water Master Plan
[2] Source: City of Carlsbad Engineering Standards (Volume 2 – Potable and Recycled Water Standards, 2016 Edition)
[3] Pipe integrity will be considered on velocity requirements. District may consider variations to velocity requirements based on pipe age, material, and condition.

Table 5 Recycled System Planning Criteria

Parameter	Criteria	Recommended for OMWD Recycled Water Master Plan
Demand Condition	Average Day Demand (ADD)	1.0 x ADD (Average Annual Demand over 24-hrs)
	Maximum Day Demand (MDD)	NWQ : 2.4 – 2.8 x ADD depending on pressure zone SEQ: 2.1 – 4.3 x ADD depending on pressure zone
	Peak Hour Demand (PHD)	NWQ: 5.5 – 7.9 x ADD depending on pressure zone SEQ: 4.0 – 12.7 x ADD depending on pressure zone
	Irrigation Duration	8-hour irrigation (10 pm to 6 am)
System Pressure	Minimum Pressure	60 psi under PHD; 20-40 psi acceptable in areas with private pump
	Maximum Pressure	<200 psi or pressure rating of pipelines
Pipeline	Maximum velocity	10 fps @ PHD
	Maximum head loss of existing pipelines	10 ft/1,000 ft
	Roughness Coefficient (Hazen-Williams)	120 (< 12-inch); 130 (>12-inch)
	Minimum Diameter	6-inch
Storage	Total Pressure Zone Storage	150% MDD (with Seasonal Storage Provided by Suppliers)
Pump Station	Minimum Number of Pumps	3 (1 jockey pump, 1 duty pump, and 1 standby pump)[1]
	For Pressure Zones with Storage	Duty pump(s) to meet MDD with largest pump out of service
	For Pressure Zones without Storage	Duty pump(s) to meet PHD with largest pump out of service

Note:
1. The required number of pumps will need to be verified on a case-by-case basis against proposed demands and peaking factor.

Tables 7 through 16 10-year CIP Budget for Potable and Recycled by System

10-Year CIP Project Description	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Table 7 Planning/Water Supply										
San Dieguito Valley Groundwater Desal	$417,000	$344,000	$1,146,000	$1,921,000	$3,098,000	$2,922,000	$1,814,000	$28,010,000	$29,153,000	
PW and RCW Master Plan Update	$117,000					$550,000				
Subtotal - Planning/Water Supply	$534,000	$344,000	$1,146,000	$1,921,000	$3,098,000	$3,472,000	$1,814,000	$28,010,000	$29,153,000	$0
Table 8 Site Improvements	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
OMWD Parking and Access Improvements						$255,000				
EFRR Parking Lot Expansion	$381,000	$909,000								
Site Asphalt Improvements	$60,000	$50,000	$30,000	$30,000	$30,000					
Subtotal - Site Improvements	$441,000	$959,000	$30,000	$30,000	$30,000	$255,000	$0	$0	$0	$0
Table 9 E&I/Technology	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Advanced Metering Infrastructure (AMI)	$715,000									
CIS Infinity System Upgrade	$213,000	$184,000								
District Wide SCADA Upgrades	$127,000									
District-Wide PLC Replacements (PW/RCW)	$1,237,000									
District Wide Physical Security Improve	$52,000									
Fleet Electrification Project (PW/RCW)	$165,000	$750,000	$1,490,000							
Subtotal - E&I/Technology	$2,509,000	$934,000	$1,490,000	$0	$0	$0	$0	$0	$0	$0
Table 10 Distribution System - Pipeline	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
RSF Unit A North PL Repl	$1,428,000									
Golem 14" Pipeline Inspection and Rehab	$133,000									
Dusty Trail PL Replacement	$120,000	$710,000	$350,000							
Rancho La Cima/Aliso Canyon PL Relocation	$102,000	$150,000								
Harris Ranch Right-of-Way Acquisition		$150,000								
Unit B & K Rehab	$327,000	$1,000,000	$580,000							
Unit B & K EM CCTV Inspect & Rehab Ph 2				$412,000	$1,838,000					
Encinitas Blvd Pipeline Inspection/ Rehab	$271,000	$403,000								
Encinitas Blvd Pipeline Replacement							$710,000	$5,280,000	$2,110,000	
RSF Rd Pipeline Inspection		$164,000	$524,000							
RSF Rd Pipeline Replacement									$655,000	$675,000
Access improve pipe below Gano to SDR	$20,000	$55,000								
Long-term Pipeline Budget per HDR						$50,000				
Subtotal - Pipeline	$2,401,000	$2,632,000	$1,454,000	$412,000	$1,838,000	$50,000	$710,000	$5,280,000	$2,765,000	$675,000
Table 11 Distribution System - Tanks	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Tank Safety Improvements	$516,000								$200,000	$700,000
Palms I and II Reservoirs Replacemt	$194,000	$303,000	$1,212,000							
Concrete Tank Condition Assessment						$275,000				
Gano Reservoir Improvements									$27,000	$178,000
Gaty I Reservoir Decommissioning				$398,000						
Berk Reservoir Improvements									$9,000	$53,000
Subtotal - Tanks	$710,000	$303,000	$1,212,000	$398,000	$0	$275,000	$0	$0	$236,000	$931,000

Table 12 Distribution System - Pressure Z	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Village Park PRS Replacement	$969,000									
Gardendale PRS Replacement	$984,000									
Del Lago PRS Replacement		$123,000	$846,000							
SE #1 PRS Replacement					$135,000	$936,000				
Quail Gardens PRS Replacement									$152,000	$1,075,000
Via Valle Verde PSR Replacement									$152,000	$1,075,000
Replace Maryloyd Pump Station									$510,000	
Subtotal - Pressure Zones	$1,953,000	$123,000	$846,000	$0	$135,000	$936,000	$0	$0	$814,000	$2,150,000

Table 13 DCMWTP	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
DCMWTP 4th Stage Centrifuge Addition	$2,956,000									
DCMWTP Chlorine Gen Rm Lining Rehab	$123,000									
DCMWTP Gen WTP Inspect & Cond Assess						$500,000				
DCMWTP 2nd Stage Mem Train Overhaul	$126,000	$100,000	$100,000							
DCMWTP 2nd Stage Basin Rehab/Beam Rep	$577,000	$1,207,000								
DCMWTP 1st Stage Beam Replacement	$560,000	$980,000	$666,000							
DCMWTP Inlet Strainer MOV Actuator Repl	$63,000									
DCMWTP Combined Filter Influent & Backwash Pipe Replacement	$180,000	$528,000								
DCMWTP Raw Water Equal Tanks Rehab	$668,000									
DCMWTP Fluoride Room, Permeate Pump Stanchion, Bldg Rehab		$142,000								
DCMWTP 1st Stage Basins Rehab			$1,295,000	$1,295,000	$1,295,000	$1,295,000	$1,295,000			
DCMWTP FCV Actuators Replacement			$310,000							
DCMWTP BWWEQ Tank Rehab			$596,000							
DCMWTP Plate Settler Coating Rehab				$123,000						
DCMWTP Brine Area Rehab				$192,000						
DCMWTP Sodium Hypochlorite Rm Rehab					$98,000					
DCMWTP HVAC Replacement					$46,000					
DCMWTP Septic Pipe Relining & Cleaning						$469,000				
DCMWTP RWEQ BFVs Replacement Project						$525,000				
DCMWTP Backpulse Tanks Repl Project							$849,000			
DCMWTP Plate Settlers MOV Act Repl							$33,000			
DCMWTP Sodium Hypochlorite Gen Rehab								$959,000		
DCMWTP WTP Replace Strainer Iso Valves						$90,000				
DCMWTP Replace Chemical Feed Systems						$100,000	$103,000	$106,000		
DCMWTP Replace Chem Storage Systems						$215,000	$222,000	$228,000		
DCMWTP WTP Repl Main Compressors						$194,000				
DCMWTP Replace Strainers									$1,073,000	
DCMWTP Bridge Crane Coating Rehab										$112,000
DCMWTP Bridge Crane Rehab	$65,000									
Subtotal - DCMWTP	$5,318,000	$2,957,000	$2,967,000	$1,610,000	$1,439,000	$3,388,000	$2,502,000	$1,293,000	$1,073,000	$112,000

Table 14 Annually Recurring Projects	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
E&I/Technology										
Network Security	$100,000	$104,000	$109,000	$114,000	$119,000	$124,000	$129,000	$133,000	$137,000	$141,000
Replace Pumps and Motors	$175,000	$180,000	$185,000	$191,000	$197,000	$203,000	$209,000	$215,000	$221,000	$228,000
Distribution System - Pipeline	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Replace Potable Meters	$830,000	$927,000	$849,000	$874,000	$900,000	$927,000	$955,000	$984,000	$1,014,000	$1,044,000
Replace Pipelines	$500,000	$515,000	$530,000	$546,000	$562,000	$579,000	$596,000	$614,000	$632,000	$651,000
Replace Valves	$750,000	$773,000	$796,000	$820,000	$845,000	$870,000	$896,000	$923,000	$951,000	$980,000
Steel Mains Protection	$304,000	$313,000	$322,000	$332,000	$342,000	$352,000	$363,000	$374,000	$385,000	$397,000
Impressed current system protection			$74,000	$63,000	$50,000	$135,000	$152,000			
Replace Meter Anodes	$158,000	$163,000	$168,000	$173,000	$178,000	$183,000	$188,000	$194,000	$200,000	$206,000
Distribution System - Tanks	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Rehab Concrete Tanks	$25,000	$26,000	$27,000	$28,000	$29,000	$30,000	$31,000	$32,000	$33,000	$34,000
Distribution System - Pressure Zone	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Replace PRS Valves	$54,000	$56,000	$58,000	$60,000	$62,000	$65,000	$68,000	$71,000	$73,000	$75,000
DCMWTP	**FY 25**	**FY 26**	**FY 27**	**FY 28**	**FY 29**	**FY 30**	**FY 31**	**FY 32**	**FY 33**	**FY 34**
Replace DCM WTP Membranes	$936,000	$973,000	$1,012,000	$1,052,000	$1,094,000	$1,138,000	$1,184,000	$1,231,000	$1,280,000	$1,331,000
Misc Equipment and Instrumentation Repl	$100,000	$106,000	$115,000	$124,000	$134,000	$145,000	$157,000	$170,000	$184,000	$199,000
Membrane Train Control Wiring Repl	$35,000	$36,000	$37,000	$38,000	$39,000	$40,000	$41,000	$42,000	$43,000	$44,000
Subtotal - Potable Annually Recurring	$3,967,000	$4,172,000	$4,282,000	$4,415,000	$4,551,000	$4,791,000	$4,969,000	$4,983,000	$5,153,000	$5,330,000
Total Potable	$17,833,000	$12,424,000	$13,427,000	$8,786,000	$11,091,000	$13,167,000	$9,995,000	$39,566,000	$39,194,000	$9,198,000

Table 15 Recycled	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Manchester Recycled Pipeline Ext.	$129,000									
Calle Barcelona, VP, & Summerhill Exten	$3,298,000									
Wanket RW Reservoir Rehabilitation	$157,000									
Santa Fe Valley RW Reservoir Improve	$150,000									
Off-Spec and High-Flow Diversion Pipeline	$244,000							$10,000	$40,000	
Upgrade Filter Electrical	$17,000	$101,000								
Upgrade Flow Equalization Basins			$382,000	$2,227,000						
Recycled Water Storage Pond Upgrades				$390,000	$2,278,000					
Repl Recycled Water Pump Station VFDs								$243,000		
Site Paving Improvements									$63,000	$134,000
Replace Main Switchboard S (MSB-S) ATS	$75,000	$439,000								
Repl WRF Elect Conduits, Enclose,	$22,000	$125,000								
Rehabilitation of Generator Enclosure Top			$8,000							
Chemical Area Upgrades			$37,000							
Replace Roll-Up Doors						$91,000				
Subtotal - Recycled	$4,092,000	$665,000	$427,000	$2,617,000	$2,278,000	$91,000	$0	$253,000	$103,000	$134,000

Table 16 Annually Recurring Projects	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Recycled Conversions	$65,000	$80,000	$100,000	$73,000	$76,000	$79,000	$82,000	$85,000	$88,000	$91,000
Replace Recycled Meters	$30,000	$41,000	$52,000	$54,000	$56,000	$58,000	$60,000	$62,000	$64,000	$66,000
Replace Recycled Pipeline	$50,000	$52,000	$54,000	$56,000	$58,000	$60,000	$62,000	$64,000	$66,000	$68,000
Replace Recycled Valves	$75,000	$77,000	$79,000	$81,000	$83,000	$85,000	$88,000	$91,000	$94,000	$97,000
4S WRF Physical Security Upgrades	$12,000	$12,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
Plant A Rehabilitation						$25,000	$26,000	$27,000	$28,000	$28,000
Valve and Gate Replacement Program		$10,000	$20,000	$30,000	$40,000	$52,000	$53,000	$55,000	$56,000	$58,000
Small Pump and Motor Repl Program	$80,000	$85,000	$90,000	$96,000	$101,000	$106,000	$109,000	$113,000	$116,000	$120,000
Instrumentation Replacement Program				$10,000	$16,000	$33,000	$34,000	$36,000	$36,000	$38,000
Misc Equip. Replacement Program	$12,000	$12,000	$14,000	$16,000	$18,000	$7,000	$7,000	$7,000	$7,000	$8,000
Mech and Yard Piping Repl Program				$16,000	$20,000	$77,000	$80,000	$82,000	$84,000	$87,000
Subtotal - Recycled Annually Recurring	$324,000	$369,000	$415,000	$438,000	$474,000	$588,000	$607,000	$628,000	$645,000	$667,000
Total Recycled	$4,416,000	$1,034,000	$842,000	$3,055,000	$2,752,000	$679,000	$607,000	$881,000	$748,000	$801,000
Total Potable and Recycled	$22,249,000	$13,458,000	$14,269,000	$11,841,000	$13,843,000	$13,846,000	$10,602,000	$40,447,000	$39,942,000	$9,999,000