

Wastewater Master Plan Update

JUNE 2024

Prepared for:

OLIVENHAIN MUNICIPAL WATER DISTRICT

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ES Executive Summary

Olivenhain Municipal Water District (OMWD, District) is a Municipal Water District serving as a water purveyor and wastewater utility for landowners and residents in North-San Diego County. The District is organized and operating pursuant to Water Code Sections 71000 et seq. and was originally incorporated on April 9, 1959. In 1998, OMWD annexed the 4S Ranch Sanitation District from the County of San Diego and subsequently expanded sewer service to the 4S Ranch and the Rancho Cielo developments. **Figure ES-1** presents the major District wastewater infrastructure development phases with significant milestones and upgrades over the past 35 years.

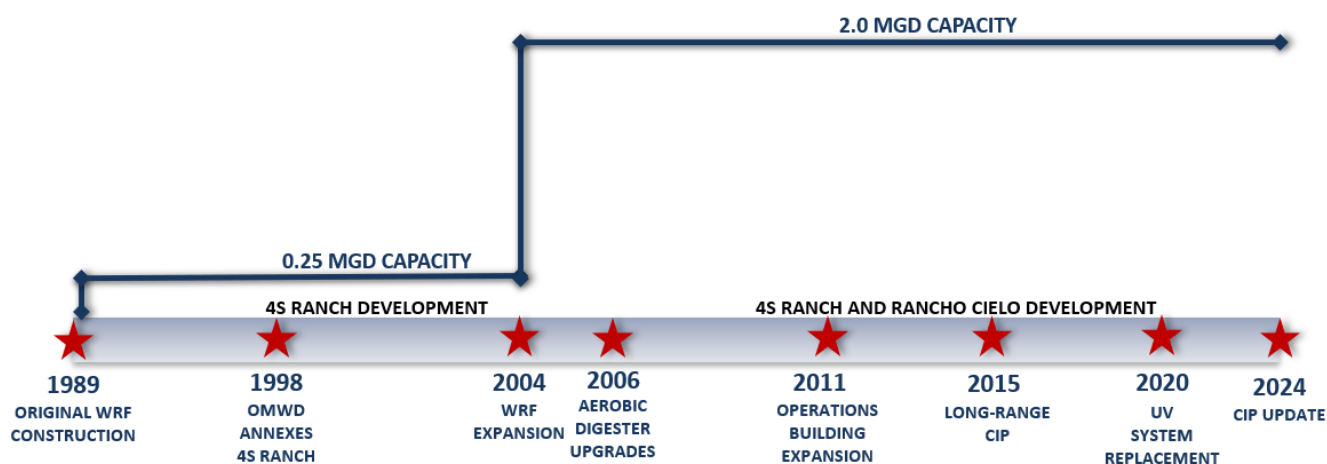


Figure ES-1. OMWD Wastewater System Development Timeline

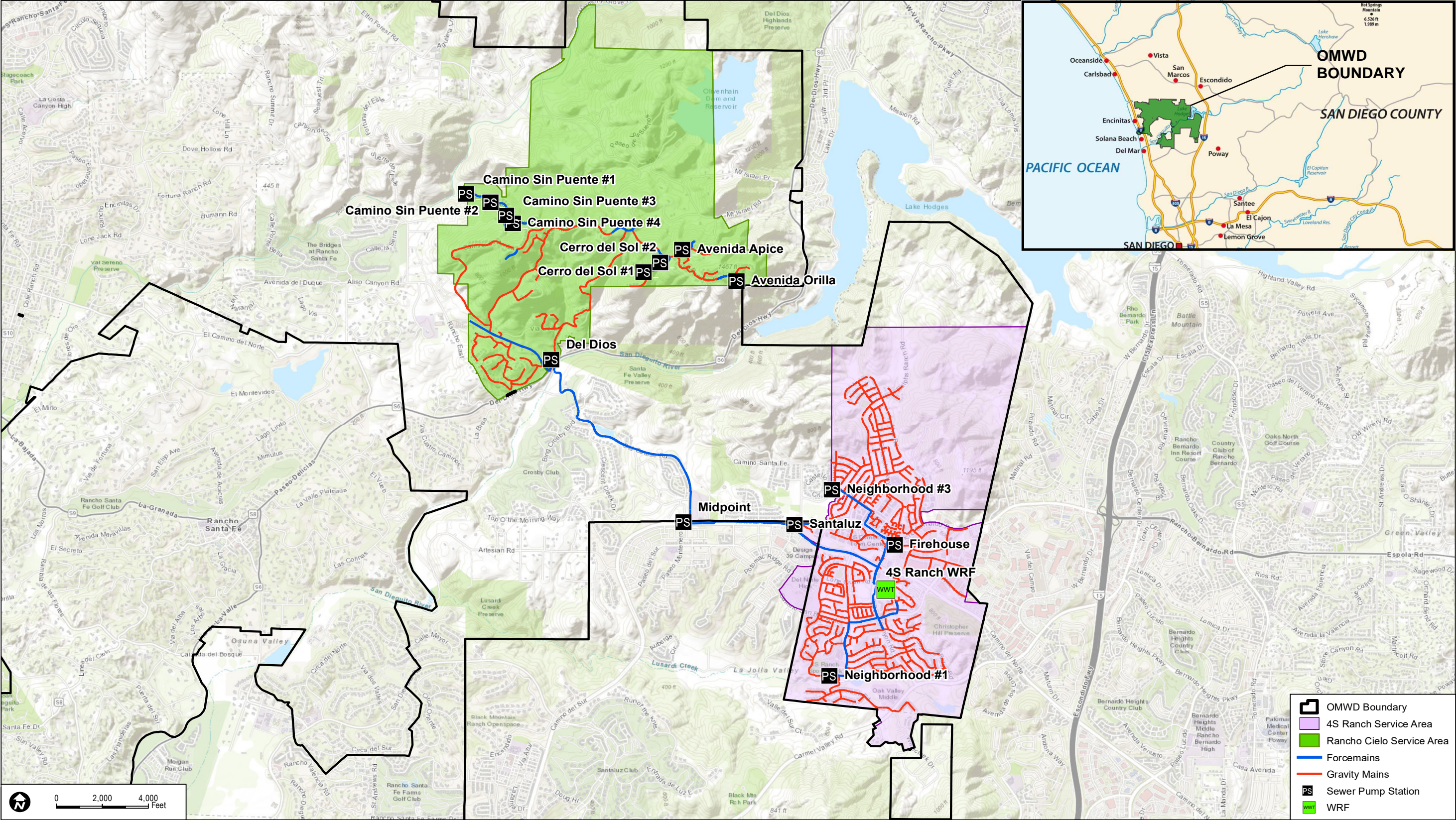
The District's wastewater system provides sewer service to approximately 6,600 customers in the 4S Ranch and Rancho Cielo service areas and includes the 2.0 million gallon per day 4S Ranch WRF, 60 miles of wastewater collection system piping, and 14 pump stations as summarized in **Table ES-1**. **Figure ES-2** presents the OMWD wastewater service area and major facilities including the 4S Ranch WRF, collection systems, and pump stations.

This Wastewater Master Plan Update forms the basis for the OMWD Capital Improvement Plan (CIP) budget process, however, it does not include ongoing projects and other District strategic efforts. The purpose of the CIP is to develop 10-year prioritized infrastructure planning and budgeting estimates for the District's wastewater infrastructure to ensure continued high-quality service for OMWD wastewater customers. The CIP is intended to support long-term financial planning including wastewater rate adjustments, and includes a description of the study methodology, descriptions of unique and programmatic CIP projects and estimated budgets, and a 10-year implementation plan. The technical analysis that provides backup to the defined projects is included in a series of technical memoranda in the report.

Table ES-1. Sewer Pump Station Summary

No.	Name	Year	Service Area	Capacity
1	Avenida Apice	2008	Rancho Cielo	100 gpm @ 50 ft TDH
2	Avenida Orilla	2008	Rancho Cielo	115 gpm @ 165 ft TDH
3	Camino Sin Puente #1	2008	Rancho Cielo	50 gpm @ 150 ft TDH
4	Camino Sin Puente #2	2008	Rancho Cielo	50 gpm @ 150 ft TDH
5	Camino Sin Puente #3	2008	Rancho Cielo	50 gpm @ 150 ft TDH
6	Camino Sin Puente #4	2008	Rancho Cielo	50 gpm @ 150 ft TDH
7	Cerro Del Sol #1	2008	Rancho Cielo	135 gpm @ 150 ft TDH
8	Cerro Del Sol #2	2008	Rancho Cielo	145 gpm @ 120 ft TDH
9	Del Dios	2005	Rancho Cielo	1,014 gpm @ 435 ft TDH
10	Midpoint	2005	Rancho Cielo	850 gpm @ 193 ft TDH
11	Fire House	2009	4S Ranch	750 gpm @ 120 ft TDH
12	Neighborhood #1	2001	4S Ranch	1,360 gpm @ 225 ft TDH
13	Neighborhood #3	2004	4S Ranch	1,600 gpm @ 209 ft TDH
14	Santaluz	2004	4S Ranch	120 gpm @ 45 ft TDH

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DUDEK SOURCE: Olivenhain MWD 2024; SanGIS 2015; ESRI Basemap 2024

8664 Olivenhain MWD Project

FIGURE ES-2
Overall District Map

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Methodology

The scope of work for development of this CIP includes evaluation and data analysis to update, refine, and add new project recommendations to the District's CIP originating from the 2015 Capital Improvement Plan based on new information and developments over the past 9 years. The approach consists of two-phases, assessment and CIP development, for both the collection system and water recycling facility as described in the following subsections. **Figure ES-3** illustrates the approach undertaken for CIP development.

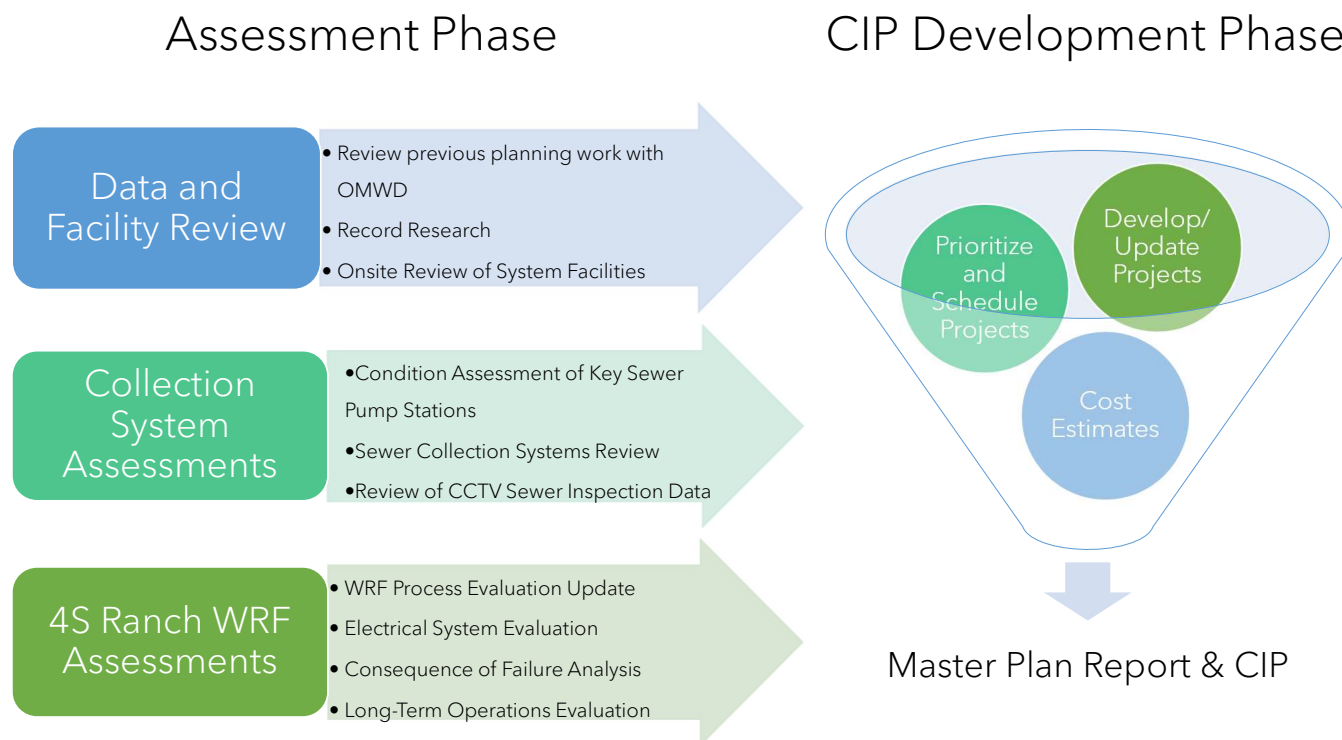


Figure ES-3. CIP Development Approach

Assessment Phase

Collection System Assessments

Collection System assessments include a condition assessment to observe and assess the condition of mechanical equipment, structures, and piping at the District's three key sewer pump stations (Neighborhood #3 SPS, Midpoint SPS, and Del Dios SPS). In some cases, District staff have provided information regarding the condition of mechanical and electrical equipment which the Dudek team would not otherwise see or detect. In lieu of site investigations at the remaining eleven stations, collection systems workshops were held involving Dudek staff, sub-consultant RCS, and District personnel. The workshops identified insights into operational performance, safety risks, and equipment history, coordinating new recommended improvements with those outlined in the CIP plan included in the 2015 OMWD SSMP. Assets at each sewer pump station are organized into one of four specific disciplines as follows.

- **Site**: Civil elements including grading, paving, perimeter fencing, access, and utilities.
- **Mechanical**: Pumps, piping, valves, mechanical equipment, and HVAC within the pump station.
- **Structural**: Facility structures including below-grade concrete structures, wetwell pump station, vaults, and superstructures, as applicable.
- **Electrical & Instrumentation**: Electrical service, emergency power, motor controls, instruments, and control panels.

4S Ranch WRF Assessments

Comprehensive review and benchmarking were conducted for WRF operations and major process units through analyses of available data on plant conditions and operating performance, workshops, and assessments. Dudek facilitated a Consequence of Failure Analysis (CoFA) for wastewater treatment, recycled water, and electrical unit processes through workshops with District staff involving deliberate discussion and analysis of the criticality of process systems. The CoFA findings are used to establish a risk-based priority designation. Based on this designation and the nature of the defined failure mode, operational and/or capital-based recommendations are made to mitigate the risk by reducing the defined consequence and/or probability of failure.

CIP Development Phase

Cost estimates are prepared for CIP projects and account for major equipment and material quantities and unit prices with multipliers for sales tax, delivery, installation, and contractor overhead and profit. Sub-disciplines (e.g., electrical, controls) are estimated using analogous multipliers. Soft costs (e.g., engineering, construction support services, and administration) and contingency are added to the construction cost subtotal based on project complexity and scale. An annual escalation rate of 3% per year is applied to each project to adjust project cost estimates for inflation. Estimates are defined as Association for Advancement of Cost Estimating (AACE) Class 5.

Prioritized CIP List

CIP project recommendations are prioritized into one of five categories as described in **Table ES-2**.

Table ES-2. Priority Designations

Priority	Description
Extra High	Proactive planning and risk mitigation strategy is required immediately. Capital improvement projects and operations and maintenance strategies must be developed and implemented as soon as possible to mitigate risk to an acceptable level. Recommend that applicable CIP projects are expedited where practical.
High	Proactive planning and risk mitigation strategy is required. Capital improvement projects are recommended if operations and maintenance strategies are insufficient to mitigate risk to an acceptable level.
Medium	Proactive strategy for monitoring performance and condition may be recommended. Mix of proactive and reactive strategies may also apply. Capital Improvement projects may be recommended to mitigate risk where applicable.
Low	Reactive strategy is acceptable. The risk level does not suggest proactive monitoring strategies or capital improvement projects are necessary in the short to medium term. CIP projects may be candidates for deferral to reduce capital budgets.
Recurrence	Involves regular maintenance, repair, or replacement of infrastructure components to address wear and tear, failure, and/or changing conditions. Recurring budget allows for necessary maintenance to be carried out in a timely manner to prevent service disruptions.

Collection system projects are prioritized based on the results of the site investigations, collaborative workshops with the District, historical data, and overall engineering experience. The primary drivers of project need are based on the technical analyses including remaining useful life, condition assessment and/or operations assessment.

Wastewater treatment projects are prioritized primarily based on the results of the Consequence of Failure Analysis, and supported by the WRF process evaluation update, electrical system evaluation, and long-term operations evaluation.

10-Year CIP

The 10-year CIP recommends a project implementation schedule based on priority while also establishing recurring annualized budgets for maintenance and replacement of equipment and other assets. **Figure ES-4** presents the summary of the 10-year CIP budget. Annual CIP estimates are differentiated by budget category to assist the District in preparing financing plans and rate studies in compliance with Proposition 218. This Wastewater Master Plan Update forms the basis for the OMWD CIP budget process, however, it does not include ongoing projects and other District strategic efforts. The budget categories include: 4S Ranch WRF Wastewater (WW), 4S Ranch WRF Recycled Water (RW), and Wastewater Collection System (CS). Note that the WW projects include solids handling facilities and liquid stream processes through the secondary clarifiers while RW projects include secondary effluent equalization basins, tertiary treatment, UV disinfection, and recycled water storage and pumping facilities. General projects at the WRF are shared by both WW and RW.

The evaluation updates the 2015 CIP recommendations by identifying new projects and re-prioritizing previously identified projects. The significant extra high and high priority projects recommended in the near future are:

- Replace the existing WRF Main Switchboard S (MSB-S) and automatic transfer switch (ATS).
- Replace the existing 75 HP digester blower, which has reached the end of its useful life.
- Replace WRF electrical conduits, enclosures, and lighting.
- Upgrade WRF tertiary filtration system electrical components.
- Replace Del Dios SPS wet well and storage tank liners.
- Replace Neighborhood #3 SPS wet well liner.

In addition to the extra high and high projects in years 1-2, recommended projects which are higher than \$500,000, in 3-5 years include:

- Upgrades to flow equalization basins.
- Upgrades to Recycled Water Storage Pond.
- Improvements to Del Dios SPS.
- Improvements to Midpoint SPS.

Fiscal year budgets for WW, RW, and CS are provided in **Table ES-3**. The CIP project list is provided in **Table ES-4**.

Next Steps

Upon adoption of the 2024 Wastewater Master Plan, OMWD will utilize the CIP recommendations, cost estimates, and technical assessments to update the 10 Year CIP budget, which includes ongoing projects and other District strategic efforts outside of the scope of this report. The technical analysis and project recommendations made in this report serve as a guide for the District’s reference when revisiting the capital improvement budget in future years. Over time, it is expected that project needs and budgets will be modified to meet the immediate needs of the District.

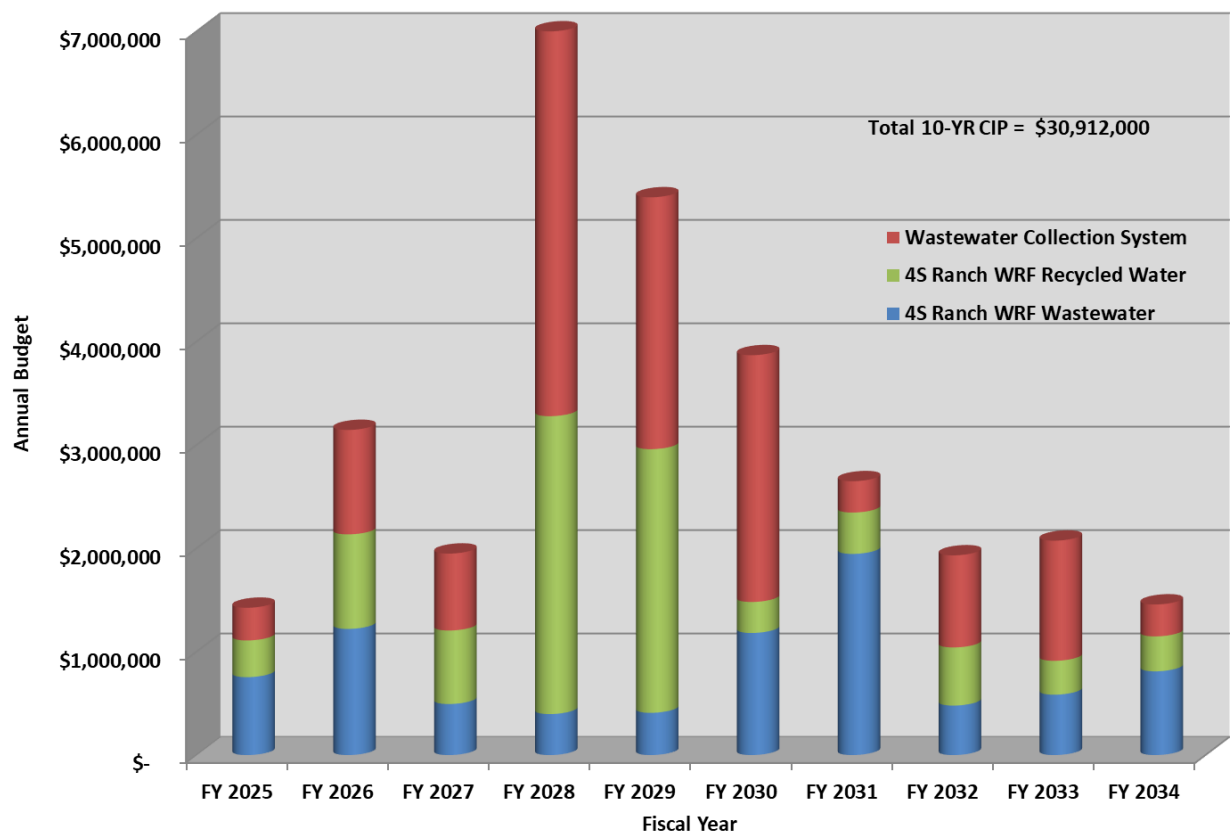


Figure ES-4. Capital Improvement Plan, 10-Year Budget

Table ES-3. Capital Improvement Plan, 10-Year Budget

Budget Category	Fiscal Year (FY) Budget (in thousands)											
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total	Average
4S Ranch WRF WW	\$754	\$1,220	\$494	\$397	\$409	\$1,181	\$1,946	\$479	\$584	\$810	\$8,273	\$827
4S Ranch WRF RW	\$355	\$915	\$711	\$2,881	\$2,550	\$300	\$400	\$562	\$328	\$338	\$9,341	\$934
Wastewater CS	\$316	\$1,010	\$744	\$3,740	\$2,436	\$2,387	\$303	\$891	\$1,162	\$309	\$13,298	\$1,330
Total	\$1,425	\$3,145	\$1,949	\$7,018	\$5,395	\$3,868	\$2,649	\$1,932	\$2,074	\$1,457	\$30,912	\$3,091

Table ES-4. CIP Project List

Project No.	Project Name	Priority	Total Cost	Funding (WW / RW / Split)	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035+
4S Ranch Water Reclamation Facility (WRF) CIP Project List															
WRF - 5.1	Replace Existing 75 HP Digester Blower	Extra High	\$ 246,000	WW	\$ 246,000										
WRF - 12.1	Replace Main Switchboard S (MSB-S) and Automatic Transfer Switch	Extra High	\$ 1,285,000	Split WW/RW	\$ 188,000	\$ 1,098,000									
WRF - 12.2	Replace WRF Electrical Conduits, Enclosures, and Lighting	High	\$ 367,000	Split WW/RW	\$ 54,000	\$ 313,000									
WRF - 8.1	Upgrade Filter Electrical	High	\$ 116,000	RW	\$ 17,000	\$ 101,000									
WRF - 11.1	Rehabilitation of Generator Enclosure Top	High	\$ 22,000	Split WW/RW			\$ 21,000								
WRF - 7.1	Upgrade Flow Equalization Basins	High	\$ 2,608,000	RW			\$ 382,000	\$ 2,227,000							
WRF - 4.1	Replace RAS Pump Station Suction Valves	Medium	\$ 68,000	Split WW/RW			\$ 68,000								
WRF - 6.1	Chemical Area Upgrades	Medium	\$ 92,000	Split WW/RW			\$ 92,000								
WRF - 10.2	Recycled Water Storage Pond Upgrades	Medium	\$ 2,669,000	RW				\$ 390,000	\$ 2,278,000						
WRF - 1.1	Upgrade Headworks Odor Control Scrubber	Medium	\$ 1,577,000	WW						\$ 231,000	\$ 1,346,000				
WRF - 15.6	Wastewater Master Plan Update	Medium	\$ 500,000	WW						\$ 500,000					
WRF - 14.1	Replace Roll-up doors	Low	\$ 227,000	Split WW/RW							\$ 227,000				
WRF - 10.1	Replace Existing Recycled Water Pump Station VFDs	Low	\$ 243,000	RW								\$ 243,000			
WRF - 2.1	Biological Treatment Upgrade (Process Study & Pre-Design)	Low	\$ 92,000	WW									\$ 92,000		
WRF - 2.2	Upgrade Plant B Oxidation Ditch Aeration System	Low	\$ 2,072,000	WW										\$ 303,000	
WRF - 3.1	Connect Plant B clarifier splitter box to Plant A Clarifiers	Low	\$ 1,249,000	WW											
WRF - 2.3	Plant A Rehabilitation	Recurring	\$ 622,000	Split WW/RW	\$ 54,000	\$ 56,000	\$ 58,000	\$ 59,000	\$ 61,000	\$ 63,000	\$ 65,000	\$ 67,000	\$ 69,000	\$ 71,000	
WRF - 15.1	Valve and Gate Replacement Program	Recurring	\$ 1,049,000	Split WW/RW	\$ 68,000	\$ 70,000	\$ 73,000	\$ 75,000	\$ 77,000	\$ 129,000	\$ 133,000	\$ 137,000	\$ 141,000	\$ 145,000	
WRF - 15.2	Small Pump and Motor Replacement Program	Recurring	\$ 2,627,000	Split WW/RW	\$ 229,000	\$ 236,000	\$ 243,000	\$ 250,000	\$ 258,000	\$ 265,000	\$ 273,000	\$ 282,000	\$ 290,000	\$ 299,000	
WRF - 15.3	Instrumentation Replacement Program	Recurring	\$ 826,000	Split WW/RW	\$ 72,000	\$ 74,000	\$ 76,000	\$ 79,000	\$ 81,000	\$ 83,000	\$ 86,000	\$ 89,000	\$ 91,000	\$ 94,000	
WRF - 15.4	Miscellaneous Equipment Replacement Program	Recurring	\$ 163,000	Split WW/RW	\$ 14,000	\$ 15,000	\$ 15,000	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 18,000	\$ 18,000	\$ 19,000	
WRF - 15.5	Mechanical and Yard Piping Replacement Program	Recurring	\$ 1,913,000	Split WW/RW	\$ 167,000	\$ 172,000	\$ 177,000	\$ 182,000	\$ 188,000	\$ 193,000	\$ 199,000	\$ 205,000	\$ 211,000	\$ 217,000	
4S RANCH WRF 5-YEAR WASTEWATER TOTAL			\$ 3,273,000		\$ 753,600	\$ 1,220,400	\$ 493,800	\$ 396,600	\$ 408,600						
4S RANCH WRF 5-YEAR RECYCLED WATER TOTAL			\$ 7,413,000		\$ 355,400	\$ 914,600	\$ 711,200	\$ 2,881,400	\$ 2,550,400						
4S RANCH WRF 5-YEAR TOTAL			\$ 10,686,000		\$ 1,109,000	\$ 2,135,000	\$ 1,205,000	\$ 3,278,000	\$ 2,959,000						
4S RANCH WRF 10-YEAR WASTEWATER TOTAL			\$ 8,272,800		\$ 753,600	\$ 1,220,400	\$ 493,800	\$ 396,600	\$ 408,600	\$ 1,181,000	\$ 1,946,000	\$ 478,800	\$ 584,000	\$ 810,000	\$ 3,018,000
4S RANCH WRF 10-YEAR RECYCLED WATER TOTAL			\$ 9,341,200		\$ 355,400	\$ 914,600	\$ 711,200	\$ 2,881,400	\$ 2,550,400	\$ 300,000	\$ 400,000	\$ 562,200	\$ 328,000	\$ 338,000	\$ -
4S RANCH WRF 10-YEAR TOTAL			\$ 17,614,000		\$ 1,109,000	\$ 2,135,000	\$ 1,205,000	\$ 3,278,000	\$ 2,959,000	\$ 1,481,000	\$ 2,346,000	\$ 1,041,000	\$ 912,000	\$ 1,148,000	\$ 3,018,000
Project No.	Project Name	Priority	Total Cost	Funding (WW)	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035+
Collection System CIP Project List															
CS - 10.3	Sewer Pump Station Transient Surge Analyses	Extra High	\$ 9,000	WW	\$ 9,000										
CS - 10.1	Del Dios SPS Wet Well and Storage Tank Liner Replacement	Extra High	\$ 867,000	WW	\$ 127,000	\$ 740,000									
CS - 6.1	Neighborhood #3 SPS Wet Well Liner Improvements	High	\$ 85,000	WW		\$ 84,000									
CS - 10.2	Del Dios SPS Improvements	High	\$ 3,776,000	WW			\$ 552,000	\$ 3,223,000							
CS - 9.1	Midpoint SPS Improvements	Medium	\$ 2,179,000	WW				\$ 319,000	\$ 1,860,000						
CS - 6.2	Neighborhood #3 SPS Improvements	Medium	\$ 2,552,000	WW					\$ 373,000	\$ 2,179,000					
CS - 7.1	Fire House Pump Station Replacements	Medium	\$ 595,000	WW							\$ 87,000	\$ 509,000			
CS - 8.1	Santaluz Pump Station Improvements	Medium	\$ 1,094,000	WW								\$ 160,000	\$ 933,000		
CS - 15.1	Avenida Apice and Avenida Orilla Pump Station Improvements	Low	\$ 223,000	WW										\$ 33,000	
CS - 16.1	Cerro Del Sol #1 and Cerro Del Sol #2 Pump Station Improvements	Low	\$ 282,000	WW										\$ 41,000	
CS - 12.1	Camino Sin Puente #2 Pump Station Improvements	Low	\$ 532,000	WW											
CS - 11.1	Camino Sin Puente #1 Pump Station Improvements	Low	\$ 545,000	WW											
CS - 13.1	Camino Sin Puente #3 Pump Station Improvements	Low	\$ 532,000	WW											
CS - 14.1	Camino Sin Puente #4 Pump Station Improvements	Low	\$ 585,000	WW											
CS - 1.1	Collection System Pipeline Rehabilitation and Replacement	Recurring	\$ 447,000	WW	\$ 39,000	\$ 40,000	\$ 42,000	\$ 43,000	\$ 44,000	\$ 45,000	\$ 47,000	\$ 48,000	\$ 50,000	\$ 51,000	
CS - 2.1	Collection System Manhole Rehabilitation Program	Recurring	\$ 784,000	WW	\$ 68,000	\$ 71,000	\$ 73,000	\$ 75,000	\$ 77,000	\$ 79,000	\$ 82,000	\$ 84,000	\$ 87,000	\$ 89,000	
CS - 3.1	Pump Station Rehabilitation and Maintenance Program	Recurring	\$ 836,000	WW	\$ 73,000	\$ 75,000	\$ 77,000	\$ 80,000	\$ 82,000	\$ 84,000	\$ 87,000	\$ 90,000	\$ 92,000	\$ 95,000	
COLLECTION SYSTEM 5-YEAR TOTAL			\$ 8,246,000		\$ 316,000	\$ 1,010,000	\$ 744,000	\$ 3,740,000	\$ 2,436,000						
COLLECTION SYSTEM 10-YEAR TOTAL			\$ 13,298,000	\$ 31,600	\$ 316,000	\$ 1,010,000	\$ 744,000	\$ 3,740,000	\$ 2,436,000	\$ 2,387,000	\$ 303,000	\$ 891,000	\$ 1,162,000	\$ 309,000	\$ 2,624,000
DISTRICT 5-YEAR WASTEWATER TOTAL			\$ 11,519,000		\$ 1,069,600	\$ 2,230,400	\$ 1,237,800	\$ 4,136,600	\$ 2,844,600						
DISTRICT 5-YEAR RECYCLED WATER TOTAL			\$ 7,413,000		\$ 355,400	\$ 914,600	\$ 711,200	\$ 2,881,400	\$ 2,550,400						
DISTRICT 5-YEAR TOTAL			\$ 18,932,000		\$ 1,425,000	\$ 3,145,000	\$ 1,949,000	\$ 7,018,000	\$ 5,395,000						
DISTRICT 10-YEAR WASTEWATER TOTAL			\$ 21,570,800		\$ 1,069,600	\$ 2,230,400	\$ 1,237,800	\$ 4,136,600	\$ 2,844,600	\$ 3,568,000	\$ 2,249,000	\$ 1,369,800	\$ 1,746,000	\$ 1,119,000	\$ 5,642,000
DISTRICT 10-YEAR RECYCLED WATER TOTAL			\$ 9,341,200		\$ 355,400	\$ 914,600	\$ 711,200	\$ 2,881,400	\$ 2,550,400	\$ 300,000	\$ 400,000	\$ 562,200	\$ 328,000	\$ 338,000	\$ -
DISTRICT 10-YEAR TOTAL			\$ 30,912,000		\$ 1,425,000	\$ 3,145,000	\$ 1,949,000	\$ 7,018,000	\$ 5,395,000	\$ 3,868,000	\$ 2,649,000	\$ 1,932,000	\$ 2,074,000	\$ 1,457,000	\$ 5,642,000

Note: 2035+ Projects are not included in the 10-Year CIP Totals and are also not reflected in the recurring projects.

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