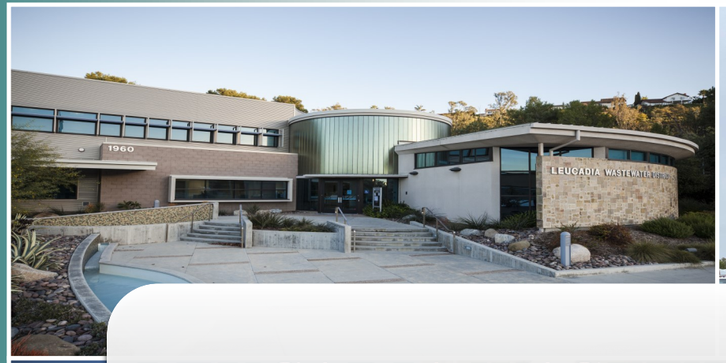
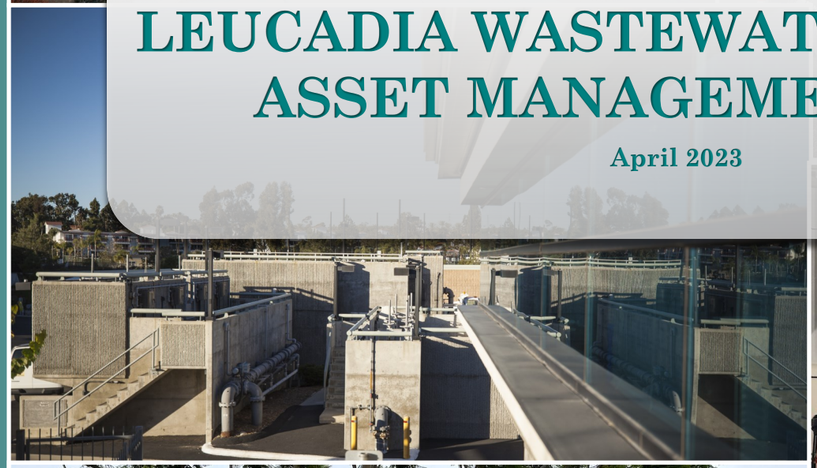


LEUCADIA WASTEWATER DISTRICT ASSET MANAGEMENT PLAN

April 2023



LEUCADIA WASTEWATER DISTRICT | LEADERS IN ENVIRONMENTAL PROTECTION

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LEUCADIA WASTEWATER DISTRICT
ASSET MANAGEMENT PLAN
2023 UPDATE

April 2023

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Job No. 103-022

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EXECUTIVE SUMMARY

The Leucadia Wastewater District (District) covers a total service area of 10,200 acres (16 square miles) which includes southern portions of the City of Carlsbad (Carlsbad) and northern portions of the City of Encinitas (Encinitas). The District provides wastewater collection, treatment, disposal and service to a population of approximately 61,000.

The District presently serves 28,774 equivalent dwelling units (EDUs), at 90% of buildout, with a buildout projection of 31,974 EDUs. This is an increase to the prior (1999) buildout projection, with a significant portion due to the potential for accessory dwelling units on single-family residential parcels, particularly in the City of Encinitas.

At present, wastewater flows are approximately 3.6 mgd, a slight decrease from the 2018 Asset Management Plan. The current wastewater generation rate is 128 gpd/EDU on average across the District. The generation rate has declined in recent years. In comparison, existing flows at the time of the 1999 Master Plan were approximately 4.0 mgd; which equates to a generation rate of 185 gpd/EDU at that time. The present per capita wastewater generation rate in the District is approximately 51 gpd (wet weather flows are included in this average).

The buildout flow projection for the District remains the same from the 2018 Asset Management Plan at 4.7 mgd (based on 133 gpd/EDU and a 10% safety factor). In comparison, the 1985 Planning Study projected 9.6 mgd (based on 238 gpd/EDU) and the 1999 Master Plan projected 6.5 mgd (based on 215 gpd/EDU) for buildout flows. Long-term pipeline model capacity evaluations are based on measured flows and attenuated pump flows to better model actual conditions. Based on these conditions, there are no pipeline capacity projects recommended.

The District's existing wastewater system encompasses approximately 200 miles of gravity sewer pipeline, 5,000 manholes, 10 pump stations, and approximately 11 miles of force mains. The District is one of six owners of the Encina Water Pollution Control Facility (WPCF) which is operated and administered by the Encina Wastewater Authority (EWA). Additionally, the District pumps secondary treated wastewater from the Encina WPCF to its Gafner Water Reclamation Plant (WRP) for tertiary treatment and then distributes the recycled water to the South La Costa Golf Course.

The District prepares its asset management plans (AMP) on a 5-year cycle in order to: (1) capture the District's progress in the management of its wastewater and recycled water assets, (2) provide recommendations for operation and assessment/replacement cycle improvements to each of the asset classes, and (3) develop the recommended 5-Year and 20-Year capital improvement program (CIP) based on District and EWA projects.

The following sections summarize the recommendations of this AMP by asset category highlighting operation and maintenance recommendations (where appropriate) and providing short-term expenditures of capital funds (i.e., 5-Year Capital Improvement Program projects). Long-term (20 year) estimates of expenditures are also provided. Note that no growth-related capital improvement projects are recommended for the District at this time based on (1) the District approaching the estimated number of buildout EDUs and (2) the quantity of wastewater per EDU on a District-wide basis has not increased.

GRAVITY SEWER PIPELINES AND MANHOLES: 5-YEAR AND 20-YEAR COSTS

- FY23 Gravity Pipeline Rehabilitation Project - $682,000
- FY23 SCADA Upgrade - $85,600
- Annual Gravity Pipeline Rehabilitation Projection (or CIP) - $790,000 per year
- Annual Miscellaneous Pipeline/Manhole/Pump Station Repair - $205,000 per year
- Annual Lateral Replacement/Backflow Preventer Program - $100,000 per year
- Annual Estimate of Headquarters Buildings Expenses - $32,333 per year

GRAVITY SEWER PIPELINES AND MANHOLES: SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

- Identify and track locations of lined manholes.
- Identify and track locations of inflow domes.
- Continue submetering in areas of known or suspected inflow and infiltration.
- Maintain a current GIS layer of the Repair Priority List.

- Populate "Yes/No" column in Repair Priority List to indicate whether the line has previously been repaired and add reference to prior project/work order as appropriate.

- Track Repair Priority List Completions, Miscellaneous Line Repairs, and Capital Improvement Projects in GIS/Inframap

- When lining a pipeline in an area with chronic root issues, the lateral joints should be addressed, via either a top hat, T-liner, or other means.

- When possible, spot repairs of pipelines should be addressed by lining the entire pipe segment, particularly on pipes greater than 40 years in age.

- Aggregate manhole linings into a stand-alone project to take advantage of economies of scale.

PUMP STATIONS:
5-YEAR AND 20-YEAR COSTS

The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 5-Year CIP.

- Batiquitos Emergency/Overflow Basin Inspection
- Batiquitos Pump Station Upgrade Project (includes the Emergency Basin Lining and Pump Installation)
- Diana Pump Station Upgrade Project
- Rancho Verde Pump Station Improvement Project
- Village Park 7 Pump Station Rehabilitation Project
- Pump Station Condition Assessment
- Annual Cathodic Protection Assessment

The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 20-Year CIP.

- Avocado Pump Station Upgrade Project
- La Costa Pump Station Replacement Project
- For financial planning purposes, in years when significant pump station or force main capital replacement projects are not occurring, expenses are anticipated based on the forecasted General Pump Station Replacement costs.

PUMP STATIONS:
SUMMARY OF RECOMMENDATIONS

- Evaluate pump size at each station based on actual flow generation rates and anticipated peak buildout flows when pump replacement dictates.

- Further evaluate bypassing the Batiquitos Pump Station (for a portion of the District's flow) by pumping directly from the Leucadia Pump Station into one of the Batiquitos force mains.

- Beyond FY24, determine future pump station inspection efforts based on the previous inspection, age of the asset, needs identified by the District, and the projected date of project implementation.

- Consider the preparation of a detailed checklist of inspection components for each station. The basis for this would be prior inspection reports by IEC (and others) with additions by staff as appropriate.

- Consider the maintenance of a pump station component tracking database. This would be used to track improvements and associated costs to better project future spending. This would combine the efforts already occurring as part of the Sewer System Management Plan (SSMP) audit process as well as the financial tracking done for capital asset depreciation.

- Continue efforts to reduce inflow and infiltration via inflow domes in manholes, smoke testing, and lining projects with lateral top hats.

FORCE MAINS:
5-YEAR COSTS, 20-YEAR COSTS, AND RECOMMENDATIONS

- The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 5-Year CIP.
  - L1 Destructive Testing
  - L1 Internal Condition Inspection
  - B3 Destructive Testing

- The following replacement-based capital improvement projects are recommended or are planned to be included in the District's 20-Year CIP:
  - B3 Internal Condition Inspection
  - L1 Final Replacement/Lining
  - B3 Final Replacement/Lining

- Include $15,000 in annual long-term capital expenses related to cathodic protection repairs and improvements.

- Update composite figures for each force main based on record drawings of recent improvements.

JOINTLY-OWNED GRAVITY SEWERS
5-YEAR COSTS AND 20-YEAR COSTS

There are no specific capital improvement projects included in the District's 5-Year or 20-Year CIP for jointly-owned gravity sewer facilities. For financial planning purposes, annual estimates of capital expenditures are provided for the Lanikai and Occidental Sewers.

ENCINA WASTEWATER AUTHORITY
5-YEAR COSTS, 20-YEAR COSTS, AND RECOMMENDATIONS

- For long-term financial planning purposes, the District's share of Encina capital costs is estimated to be approximately $84,000,000 over the next 20 years (approximately $4.2 million per year) and is based on a review of historical actual Encina capital costs to the District.

- Consider Encina Wastewater Authority long-term water reuse plans in the long-term financial planning once cost estimates have been prepared.

RECYCLED WATER
5-YEAR AND 20-YEAR COSTS

- Recycled water projects included in the 5-Year CIP include:
  - FY23 SCADA upgrade

- Recycled water projects included in the 20-Year CIP include:
  - Encina Secondary Effluent Pump Station Rehabilitation Project
  - General Pump Station Improvements (based on long-term spending needs minus planned projects)
  - B1 Force Main – La Costa Replacement
  - Gafner AWT Phase 2 Improvements

- Long-term capital replacement expenditures for the secondary effluent pump station and force main and Gafner WRF are expected to total $12,000,000 over the next 20 years

RECYCLED WATER:
SUMMARY OF RECOMMENDATIONS

- The District should inspect portions of the Encina Secondary Effluent Pump Station as part of the overall FY24 pump station condition assessment to confirm the project scope.

- Continue coordinating with other North County agencies on the North San Diego Water Reuse Coalition (NSDWRC) Regional Recycled Water Project.

- For long-term financial planning, District recycled water expenditures for pumpback facilities at Encina are estimated to total $5,036,000 over the next 20 years. The Gafner Water Reclamation Plant expenses are expected to total $6,680,000 over the next 20 years.

DISTRICT 5-YEAR CIP

Table ES-1 presents the District's recommended 5-Year CIP as a culmination of all CIP projects discussed throughout the report.

DISTRICT 20-YEAR CIP

Table ES-2 and Table ES-3 present a summary of the estimated wastewater and recycled water program expenditures by asset class, respectively, over the next 20 years (through FY2042). Table ES-4 presents the 20-Year CIP.

TABLE ES-1
LEUCADIA WASTEWATER DISTRICT 5-YEAR CIP

Location Code	Project Name	FY2023	FY2024	FY2025	FY2026	FY2027
WASTEWATER PROGRAMS						
Gravity Pipelines and Manholes						
Specific Pipeline and Manhole Replacement/Rehabilitation Projects						
0382	FY23 Gravity Pipeline Rehab Project	$682,000	-	-	-	-
-	FY24 Gravity Pipeline Rehab Project	-	$790,000	-	-	-
-	FY25 Gravity Pipeline Rehab Project	-	-	$790,000	-	-
-	FY26 Gravity Pipeline Rehab Project	-	-	-	$790,000	-
-	FY27 Gravity Pipeline Rehab Project	-	-	-	-	$790,000
	Buildout-Capacity Based Projects	-	-	-	-	-
Subtotal Specific Pipeline and Manhole Replacement/Rehabilitation Projects		*$682,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*
General Pipeline and Manhole Replacement Projects		*$0*	*$0*	*$0*	*$0*	*$0*
Additional Pipeline and Manhole Projects						
0077	Misc. Pipeline/Manhole Rehab.	$205,000	$205,000	$205,000	$205,000	$205,000
	Headquarters Building	$32,333	$32,333	$32,333	$32,333	$32,333
	FY23 SCADA Upgrades	$70,000	-	-	-	-
	Future SCADA Upgrades	$0	$0	$0	$0	$0
0368	Asset Management Plan Update	$150,000	-	-	-	-
0323	Lateral Repl./Backflow Preventer Prog.	$100,000	$100,000	$100,000	$100,000	$100,000
Total Gravity Pipelines and Manholes		**$1,239,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**
Pump Stations and Force Mains						
Specific Pump Station Improvement Projects						
0381	Village Park No. 7 PS Replacement Project	$917,000	-	-	-	-
0383	Rancho Verde Improvements	$419,000	$828,400	-	-	-
	Pump Station Condition Assessment	-	$50,000	-	-	-
0372	Diana PS Upgrade Project	-	$236,250	$708,750	-	-
0384	Batiquitos Emergency/Overflow Basin	$34,500	-	-	-	-
	Batiquitos Pump Station Rehabilitation	-	$338,000	$2,807,500	$2,119,500	-
	La Costa Pump Station Replacement	-	-	-	-	-
	Avocado Pump Station Upgrade	-	-	-	-	-
Subtotal Specific Pump Station Projects		*$1,370,500*	*$1,452,650*	*$3,516,250*	*$2,119,500*	*$0*
Force Mains						
	L1 Destructive Testing	-	$300,000	-	-	-
	L1 Condition Inspection	-	-	-	$500,000	-
	L1 Final Replacement/Lining	-	-	-	-	-
	B3 Destructive Testing	-	-	-	-	$300,000
	B3 Condition Inspection	-	-	-	-	-
	B3 Rehab/Replace Project - Phase 2	-	-	-	-	-
	Batiquitos Partial Bypass	-	-	-	-	-
O+M	Annual Cathodic Protection	$4,500	$4,500	$4,500	$4,500	$4,500
	Anode Replacement	-	-	$30,000	-	-
Subtotal Specific Force Main Projects		*$4,500*	*$304,500*	*$34,500*	*$504,500*	*$304,500*
Subtotal of Specific Pump + Force Main Replacement Projects		**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**
General Pump Station Projects		*$0*	*$0*	*$0*	*$0*	*$0*
Total Pump Stations and Force Mains		**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**
2021 Hazard Mitigation Plan Improvements						
	Batiquitos Flood Proofing (Part of Upgrade Project)	-	-	-	-	-
	Saxony Flood Protection	-	-	-	-	-
	Batiquitos and Saxony PS Flood Response and Contingency Plans	-	-	-	-	-
	Batiquitos Long-Term Flood Proofing	-	-	-	-	-
	Saxony, La Costa and Leucadia Long-Term Sea Level Rise	-	-	-	-	-
	Bridge Crossing Analysis (L2 Flex Coupling)	-	-	-	-	-
Jointly-Owned Gravity Sewers						
0361	Poinsettia Station Gravity Pipeline Project (Lanikai)	$0	-	-	-	-
	General Lanikai Replacement (District Share)	$12,000	$12,000	$12,000	$12,000	$12,000
	General Occidenal Replacement (District Share)	$41,450	$41,450	$41,450	$41,450	$41,450
Subtotal HMP+ Jointly-Owned Gravity Sewers		**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**
Subtotal Wastewater Program (No Encina)		**$2,667,783**	**$2,937,933**	**$4,731,533**	**$3,804,783**	**$1,485,283**
Encina						
0072	District Share of Encina CIP	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695
	IPR Evaluation	-	-	-	-	-
	IPR Implementation	-	-	-	-	-
Total Wastewater Program		***$6,872,478***	***$7,142,628***	***$8,936,228***	***$8,009,478***	***$5,689,978***
RECYCLED WATER PROGRAM						
	FY23 SCADA Upgrades	$3,000	-	-	-	-
	SCADA Upgrades	-	-	-	-	-
	Encina Secondary Effluent PS Rehab Project	-	-	-	-	-
	General Encina Secondary Improvements (less FM)	-	-	-	-	-
0367	B1 Force Main - North Section Replacement	$728,000	-	-	-	-
	B1 Force Main - La Costa Replacement	-	-	-	-	-
	Gafner AWT Improvements (Phase 2)	-	-	-	-	-
	General Gafner Improvements	-	-	-	-	-
Total Recycled Water Program		***$731,000***	***$0***	***$0***	***$0***	***$0***
DISTRICT TOTAL CIP EXPENSES		**$7,603,478**	**$7,142,628**	**$8,936,228**	**$8,009,478**	**$5,689,978**

TABLE ES-2
20-YEAR SUMMARY OF
WASTEWATER CIP EXPENDITURES

Asset Category	Expenditures over 20 Years
Gravity Sewer Pipelines and Manholes	$ 23,363,660
Pump Stations and Force Mains	$ 47,846,335
Jointly-Owned Gravity Sewers	$ 1,069,000
Encina Wastewater Authority Projects	$ 84,093,900
TOTAL	**$ 156,372,895**

TABLE ES-3
20-YEAR SUMMARY OF
RECYCLED WATER CIP EXPENDITURES

Asset Category	Expenditures over 20 Years
Recycled Water Pump Station and Force Main	$ 5,018,000
Gafner Water Reclamation Plant	$ 6,698,000
North County Regional Recycled Water Project	$ 0
TOTAL	**$ 11,716,000**

TABLE E-4
LEUCADIA WASTEWATER DISTRICT CAPITAL IMPROVEMENT PROGRAM - FINANCIAL ANALYSIS

Location Code	Project Name	Project Cost	20 Year Costs	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042
WASTEWATER PROGRAMS																							
Gravity Pipelines and Manholes																							
Specific Pipeline and Manhole Replacement/Rehabilitation Projects																							
0382	FY23 Gravity Pipeline Rehab Project	$682,000	$682,000	$682,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY24 Gravity Pipeline Rehab Project	$790,000	$790,000	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY25 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY26 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY27 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Buildout-Capacity Based Projects	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Specific Pipeline and Manhole Replacement/Rehabilita		*$3,992,000*	*$3,842,000*	*$682,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
General Pipeline and Manhole Replacement Projects		*$790,000*	*$11,850,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*
Additional Pipeline and Manhole Projects																							
0077	Misc. Pipeline/Manhole Rehab.	$205,000	$4,100,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000
	Headquarters Building	$32,333	$646,660	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333
	FY23 SCADA Upgrades	$70,000	$70,000	$70,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Future SCADA Upgrades	$85,000	$255,000	$0	$0	$0	$0	$0	$85,000	$0	$0	$0	$0	$85,000	$0	$0	$0	$0	$85,000	$0	$0	$0	$0
0368	Asset Management Plan Update	$150,000	$600,000	$150,000	-	-	-	-	$150,000	-	-	-	-	$150,000	-	-	-	-	$150,000	-	-	-	-
0323	Lateral Repl./Backflow Preventer Prog.	$100,000	$2,000,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Total Gravity Pipelines and Manholes		**$5,424,333**	**$23,363,660**	**$1,239,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**
Pump Stations and Force Mains																							
Specific Pump Station Improvement Projects																							
0381	Village Park No. 7 PS Replacement Project	$917,000	$917,000	$917,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0383	Rancho Verde Improvements	$1,247,400	$1,247,400	$419,000	$828,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pump Station Condition Assessment	$50,000	$50,000	-	$50,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0372	Diana PS Upgrade Project	$945,000	$945,000	-	$236,250	$708,750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0384	Batiquitos Emergency/Overflow Basin	$34,500	$34,500	$34,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos Pump Station Rehabilitation	$5,265,000	$5,265,000	-	$338,000	$2,807,500	$2,119,500				-	-	-	-	-	-	-	-	-	-	-	-	-
	La Costa Pump Station Replacement	$3,310,000	$3,310,000	-	-	-	-	-	$3,310,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Avocado Pump Station Upgrade	$816,750	$816,750	-	-	-	-	-	-	-	$816,750	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Specific Pump Station Projects		*$12,585,650*	*$12,585,650*	*$1,370,500*	*$1,452,650*	*$3,516,250*	*$2,119,500*	*$0*	*$3,310,000*	*$0*	*$816,750*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Force Mains																							
	L1 Destructive Testing	$300,000	$300,000	-	$300,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1 Condition Inspection	$500,000	$500,000	-	-	-	$500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1 Final Replacement/Lining	$3,360,000	$3,360,000	-	-	-	-	-	-	-	-	$1,680,000	$1,680,000	-	-	-	-	-	-	-	-	-	-
	B3 Destructive Testing	$300,000	$300,000	-	-	-	-	$300,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B3 Condition Inspection	$500,000	$500,000	-	-	-	-	-	-	$500,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	B3 Rehab/Replace Project - Phase 2	$4,650,000	$4,650,000	-	-	-	-	-	-	-	-	-	-	$2,325,000	$2,325,000	-	-	-	-	-	-	-	-
	Batiquitos Partial Bypass	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Annual Cathodic Protection	Misc.	$47,500	$4,500	$4,500	$4,500	$4,500	$4,500	$5,000	$5,000	$5,000	$5,000	$5,000	-	-	-	-	-	-	-	-	-	-
	Anode Replacement	$30,000	$180,000	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-
Subtotal Specific Force Main Projects		*$9,880,000*	*$9,837,500*	*$4,500*	*$304,500*	*$34,500*	*$504,500*	*$304,500*	*$35,000*	*$505,000*	*$5,000*	*$1,715,000*	*$1,685,000*	*$2,325,000*	*$2,355,000*	*$0*	*$0*	*$30,000*	*$0*	*$0*	*$30,000*	*$0*	*$0*
Subtotal of Specific Pump + Force Main Replacement Projects			*$22,423,150*	**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**	**$3,345,000**	**$505,000**	**$821,750**	**$1,715,000**	**$1,685,000**	**$2,325,000**	**$2,355,000**	**$0**	**$0**	**$30,000**	**$0**	**$0**	**$30,000**	**$0**	**$0**
General Pump Station Projects		*$750,000*	*$25,423,185*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$4,514,400*	*$2,953,125*	*$2,923,125*	*$2,953,125*	*$2,953,125*	*$2,923,125*	*$3,116,580*	*$3,086,580*
Total Pump Stations and Force Mains		**$23,215,650**	**$47,846,335**	**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**	**$3,345,000**	**$505,000**	**$821,750**	**$1,715,000**	**$1,685,000**	**$2,325,000**	**$2,355,000**	**$4,514,400**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$3,116,580**	**$3,086,580**
2021 Hazard Mitigation Plan Improvements																							
	Batiquitos Flood Proofing (Part of Upgrade Project)	$250,000	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Saxony Flood Protection	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos and Saxony PS Flood Response and Conti	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos Long-Term Flood Proofing	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Saxony, La Costa and Leucadia Long-Term Sea Level	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bridge Crossing Analysis (L2 Flex Coupling)	$100,000	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jointly-Owned Gravity Sewers																							
0361	Poinsettia Station Gravity Pipeline Project (Lanikai)	$0	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Lanikai Replacement (District Share)	$12,000	$240,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000
	General Occidenal Replacement (District Share)	$41,450	$829,000	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450
Subtotal HMP+ Jointly-Owned Gravity Sewers		**$403,450**	**$1,069,000**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**
Subtotal Wastewater Program (No Encina)		**$29,043,433**	**$72,278,995**	**$2,667,783**	**$2,937,933**	**$4,731,533**	**$3,804,783**	**$1,485,283**	**$4,760,783**	**$1,685,783**	**$2,002,533**	**$2,895,783**	**$2,865,783**	**$3,740,783**	**$3,535,783**	**$5,695,183**	**$4,133,908**	**$4,133,908**	**$4,368,908**	**$4,133,908**	**$4,133,908**	**$4,297,363**	**$4,267,363**
Encina																							
0072	District Share of Encina CIP	$4,204,695	$84,093,900	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695
	IPR Evaluation	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IPR Implementation	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Program		***$29,043,433***	***$156,372,895***	***$6,872,478***	***$7,142,628***	***$8,936,228***	***$8,009,478***	***$5,689,978***	***$8,965,478***	***$5,890,478***	***$6,207,228***	***$7,100,478***	***$7,070,478***	***$7,945,478***	***$7,740,478***	***$9,899,878***	***$8,338,603***	***$8,338,603***	***$8,573,603***	***$8,338,603***	***$8,338,603***	***$8,502,058***	***$8,472,058***
RECYCLED WATER PROGRAM																							
	FY23 SCADA Upgrades	$3,000	$3,000	$3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SCADA Upgrades	$5,000	$15,000	-	-	-	-	-	$5,000	-	-	-	-	$5,000	-	-	-	-	$5,000	-	-	-	-
	Encina Secondary Effluent PS Rehab Project	$440,000	$440,000	-	-	-	-	-	-	$440,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Encina Secondary Improvements (less FM)	$1,320,000	$1,320,000	-	-	-	-	-	-	-	$1,320,000	-	-	-	-	-	-	-	-	-	-	-	-
0367	B1 Force Main - North Section Replacement	$728,000	$728,000	$728,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B1 Force Main - La Costa Replacement	$2,530,000	$2,530,000	-	-	-	-	-	-	-	-	-	-	$2,530,000	-	-	-	-	-	-	-	-	-
	Gafner AWT Improvements (Phase 2)	$1,430,000	$1,430,000	-	-	-	$0	-	-	-	-	$1,430,000	-	-	-	-	-	-	-	-	-	-	-
	General Gafner Improvements	$350,000	$5,250,000	-	-	-	-	-	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000
Total Recycled Water Program		***$6,806,000***	***$11,716,000***	***$731,000***	***$0***	***$0***	***$0***	***$0***	***$355,000***	***$790,000***	***$1,670,000***	***$1,780,000***	***$350,000***	***$2,885,000***	***$350,000***	***$350,000***	***$350,000***	***$350,000***	***$355,000***	***$350,000***	***$350,000***	***$350,000***	***$350,000***
DISTRICT TOTAL CIP EXPENSES		**$35,849,433**	**$168,088,895**	**$7,603,478**	**$7,142,628**	**$8,936,228**	**$8,009,478**	**$5,689,978**	**$9,320,478**	**$6,680,478**	**$7,877,228**	**$8,880,478**	**$7,420,478**	**$10,830,478**	**$8,090,478**	**$10,249,878**	**$8,688,603**	**$8,688,603**	**$8,928,603**	**$8,688,603**	**$8,688,603**	**$8,852,058**	**$8,822,058**

CHAPTER 1

INTRODUCTION

The Leucadia Wastewater District (District) is located in northern, coastal, San Diego County, and is a special district that provides wastewater and recycled water services to portions of the cities of Encinitas and Carlsbad as shown in Figure 1-1.

The District's wastewater collection system consists of over 200 miles of gravity sewer and ten lift stations; wastewater treatment is provided by the Encina Wastewater Authority, of which the District is a member agency. A portion of the Encina Water Pollution Control Facility's secondary effluent is conveyed to the District's Gafner Water Reclamation Plant for further treatment and distribution to the South La Costa Golf Course.

BACKGROUND

The preparation of a master plan for a growing agency is typically driven by the parallel need to apply sound methodology to a financial plan for improvements needed for future development, and to replace existing infrastructure due to capacity or condition. In the District's case, with the vast majority of development complete, minor growth anticipated due to accessory dwelling units (ADUs), and anticipated future water conservation, the District's master plan primarily follows a replacement-based approach driven by asset condition.

To that end, in 2008, the District worked with Dexter Wilson Engineering, Inc. to develop a methodology to forecast where improvements would be required, published as the Asset Management Master Plan. In the case of pipelines and manholes, the District's largest asset classes, this meant development of a predictive failure model whereby each pipeline was assigned a set of criteria based on its installation environment (soils, slope, depth), criticality, and age, to guide the District to locations for detailed inspection. Closed-circuit television (CCTV) analyses were conducted on those locations identified as most likely to have an issue, and then planned for replacement or repair as necessary. A similar approach, on a broader level, was developed for pump stations; the history of major pump station components led to development of detailed inspections, and ultimately planned improvements.

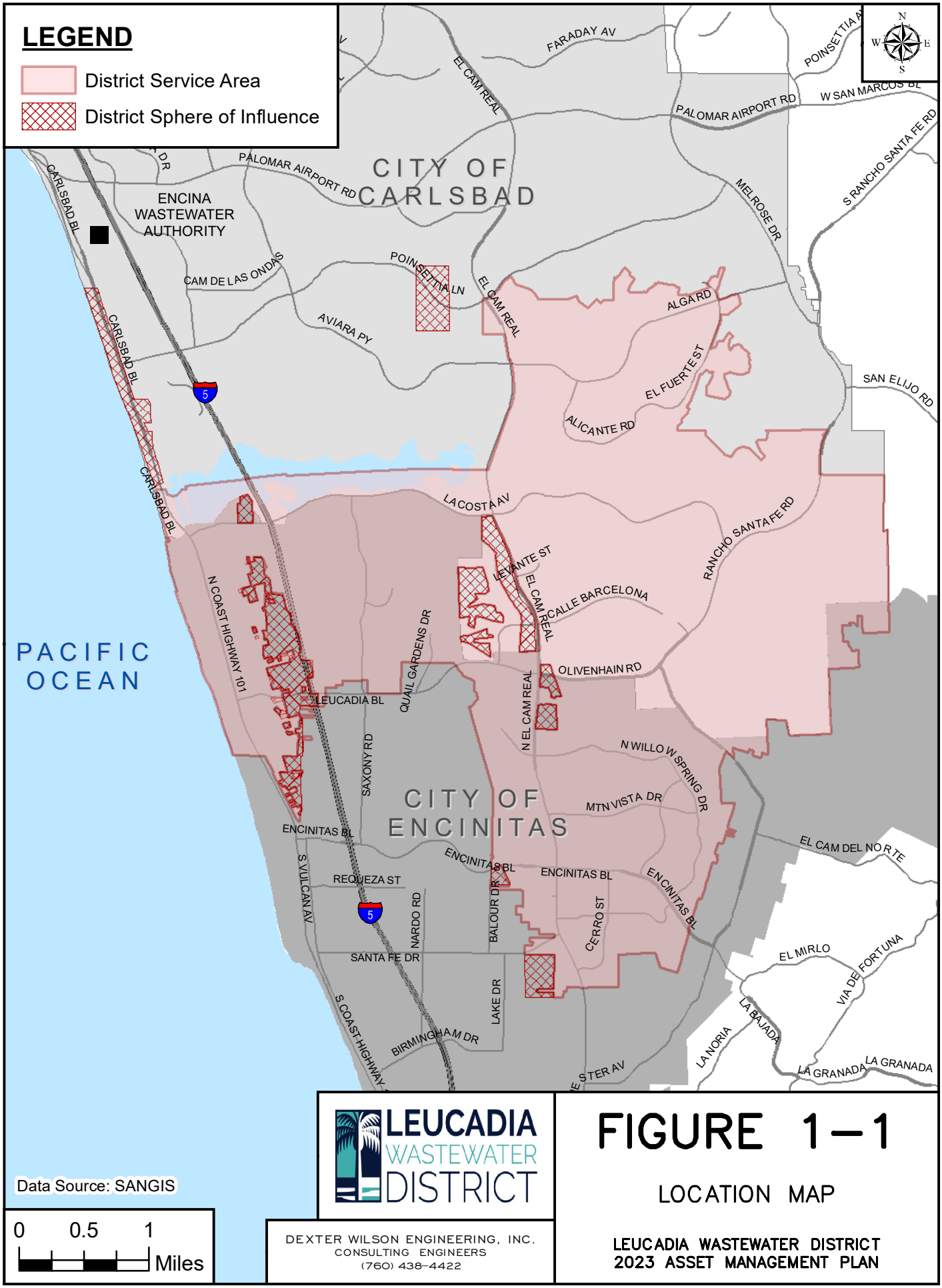

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FIGURE 1-1

LOCATION MAP

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
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In 2011, the District began to shift its primary focus of gravity pipeline maintenance from hydrocleaning to CCTV Inspection. In 2012 the District purchased a CCTV Truck, adding a second CCTV Inspection vehicle to its fleet, to increase the number of CCTV Inspections performed. The Asset Management Plan was revised in 2013 to capture the results of the asset inspections which occurred during the prior five years.

At the time the 2013 document was being developed, the District was, on average, CCTV inspecting 10 percent of the District on an annual basis. Inspection rates increased in years following with approximately 50 percent of gravity sewers inspected in 2016 and 2017, exceeding the District's Sewer System Management Plan (SSMP) CCTV goal of 33 percent per year. Since that time, and presently, inspections are regularly occurring in accordance with the target of CCTV inspecting the entire system every three years.

In 2018, the Asset Management Plan was revised and focused on the implementation of a Repair Priority List to convert the results of CCTV inspections to capital projects. It also developed a detailed update to the buildout projection of equivalent dwelling units (EDUs) in the District.

PURPOSE

The purpose of this 2023 update is four-fold, consisting of:

1. Capturing the District's progress in the management of its wastewater and recycled water infrastructure assets since 2018,

2. Providing recommendations to the asset assessment/replacement cycle by asset class,

3. Developing an updated 5-Year Capital Improvement Program (CIP) based on:
    a. Infrastructure condition assessments, and
    b. Capacity assessment. Note that although the District is largely developed, recent state legislation and local ordinances have been adopted to encourage and financially incentivize the development of ADUs. As such, an update to the District's projection of buildout EDUs is warranted. The buildout projections, and anticipated generation rates, are then utilized to evaluate long-term capacity needs in the gravity system, as well as the pump station infrastructure.
4. Developing a long-term 20-Year CIP to project critical maintenance and capital project spending requirements.

ORGANIZATION

Chapter 2 of this document provides a detailed description of the District's asset categories. Chapter 3 reviews the distribution of EDUs within the District, and the wastewater flow generation rates within the various meter basins across the District, and the District as a whole. Chapter 4 then presents the development of the Ultimate Buildout EDU projections for the District in consideration of the land use agencies' plans and recent legislation at the State and local level to encourage ADUs. With Buildout projections of EDUs, hydraulic analyses are developed to identify the need for long-term capacity-based replacement projects.

Chapter 5 focuses on the District's most significant asset classes from a quantity and value perspective – pipelines and manholes. The chapter describes the evolution of the management of these asset classes, identifies CIP projects, and provides recommendations for the future. Chapters 6 and 7 present a similar analysis for pump stations and force mains, respectively. Chapter 8 focuses on facilities which are jointly-owned with other agencies. Chapter 9 summarizes the District's ownership in the Encina Water Pollution Control Facility. Collectively, the aforementioned assets comprise the District's Wastewater Program.

Chapter 10 focuses on the District's Recycled Water Program. The anticipated capital expenditures across all the asset classes are summarized in Chapter 11 with presentation of the recommended 5-Year and 20-Year CIP plan.

REFERENCE DOCUMENTS

The following presents the list of key documents utilized in preparation of this AMP Update:

- LWD Fiscal Year 2023 Budget
- Hazard Preparedness and Mitigation Plan Update February 2021 by Titan Engineering & Consulting, LLC
- 2019 IEC Pump Station Inspection

CHAPTER 2

EXISTING SYSTEM DESCRIPTION

The District sewerage system consists of approximately 200 miles of gravity sewers, 11 miles of force main, 10 pump stations, a water reclamation plant, and a partial ownership of a treatment plant. The District collection system is split into 11 drainage basins. Figure 2-1 shows the drainage basins, pumping stations, force mains, gravity sewer pipelines, and manholes.

SETTING

The District is located in the coastal hills of northern San Diego County approximately 30 miles north of the City of San Diego. The District stretches from the coastline to about 5 miles inland. The District abuts the south and east side of the Batiquitos Lagoon. As shown in Figure 1-1, the District's service area encompasses portions of the City of Carlsbad (Carlsbad) and the City of Encinitas (Encinitas).

Topography

The lowest elevation in the District is sea level. Sea level elevations are found along the coast and along the shoreline of the Batiquitos Lagoon. The highest elevations in the District are on the east side and reach approximately 600 feet above sea level. The District is dominated by valleys and mesa tops with steep bluffs.

Weather and Rainfall

The major influence on weather in the District is the Pacific Ocean. The ocean moderates summer heat and winter cold. The mean temperatures in the District vary from a January low of 55°F to an August high of 75°F. Winds are predominantly from the ocean.

LEGEND

- District Service Area
- District Sphere of Influence

Existing Drainage Basin

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- Flows out of District

Facilities

- Gravity Sewer
- Pump Station
- Force Main

PACIFIC OCEAN

CITY OF CARLSBAD

CITY OF ENCINITAS

CITY OF SAN MARCOS

COUNTY OF SAN DIEGO

LA COSTA

LEUCADIA

SAXONY

BATIQUITOS

AVOCADO

DIANA

ENCINITAS ESTATES

VILLAGE PARK 5

VILLAGE PARK 7

RANCHO VERDE

0 1,500 3,000 6,000 Feet

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
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LEUCADIA WASTEWATER DISTRICT

FIGURE 2-1

EXISTING COLLECTION SYSTEM AND DRAINAGE BASINS

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

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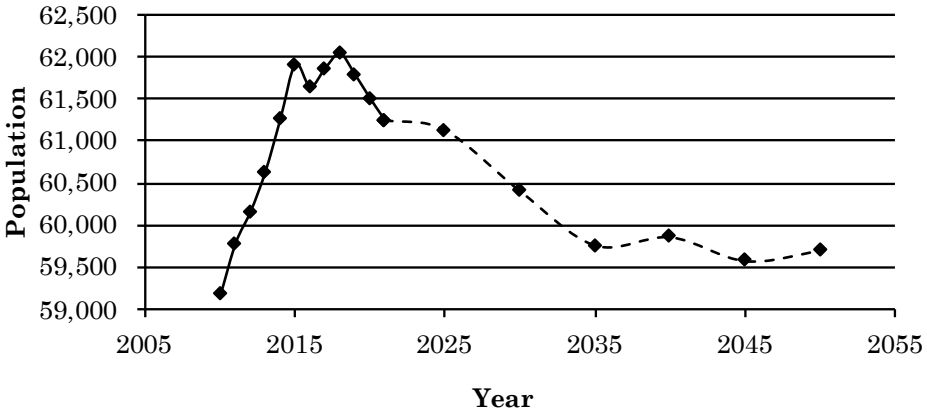
The rainfall normally occurs from November through March and varies with elevation. The lower elevations average 11 inches per year and the higher elevations average 14 inches per year. The San Diego region has been diligent in pursuing water conservation measures due to the low rainfall. This has led to reduced sewer flows per capita.

POPULATION

The estimate of current population within the District is 61,257 as of 2021 (provided by the San Diego Association of Governments, SANDAG). SANDAG also provided an estimate of population growth within the District from their Series 14 Forecast (2016 base year). SANDAG projects a 2050 population of 59,700; this is a 8.29% decrease from the Series 13 Forecast of 65,095



EQUIVALENT DWELLING UNITS

As of September 2022, there are 28,774 equivalent dwelling units (EDUs) within the District. These EDUs are split between the two cities, with 14,247 EDUs within the City of Carlsbad and 14,527 EDUs within the City of Encinitas.

Table 2-1 summarizes the number of existing EDUs by District drainage basin.

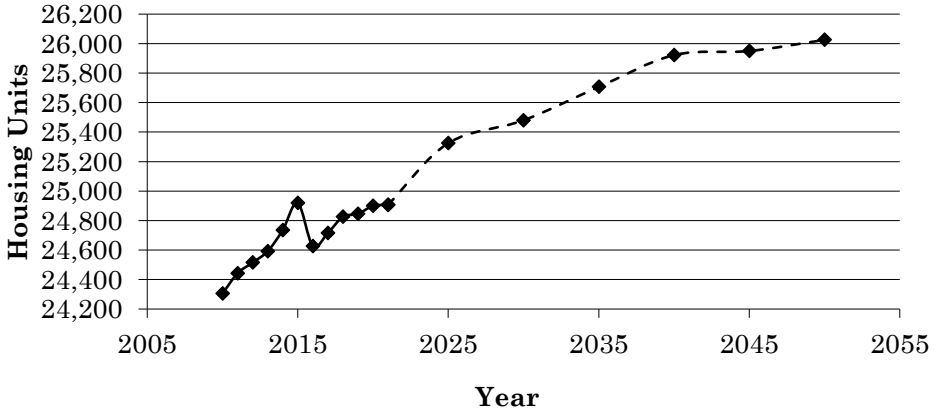
TABLE 2-1
LWD EDUs BY DRAINAGE BASIN

Drainage Basin	Connected EDUs[1]
1	2,384.8
2	539.54
3	1,265.35
4	1,295.88
5	1,091.78
6	2,039.65
7	1,995.98
8	4,346.01
9	5,708.59
10	3,502.41
11	4,580.1
TOTAL	**28,773.59[2]**

[1] As of September 2022 per LWD GIS Geodatabase. District database drainage basin distribution outdated.

[2] Drainage basin EDUs differ from District total due to 24 unassigned EDUs in the LWD GIS Geodatabase.

While SANDAG is projecting that the population within the District will decrease over time, their projections of housing units within the District shows a continuous increase as shown below. This would lead to a continued increase in residential EDUs, but a reduction in the number of people per residential EDU. This trend could be caused by multiple factors including a trend towards multi-family housing, ADUs within the District's service area, and the use of homes within the area as vacation homes and rental properties, which are not permanently occupied.



DRAINAGE BASINS

The District's 11 drainage basins are based on the District's piping system. Seven of these basins flow to the Leucadia Pump Station located on the District headquarters site. The flows from all 11 basins as well as flows from the City of Encinitas, are pumped from the Batiquitos Pump Station to the Encina Water Pollution Control Facility. The Batiquitos Pump Station is located at the northwest corner of the District on the east side of Coast Highway 101 just north of La Costa Avenue. The 11 drainage basins are described below, illustrated on Figure 2-1 and shown conceptually on the flow chart in Figure 2-2.

Drainage Basin #1

Drainage Basin #1 is located in the southwestern portion of the City of Encinitas, between the Pacific Ocean and the "Island Area" adjacent to Interstate 5. This basin consists of mixed residential and commercial customers, characteristic of the older downtown Encinitas area. Wastewater generated within this drainage basin is tributary to the Diana Pump Station, where it is pumped into the gravity line along North Vulcan Avenue, which is part of Drainage Basin #3. The North Vulcan Avenue gravity line flows north to the Batiquitos Pump Station.

Drainage Basin #2

Located in the northern portion of the City of Encinitas, Drainage Basin #2 provides wastewater collection to the Leucadia community. As with Drainage Basin #1, this basin consists of a mix of residential and commercial land uses. Collected wastewater is conveyed by gravity to the Avocado Pump Station, which lifts the wastewater into the gravity line along North Vulcan Avenue (Drainage Basin #3) and subsequently to the Batiquitos Pump Station. A small portion of this basin, located north of Grandview Street, does not flow to Avocado Pump Station, but rather gravity flows to North Coast Highway 101 by way of Moorgate Road.

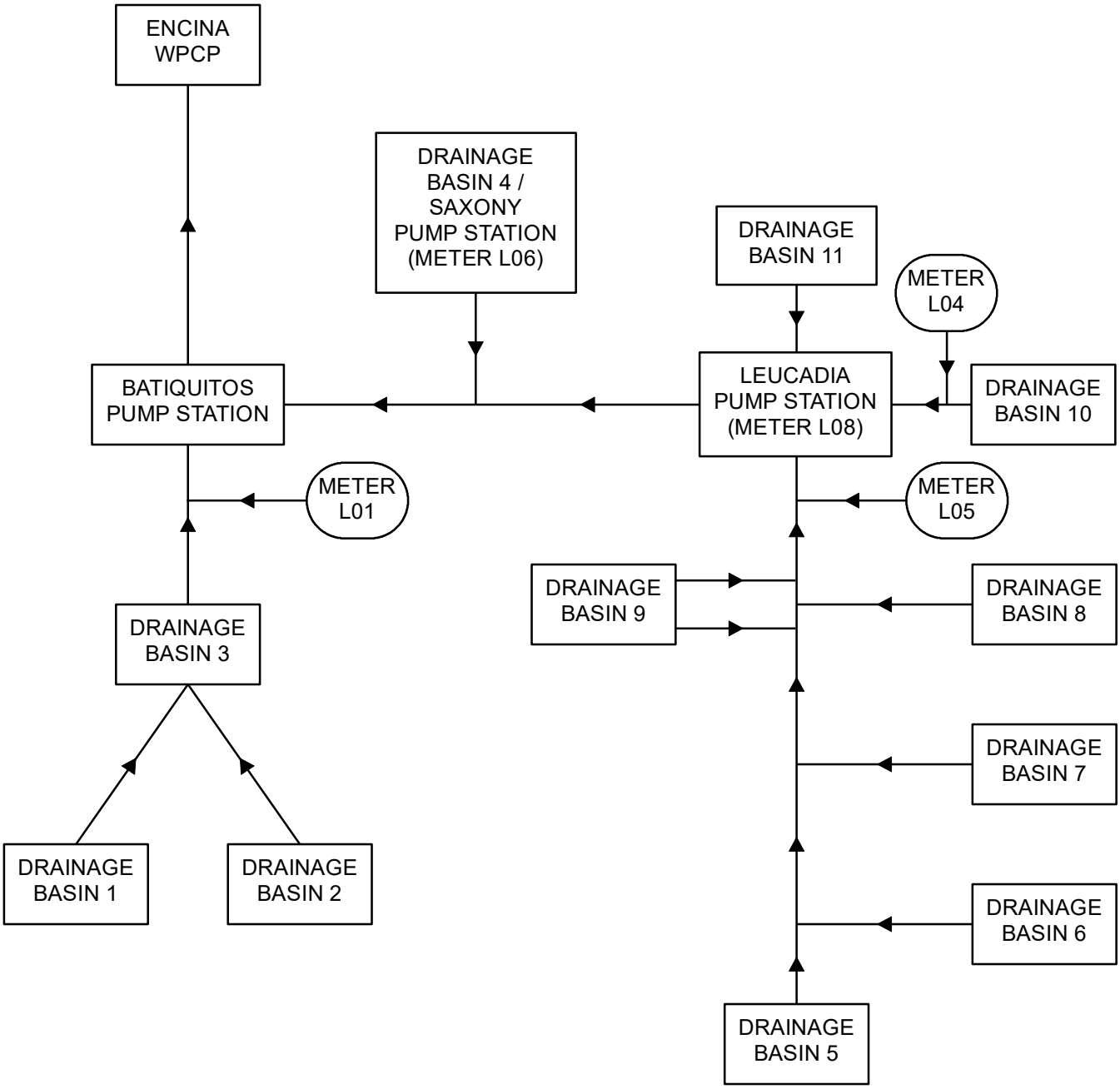


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FIGURE 2-2

COLLECTION SYSTEM FLOW SCHEMATIC

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

Drainage Basin #3

Drainage Basin #3 is located in the northern part of the Leucadia community, within the City of Encinitas between Old Highway 101 and Interstate 5. This basin is primarily comprised of residential customers, although there are commercial land uses located generally along North Vulcan and La Costa Avenue. Wastewater pumped into this basin from Drainage Basins #1 and #2, and locally collected gravity flows, are conveyed by gravity directly to the Batiquitos Pump Station.

Drainage Basin #4

Located within the City of Encinitas, Drainage Basin #4 is bounded by Interstate 5 on the west, the Batiquitos Lagoon on the north end, and the Encinitas City Limits on the east. This basin is characterized by a mixture of residential, commercial, and agricultural land uses. Wastewater generated within this basin is conveyed by gravity to the Saxony Pump Station. Saxony Pump Station lifts the wastewater into the Leucadia Pump Station force mains (L1 or L2) which discharge to the Batiquitos Influent Sewer in Coast Highway 101 and subsequently to the Batiquitos Pump Station.

Drainage Basin #5

Drainage Basin #5 is located in the City of Encinitas. It is in the extreme southern portion of the District, south of Encinitas Boulevard and along the El Camino Real alignment. The basin consists almost exclusively of residential land uses. The majority of the wastewater generated in this basin is conveyed by gravity to the El Camino Real gravity trunk sewer system. A southern sub-portion of the basin is tributary to the Encinitas Estates Pump Station, which in turn lifts the wastewater into the gravity collection system of the basin. The El Camino Real gravity trunk sewer discharges to the Leucadia Pump Station, which lifts wastewater to the Batiquitos Influent Sewer and Batiquitos Pump Station.

Drainage Basin #6

Drainage Basin #6 is located immediately north and east of Drainage Basin #5 in the City of Encinitas. It is bounded approximately by El Camino Real to the west, Mountain Vista Drive on the north, and Encinitas Boulevard on the south. The majority of the basin drains southward towards Encinitas Boulevard and is conveyed west in the Encinitas Boulevard gravity trunk system. An eastern sub-basin drains to the east along Encinitas Boulevard to the Village Park 5 Pump Station, which pumps the wastewater west into the Encinitas Boulevard gravity trunk system. The vast majority of Drainage Basin #6 consists of residential land uses, although a small commercial area exists along the western boundary of the basin adjacent to El Camino Real. Drainage Basin #6 wastewater combines with Drainage Basin #5 flows in this area, flowing north to the Leucadia Pump Station.

Drainage Basin #7

Drainage Basin #7 is located in the City of Encinitas north of Drainage Basin #6, bounded generally by El Camino Real to the west, Mountain Vista Drive on the south, and Willowspring Drive on the north. The basin is comprised almost exclusively of residential land uses. Wastewater generally flows by gravity along the Mountain Vista Drive alignment to the El Camino Real gravity trunk system. The eastern portion of the basin is conveyed east to the Village Park 7 Pump Station, where it is lifted to the west into the gravity collection system of the basin. Drainage Basin #7 flows combine with the Drainage Basin #5 and #6 flows in the El Camino Real gravity trunk system for transfer to the Leucadia Pump Station.

Drainage Basin #8

This drainage basin is located in the central and eastern portions of the District, generally along the Olivenhain Road alignment. Most of this basin is located in the City of Carlsbad; however, the portion south of Olivenhain Road is within the City of Encinitas. The basin is characteristically a large residential basin, with collected wastewater flowing by gravity from east to west into the El Camino Real gravity trunk system. Wastewater tributary to the Rancho Verde Pump Station, located in the eastern portion of the basin, is lifted into the gravity collection system of the basin. Drainage Basin #8 flows combine with the Drainage Basin #5, #6, and #7 flows in the El Camino Real gravity trunk system for transfer to the Leucadia Pump Station.

Drainage Basin #9

Drainage Basin #9 is located along the El Camino Real corridor, extending from Encinitas Boulevard on the south to La Costa Avenue on the north. The northern portion of the basin is in the City of Carlsbad and the southern portion is in the City of Encinitas. This basin is comprised of a mixture of commercial and residential land uses and contains the District's largest customer, Continuing Life Community. Wastewater from adjacent and upstream drainage basins is collected and conveyed to the Leucadia Pump Station by the El Camino Real gravity trunk system. Leucadia Pump Station then pumps to the Batiquitos Pump Station.

Drainage Basin #10

Drainage Basin #10 is located in the City of Carlsbad. It is in the northeastern portion of the District, bounded generally on the south by Calle Barcelona and on the north by San Marcos Creek. This basin primarily consists of residential land uses. Wastewater generated within this basin is conveyed by gravity to the Leucadia Pump Station.

Drainage Basin #11

Drainage Basin #11 is located in the City of Carlsbad, in the extreme northern portion of the District. It is bounded generally by San Marcos Creek on the south, El Camino Real to the west, and the District boundary on the north and east. This basin is characterized as a predominantly residential area with the La Costa Resort and Spa being the District's largest commercial customer in this basin. Wastewater from the basin is conveyed by gravity to the La Costa Pump Station.

GRAVITY PIPELINES

The District owns an extensive gravity piping system. Construction of the pipelines began in the 1960s and continues to the present day. The gravity system ranges in size from 6-inch diameter to 30-inch diameter. Table 2-2 provides a summary of the length of pipeline by size in the District. Table 2-3 provides a summary of the length of pipeline by material in the District. The District has a pipeline numbering system and this system has been adopted for use in this report.

TABLE 2-2
SUMMARY OF GRAVITY SEWER PIPING BY DIAMETER

Pipe Diameter, inch	Pipe Length, Feet
6	9,984
8	928,820
9	107
10	30,846
12	29,643
14	1,129
15	24,852
16	1,200
18	13,771
20	388
21	5,348
24	1,773
30	889
Unknown	3,909
TOTAL	**1,052,659**

Source: District Geodatabase June 2022.

TABLE 2-3
SUMMARY OF GRAVITY SEWER PIPING BY MATERIAL

Pipe Material	Pipe Length, Feet
ACP	2,013
CIP	263
DIP	295
HDPE	126
PRC [1]	5,638
PVC	596,253
VCP	442,332
PVC/VCP	689
RCP	38
Unknown	5,011
TOTAL	**1,052,658**

Source: District Geodatabase June 2022.
[1] May be PVC, VCP, or other

MANHOLES

There are approximately 4,748 manholes in the gravity sewer system and 393 cleanouts. The vast majority of the manholes are constructed of precast concrete sections. Approximately 268 of the District's manholes are lined with a protective coating to prevent concrete corrosion, 4,465 have not been lined, and the status has not been identified on 64 (primarily in Drainage Basins 8 and 9). Of the 268 lined manholes, 51 of them were installed 2006 and later; the District's 2006 revision to the Standard Spec added the requirement that all new manholes, existing manholes with new connections, and existing manholes with new manhole risers be lined.

The District's numbering sequence for manholes has been adopted for use in this report.

PUMP STATIONS

The District owns and operates 10 pump stations. When the Village Park 7 Pump Station Replacement Project is completed, the District will only have one Smith and Loveless packaged station (La Costa). Village Park 7 is currently being replaced with an E/One grinder pump station. All of the pump stations are described below. Table 2-4 contains a summary of the pump stations' operational characteristics; descriptions of each pump station and its service area are provided in the sections following.

TABLE 2-4
SUMMARY OF DISTRICT PUMP STATION CHARACTERISTICS

Pump Station	No. of Pumps	Capacity,[1] gpm	Motor Speed	Originally Built	Remarks
Avocado	2	300	Constant	1961	Station replaced in 2010 as submersible station.
Batiquitos	4	8,440	Variable	1974	Station improved and pumps replaced in 2013.
Diana	2	750	Constant	1963	Station replaced in 2010 as submersible station. Impellers replaced in 2020/2022.
Encinitas Estates	2	186	Constant	1974	Station replaced in 2022 as submersible station.
La Costa	2	2,200	Constant	1964	Pumps replaced in 2014.
Leucadia	5	4,000/720	Variable	1974	Station improved & pumps replaced in 2006 and in 2022.
Rancho Verde	2	185	Constant	1996	Station to be rehabilitated in 2023.
Saxony	2	900	Constant	1962	Rebuilt in 2016, except for force main.
Village Park 5	2	215	Constant	1974	Station replaced in 2017 as submersible station.
Village Park 7	4	15	Constant	1973	To be replaced with an E/One grinder pump station in 2023.

[1] Pump capacities represent nameplate information per pump.

Avocado Pump Station

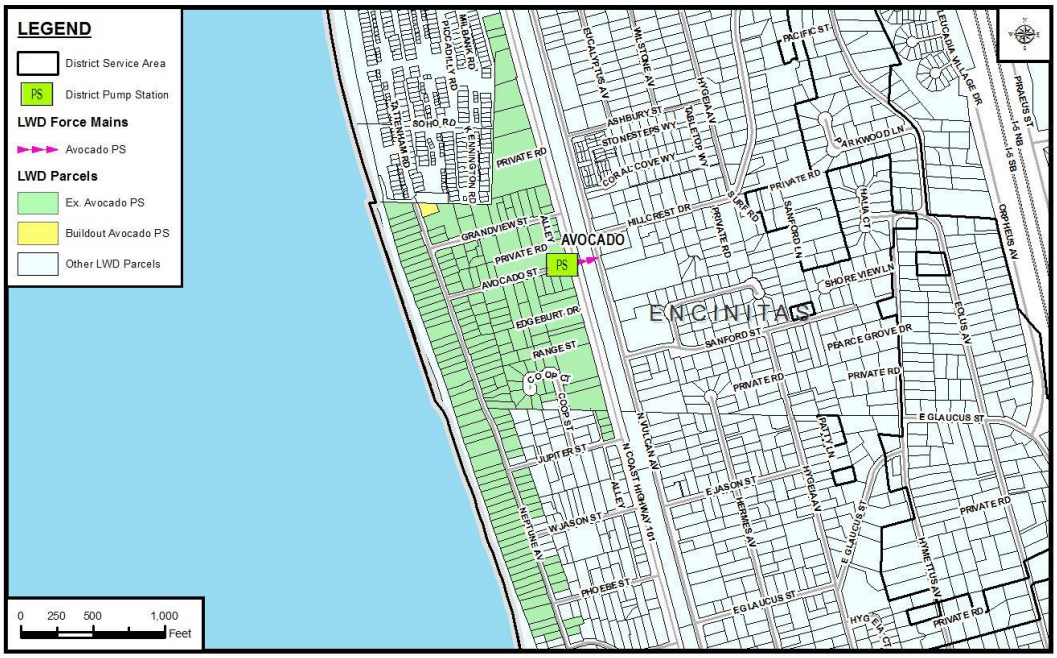


FIGURE 2-3. AVOCADO PUMP STATION BASIN

The Avocado Pump Station was built as a Smith and Loveless package pump station in 1961 and underwent a major upgrade in 1998. In 2010, the entire pump station was replaced as a submersible pump station with above ground controls and a PVC parallel force main was installed under Highway 101 and the railroad tracks. The pump station has two pumps, duty and standby, each of which is capable of pumping 300 gallons per minute. The motor on each of the pumps is a three-horsepower motor. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force mains. The pump station is located on Avocado Street approximately 75 feet west of Old Highway 101. There is no emergency generator permanently located at this station, it does, however, have electrical facilities to allow for use of a trailer-mounted generator.

Batiquitos Pump Station

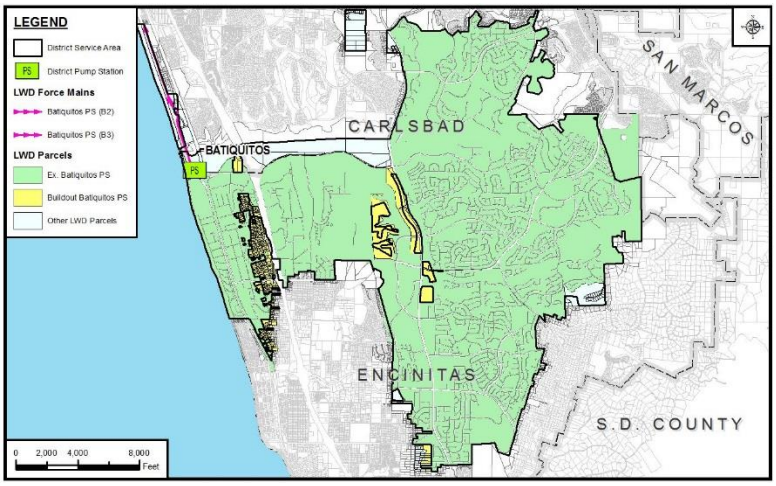


FIGURE 2-4. BATIQUITOS PUMP STATION BASIN

The Batiquitos Pump Station was built in 1974 and is the largest and most complex pump station in the District. The station is located on the southwest shore of the Batiquitos Lagoon adjacent to Coast Highway 101. The pump station conveys flows from both the District and the City of Encinitas. The District owns 77.86 percent of the pump station and the City of Encinitas owns 22.14 percent.

The pump station contains four pumps (lead, lag, and two standby) each of which can pump 8,440 gallons per minute (12.6 million gallons per day). Each of the pumps is equipped with a 250-horsepower motor controlled with a variable speed drive. During dry weather flows, the lead and lag pumps pump into one of the two pump station force mains. During wet weather flows, the lead and lag pumps pump into both force mains. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force mains. This station also has an emergency diesel generator that can run the station for approximately 20 hours before requiring refueling.

The pump station has a cast-in-place concrete wet well, dry well, and emergency overflow basin. Major upgrades were completed at the station in 1988, 1998, 2005, and 2013. The 2013 rehabilitation project cleaned grit and debris from the wet well, repaired the wet well linings, cored two openings to connect the east and west wet well sections, replaced three of four pumps (at the existing capacity), improved pump station bypass piping, and completed other miscellaneous improvements.

Diana Pump Station

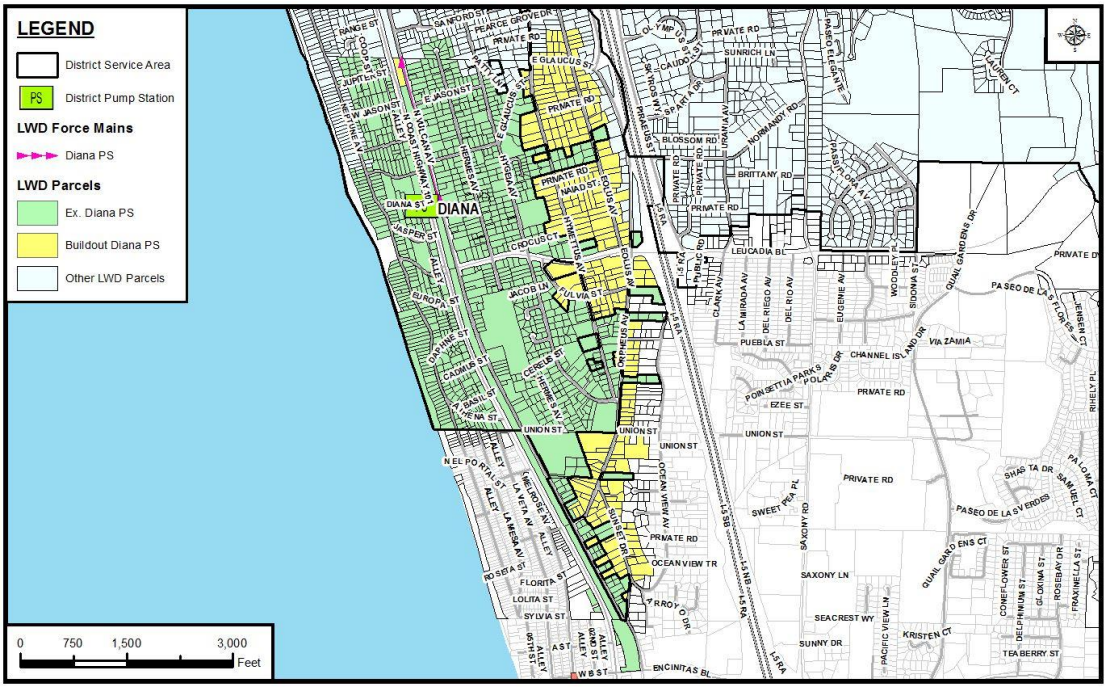


FIGURE 2-5. DIANA PUMP STATION BASIN

The Diana Pump Station was constructed in 1963 as a Smith and Loveless package station, and underwent a major upgrade in 1998. The pump station was replaced in 2010 as a submersible pump station with above ground controls. Also, the original AC force main was abandoned and replaced with PVC. Approximately 250 feet of the force main is paralleled (PVC) in a 30" steel casing under Highway 101 and the railroad tracks from the pump station to Vulcan Avenue. The pump station contains two pumps, duty and standby, each of which can pump 750 gallons per minute. The motor horsepower for each of the pumps is 15. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force mains. The station is located at 111 Diana Street west of Coast Highway 101. There is no emergency generator permanently located at this station, it does, however, have electrical facilities to allow for use of a trailer-mounted generator.

Encinitas Estates Pump Station

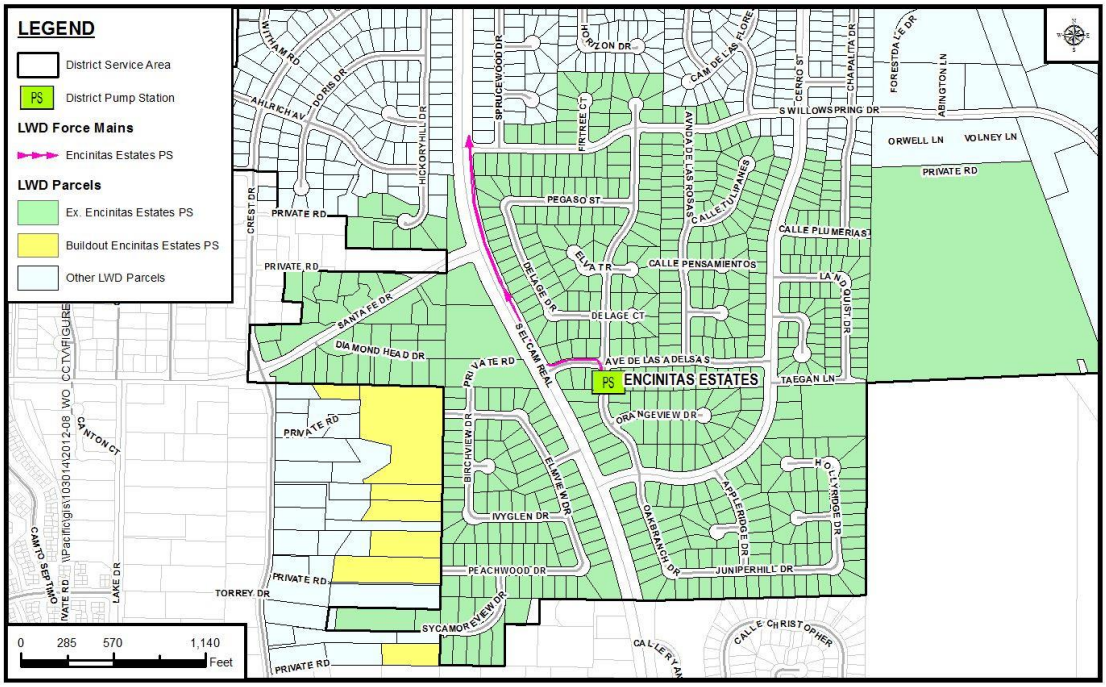


FIGURE 2-6. ENCINITAS ESTATES PUMP STATION BASIN

The Encinitas Estates Pump Station was built in 1974 and underwent a major upgrade in 1999. The packaged pump station was replaced with a submersible pump station in 2022. The station contains two pumps, duty and standby, each of which pumps 186 gallons per minute. The original AC force main was replaced in 2010 with a 6-inch PVC force main. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force main. There is also an emergency natural gas generator onsite which was replaced in 2022. The station is located at 2501 Oak Branch Drive in the southern portion of the District's service area.

La Costa Pump Station

FIGURE 2-7. LA COSTA PUMP STATION BASIN

The La Costa Pump Station is a Smith and Loveless package pump station that was built in 1964. The pump station was extensively rehabilitated in 2014. The pump station contains two pumps, duty and standby, each of which can pump 2,200 gallons per minute. Each of the pumps has a 30-horsepower motor. The pump station is located in an easement in the La Costa Resort and Spa adjacent to the main tennis court.

The La Costa Pump Station has a 12-inch PVC force main installed in 1998; a portion of the force main is 12-inch HDPE which was directionally drilled under San Marcos Creek. Bypass piping and valving is available at this pump station to bypass the pump station. The station also has an emergency diesel generator onsite that can run the station for approximately 17 hours.

Improvements to this pump station were completed in 2014. The improvements included recoating the MCC mounting channel, replacing the electrical switchboard and electrical transfer switch, installing bypass piping and valving for emergency pumping, installing a new uninterruptable power supply for control, and replacing both pumps and motors.

Leucadia Pump Station

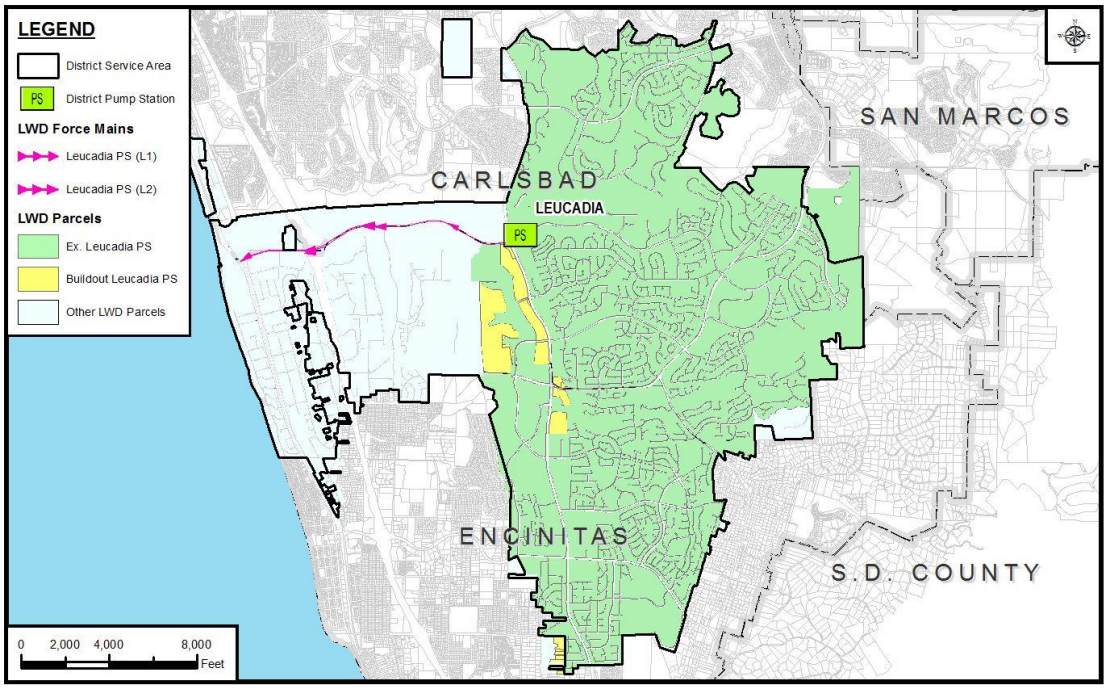


FIGURE 2-8. LEUCADIA PUMP STATION BASIN

The Leucadia Pump Station has a cast-in-place concrete wet well, dry well, and an above grade building. The pump station is located at the District headquarters and was built in 1974. This station collects the majority of the flow from the eastern end of the Batiquitos Lagoon and east at El Camino Real, serving the northern and southern portions of the District. The station pumps west along La Costa Avenue to the Batiquitos Influent Sewer. The pump station contains five pumps, three pumps rated for 4,000 gpm and two pumps rated for 720 gpm. In 2022, the pump station was improved and all pumps were replaced with dry pit submersible pumps. Additionally, an emergency overflow basin permanent pump was added. The ECO2 Super Oxygenation System was added for odor and force main corrosion control. The station has an emergency power diesel generator.

Rancho Verde Pump Station

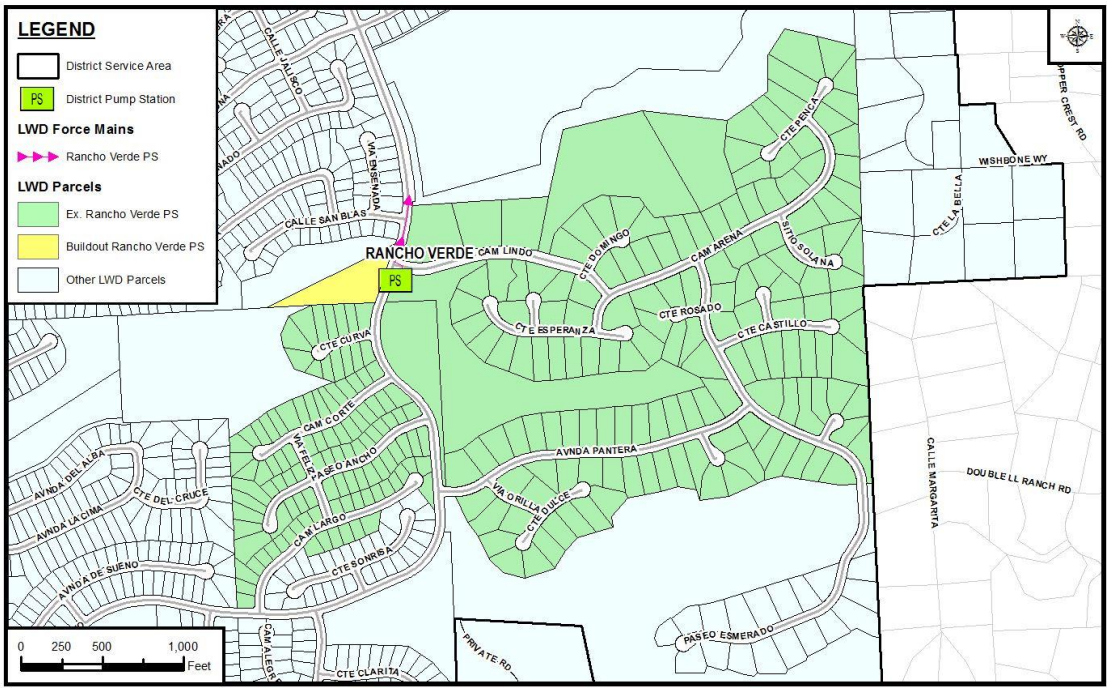


FIGURE 2-9. RANCHO VERDE PUMP STATION BASIN

Rancho Verde Pump Station was built in 1996. The pump station has a concrete wet well with submersible pumps. The pump station has two pumps, duty and standby, each of which has a capacity of 185 gallons per minute. Each of the pumps has a 5 horsepower motor. The station is located at the corner of Camino Lindo and Calle Acervo. The pumps are scheduled for replacement in 2024. There is no emergency generator permanently located at this station, it does, however, have electrical facilities to allow for use of a trailer-mounted generator.

Saxony Pump Station

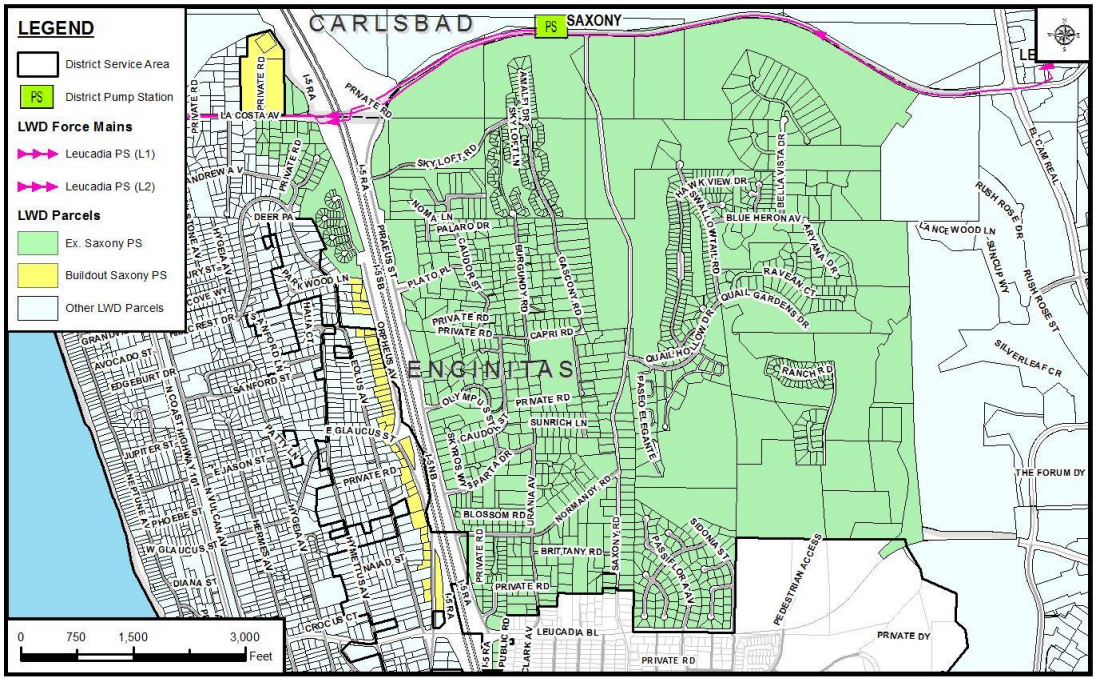


FIGURE 2-10. SAXONY PUMP STATION BASIN

The Saxony Pump Station was rebuilt in the year 1999 (including the onsite portion of ductile iron force main). This station has a concrete wet well with submersible pumps and an above ground structure. The pump station has two pumps, duty and standby, each of which has a capacity of 900 gallons per minute. The motor horsepower for each of the pumps is 40. In 2001, the offsite portion of the force main was replaced to connect to both Leucadia Pump Station force mains, L1 and L2. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force main. The station has an emergency diesel generator that can run the station for approximately 30 hours before requiring refueling. In 2016, a rehabilitation project was completed at the station which replaced both submersible pumps, completed some electrical upgrades, replaced valve vault piping, and other miscellaneous improvements. The Saxony Pump Station is located near the intersection of Saxony Avenue and La Costa Avenue adjacent to the Batiquitos Lagoon.

Village Park 5 Pump Station

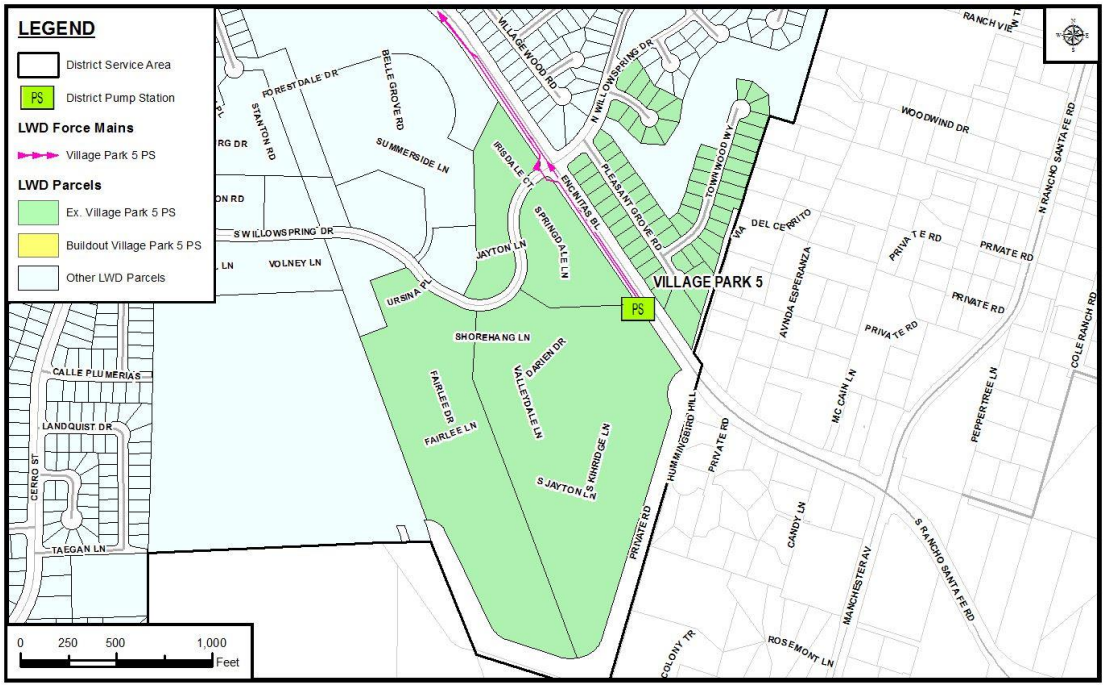


FIGURE 2-11. VILLAGE PARK 5 PUMP STATION BASIN

The Village Park #5 Pump Station was a Smith and Loveless package station built in 1974. In 2017, the entire station was replaced with a submersible station. The pump station contains two pumps, duty and standby, each of which has a capacity of 215 gallons per minute. Each of the pumps is driven by a 11-horsepower motor. The original PVC force main was replaced in 2008 with 6-inch PVC. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the pump station force main. There is also an emergency diesel generator onsite that can power the station for approximately 20 hours before requiring refueling. The station is located on Encinitas Boulevard south of the intersection of Willow Springs Drive.

Village Park 7 Pump Station

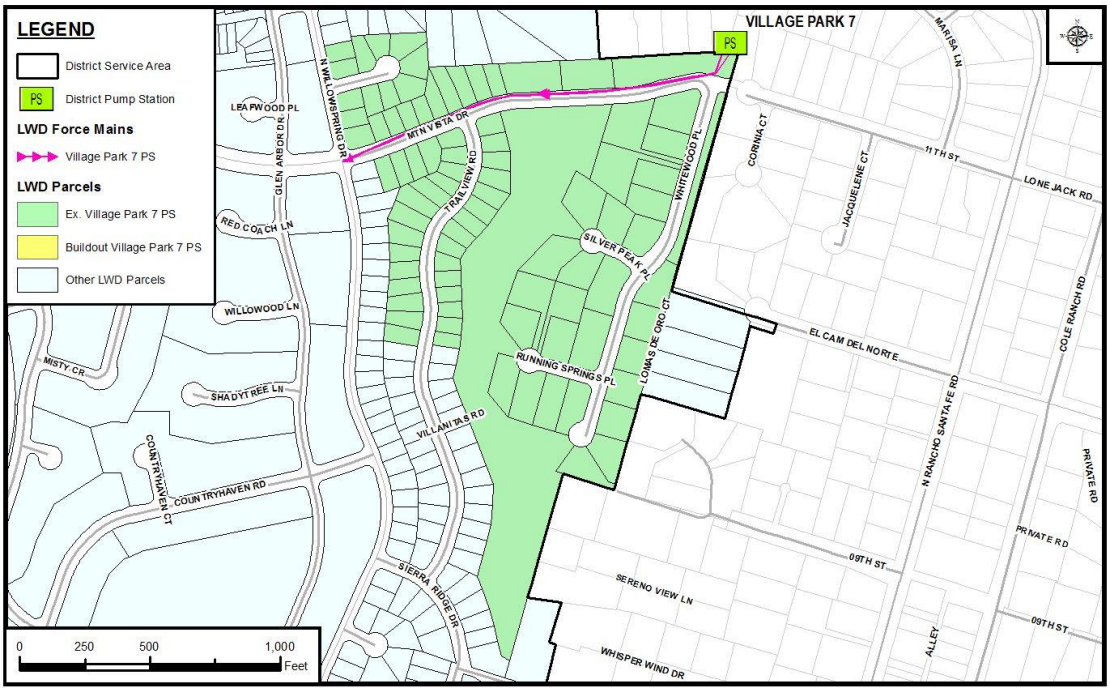


FIGURE 2-12. VILLAGE PARK 7 PUMP STATION BASIN

The Village Park #7 Pump Station is a Smith and Loveless package station built in 1973. The pump station is currently being replaced with an E/One grinder pump station which contains four pumps (two duty, two standby) each of which has a capacity of 10 gallons per minute. Each of the pumps is driven by a one horsepower motor. A new 2-inch HDPE force main will be installed. Bypass piping and valving is available at this pump station to bypass the pump station and utilize the 6-inch PVC force main installed in 2010. Village Park #7 Pump Station is located near the District's eastern boundary along Mountain Vista Drive. There is no emergency generator permanently located at this station, it does, however, have electrical facilities to allow for use of a trailer-mounted generator.

FORCE MAINS

Each of the District's 10 pump stations has a single or dual force main system. These force mains range in size from 4-inch diameter to 24-inch diameter. The force mains are constructed of cast iron (CIP), ductile iron (DIP), polyvinyl chloride (PVC), PVC-lined asbestos cement (AC), and high-density polyethylene (HDPE). Table 2-5 contains a summary of the force main characteristics.

TABLE 2-5
SUMMARY OF DISTRICT FORCE MAIN CHARACTERISTICS

Force Main	Diameter, inches	Length, feet	Material	Discharge Manhole	Year Installed
Avocado	6	275	Original: AC (PVC- lined) Parallel: PVC	03-0130	Original: 1962 (lined in 2010) Parallel: 2010
Batiquitos, B2 Batiquitos, B3	24 24	10,240 10,134	PVC DIP/PVC	LKT-1000 LKT-2000	1996/2011/2015 1988/'96/'11/'20
Diana	10	2,300	First 250' Paralleled PVC	03-0105	2010
Encinitas Estates	6	2,230	PVC	05-9080	2010
La Costa	10/12	1,127	CIP/PVC/HDPE*	10-0128	1965/98
Leucadia, L1 Leucadia, L2	24 24	13,989 14,000	DIP/PVC PVC/DIP/HDPE	03-0980 03-0992	1979/98/01/17 1996/01/03
Rancho Verde	4	460	PVC	08-12160	1997
Saxony**	8	80	DIP	L1/L2 FM	1999/2001
Village Park 5	6	1,945	PVC	06-0270	2008
Village Park 7	2	1,500	PVC	07-0330	2023

* The remaining CIP is a short section within the station
**Pumps into L1 or L2, whichever is operational.
Note – All force mains can be bypassed except for Rancho Verde.

JOINT CONVEYANCE FACILITIES

Table 2-6 provides a summary of the ownership of the joint conveyance facilities from the Batiquitos Pump Station to the Encina WPCF. There are five major elements to the joint conveyance system. These are the Batiquitos Influent sewer, the Batiquitos Pump Station, the Batiquitos Pump Station force mains, the Lanikai Gravity sewer and the Occidental sewer.

TABLE 2-6
JOINT CONVEYANCE FACILITIES OWNERSHIP

Facility	District Ownership, Percent
Batiquitos Influent Sewer	77.86
Batiquitos Pump Station - Pump Station - Generator - Force Mains (B2 and B3)	77.86
Lanikai Gravity Sewer (Railroad Crossing)	77.86
Occidental Line	40.3

Batiquitos Influent Sewer

Batiquitos Influent Sewer is owned 77.86 percent by the District and 22.14 percent by Encinitas. This sewer line conveys flows from Leucadia Pump Station, Moonlight Pump Station, and drainage basins 1, 2, and 3 to the Batiquitos Pump Station.

Batiquitos Pump Station

Batiquitos Pump Station (including the generator) is owned 77.86 percent by the District and 22.14 percent by Encinitas. The District is responsible for the operation and maintenance of the pump station and the District bills Encinitas for their share of costs.

Batiquitos Pump Station Force Mains

Batiquitos Pump Station has two force mains which leave the pump station site, traveling northward, within and adjacent to Highway 101. The force mains discharge into the Lanikai Gravity Sewer. Both are owned 77.86 percent by the District and 22.14 percent by Encinitas.

Lanikai Gravity Sewer

The 21-inch Lanikai Gravity Sewer flows west to east, starting at the discharge of the Batiquitos Pump Station force mains and connecting to the Occidental Sewer in Avenida Encinas. The Lanikai Gravity Sewer is jointly owned by Encinitas and the District. The District owns 77.86 percent and Encinitas owns 22.14 percent. In April 2020 as part of the larger Poinsettia Station Improvements Project, the steel casing of the existing gravity sewer under the railroad tracks was extended. Additionally, a parallel PVC gravity line was installed under the crossing. Three Predl-lined manholes serve as the junction structures for the parallel lines.

Occidental Sewer

The 39-inch, 42-inch, and 48-inch Occidental Sewer is jointly owned by the District, Carlsbad, and Encinitas. The District owns 40.3 percent of the facility, Carlsbad owns 40 percent, and Encinitas owns 19.7 percent of this facility. Carlsbad is responsible for inspecting and maintaining the Occidental Trunk Line and the associated manholes.

WASTEWATER TREATMENT AND DISPOSAL

The Leucadia Wastewater District relies on the Encina WPCF for the majority of its wastewater treatment and disposal needs. The District owns 17.55 percent of the Unit I liquid capacity at Encina WPCF and 16.42 percent of the Unit J outfall capacity and the Unit I solids capacity (based on the Encina Revised Basic Agreement). This equates to a treatment capacity of 7.11 million gallons per day.

The District also has a tertiary treatment plant north of the headquarters building called the Gafner Water Reclamation Plant (Gafner WRP). This treatment plant is all that remains of the original wastewater treatment facility for the District. Table 2-7 summarizes the District's treatment facilities.

TABLE 2-7
SUMMARY OF TREATMENT PLANT CAPACITY

Plant	Ownership, percent	Capacity
Gafner	100	1.0 mgd (tertiary only)
Encina	17.55 (Unit I liquid) 16.42 (Unit J outfall, Unit I solids)	7.11 mgd 7.11 mgd

Encina Water Pollution Control Facility (Encina WPCF)

The Encina WPCF is operated and administered by the Encina Wastewater Authority (EWA). The facility is operated under a joint powers agreement and is owned by six members including the District, Carlsbad, the City of Vista, the Vallecitos Water District, the Buena Sanitation District, and Encinitas. The current liquid capacity of the Encina WPCF is 40.51 mgd. The solids and outfall capacity are 43.31 mgd.

Effluent from the Encina WPCF is discharged to an ocean outfall directly west of the plant. A portion of secondary effluent is pumped back to the District for treatment to a tertiary level at the Gafner WRP for recycled water use.

Gafner Water Reclamation Plant (Gafner WRP)

The Gafner WRP was originally constructed in 1962 as a secondary wastewater treatment plant. When the District became a member agency of the Encina WPCF in 1972, the Encina WPCF became the major treatment plant for the District. In 1994, the Gafner WRP was upgraded to tertiary standards to provide recycled water for the South La Costa Golf Course. The current operation of the Gafner WRP consists of pumping back secondary effluent from the Encina WPCF and treating it to a tertiary level. This recycled water is then used for irrigation at the South La Costa Golf Course. The original primary and secondary treatment facilities were decommissioned in 1999 and demolished in 2003.

The District's headquarters and maintenance buildings are located adjacent to the Gafner WRP and were constructed in 2009.

CHAPTER 3

EXISTING EDU AND FLOW EVALUATION

This chapter presents an overview of the number of EDUs the District presently serves and also discusses historical flow patterns within the District. Chapter 4 describes the projection of buildout EDUs within the District and discusses buildout flows. All instances of "year" in this chapter refer to calendar year unless otherwise specified.

EXISTING EDUs

Table 3-1 provides a summary of existing EDUs as of October 2022 and also provides the existing EDU count at the time of the 2018 Asset Management Plan. The comparison is provided to show changes within each of the drainage basins.

In addition to growth within the District's sphere and boundary, the District has had areas over the years which have been detached from the District or, in one instance, served by a bordering sewer agency. Appendix A in the 2013 Asset Management Plan provided a detailed compilation of the agreements and detachments; Appendix A of this Master Plan provides updates and potential changes since 2013 (there were no changes 2013-2018).

TABLE 3-1
COMPARISON OF EXISTING EDUs
BY DRAINAGE BASIN

Description	2018 Master Plan Existing EDUs[1]	2023 Master Plan Existing EDUs[2]
Drainage Basin #1	2,326	2,384
Drainage Basin #2	526	540
Drainage Basin #3	1,154	1,265
Drainage Basin #4	1,268	1,296
Drainage Basin #5	1,086	1,092
Drainage Basin #6	2,048	2,040
Drainage Basin #7	1,996	1,996
Drainage Basin #8	4,325	4,346
Drainage Basin #9	5,706	5,709
Drainage Basin #10	3,492	3,502
Drainage Basin #11	4,550	4,580
SYSTEM TOTAL	**28,477**	**28,774[3]**

[1] As of August 2017 as provided by District staff.
[2] As of September 2022 per LWD GIS Geodatabase. District database drainage basin distribution outdated.
[3] Drainage basin EDUs differ from District total due to 24 unassigned EDUs in the LWD GIS Geodatabase.

HISTORIC FLOWS

The following section presents an analysis of historic average and peak flows.

Average Flows

Table 3-2 presents historic flows over the last ten years. Figure 3-1 shows historic flows dating back to 1997 (the detailed data to generate this figure can be found in Appendix B). The greatest yearly average flow occurs in Year 2005; it is 4.647 mgd. The highest monthly average flow over the period of historic data occurred in February 2005 and was 5.371 mgd. Based on District records, the number of EDUs connected to the District's collection system in February 2005 was 26,427, an average generation rate of 203 gallons per day per EDU.

It is also of interest to note that in 2014, the average yearly flow fell below 4 mgd for the first time since 1999. This trend has continued to the current year and there has been no average monthly flow greater than 4 mgd since 2015, excluding the January 2017 and April 2020 peak rain events.

Peak Flows

In addition to average flows, Table 3-2 and Figure 3-1 also present the District-only peak flows and rainfall measured in each month from January 2012 to June 2022. Additional historic flow data dating back to 1997 can be found in Appendix B. The following was observed from this data regarding peak flows:

- The dry weather peaks are much smaller than the wet weather peaks. The ratio of the hourly peak dry weather flow to the average daily flow is about 1.68 based on the monthly peak dry flow from days without a wet weather event. This value is lower than the 2018 Asset Management Plan value of 1.74. The decrease may be due to water conservation efforts in the last few years. If so, then this trend may continue. This may also be due to attenuation (flows less than capacity). Finally, this could be a reflection of more people staying at home in the 2020-2021 timeframe which would tend to equalize water use over a day.

- Measured peaks are greater in wet years than in dry years.

- The highest hourly peak from data back to 1997 was 13.215 mgd and occurred in January 2005. The ratio of this peak to average measured flow was 2.84. The next highest hourly peak was 11.833 mgd and occurred in April 2020. The ratio of this peak to average measured flow was 2.76.

- The 15-minute peak flow occurring during the one-hour peak was used to separate peak 15-minute wet weather flow from artificial peaks caused by maintenance operations.

- The highest 15-minute peak from all the data presented was in February 2005 and was 14.816 mgd. The ratio of this peak flow to the average measured flow was 3.19. The next highest 15-minute peak was in April 2020 and was 11.834 mgd. The ratio of this peak flow to the average measured flow was 2.76.

TABLE 3-2
HISTORIC FLOW DATA

Month/Year	Rainfall, Inches Per Month	Average Daily Flow, mgd	15 Minute Peak Flow, mgd	Ratio, 15 Min. to Avg.	1 Hour Peak Flow, mgd	Ratio, 1 Hour to Avg.
Jan-12	0.94	4.058	8.525	2.10	7.918	1.95
Feb-12	1.30	4.028	7.652	1.90	7.247	1.80
Mar-12	0.87	4.056	9.134	2.25	7.734	1.91
Apr-12	1.29	4.143	7.691	1.86	7.146	1.72
May-12	0.02	4.161	8.066	1.94	7.29	1.75
Jun-12	0.00	4.132	7.272	1.76	7.025	1.70
Jul-12	0.00	4.176	7.385	1.77	6.977	1.67
Aug-12	0.00	4.139	7.57	1.83	7.072	1.71
Sep-12	0.00	4.107	7.216	1.76	6.925	1.69
Oct-12	0.73	3.958	7.118	1.80	6.609	1.67
Nov-12	0.47	4.186	8.171	1.95	7.604	1.82
Dec-12	1.85	3.691	7.642	2.07	7.291	1.98
Yearly Average Daily Flow		**4.070**				
Jan-13	1.11	4.106	6.76	1.65	6.465	1.57
Feb-13	0.38	4.096	8.28	2.02	7.186	1.75
Mar-13	1.40	4.385	8.261	1.88	7.474	1.70
Apr-13	1.01	4.203	7.607	1.81	7.207	1.71
May-13	0.64	4.274	8.188	1.92	7.522	1.76
Jun-13	0.00	4.272	7.65	1.79	7.147	1.67
Jul-13	0.00	4.245	8.021	1.89	7.29	1.72
Aug-13	0.00	4.231	7.788	1.84	7.335	1.73
Sep-13	0.00	4.132	8.407	2.03	7.785	1.88
Oct-13	0.49	4.107	8.147	1.98	7.129	1.74
Nov-13	1.10	4.15	8.047	1.94	7.605	1.83
Dec-13	0.23	4.206	8.487	2.02	7.528	1.79
Yearly Average Daily Flow		**4.201**				
Jan-14	0.01	4.1	7.387	1.80	7.02	1.71
Feb-14	1.49	3.919	7.617	1.94	6.966	1.78
Mar-14	0.61	4.071	7.88	1.94	6.899	1.69
Apr-14	0.26	3.989	7.354	1.84	7.032	1.76
May-14	0.00	3.945	7.634	1.94	6.955	1.76
Jun-14	0.00	4.084	7.59	1.86	6.867	1.68
Jul-14	0.00	4.11	7.714	1.88	6.816	1.66

TABLE 3-2
HISTORIC FLOW DATA

Month/Year	Rainfall, Inches Per Month	Average Daily Flow, mgd	15 Minute Peak Flow, mgd	Ratio, 15 Min. to Avg.	1 Hour Peak Flow, mgd	Ratio, 1 Hour to Avg.
Aug-14	0.09	4.032	7.387	1.83	6.888	1.71
Sep-14	0.00	3.871	6.39	1.65	6.955	1.80
Oct-14	0.00	3.888	6.927	1.78	6.738	1.73
Nov-14	0.80	3.872	7.404	1.91	6.906	1.78
Dec-14	3.90	3.878	11.194	2.89	9.746	2.51
Yearly Average Daily Flow		**3.980**				
Jan-15	0.40	3.794	7.407	1.95	6.811	1.80
Feb-15	0.24	3.923	7.194	1.83	6.96	1.77
Mar-15	0.71	4.015	7.35	1.83	6.745	1.68
Apr-15	0.01	3.923	7.29	1.86	7.005	1.79
May-15	1.38	3.585	6.447	1.80	6.395	1.78
Jun-15	0.04	3.7	6.29	1.70	6.005	1.62
Jul-15	0.87	3.844	6.877	1.79	6.376	1.66
Aug-15	0.00	3.734	6.22	1.67	5.98	1.60
Sep-15	1.10	3.661	9.807	2.68	8.39	2.29
Oct-15	0.32	3.603	6.057	1.68	5.859	1.63
Nov-15	0.35	3.719	8.344	2.24	7.46	2.01
Dec-15	0.47	3.618	8.077	2.23	7.32	2.02
Yearly Average Daily Flow		**3.760**				
Jan-16	1.99	3.677	7.667	2.09	6.639	1.81
Feb-16	0.13	3.691	7.077	1.92	6.56	1.78
Mar-16	0.97	3.694	6.89	1.87	6.535	1.77
Apr-16	0.22	3.627	6.626	1.83	6.312	1.74
May-16	1.09	3.71	6.557	1.77	6.302	1.70
Jun-16	0.00	3.745	6.406	1.71	6.379	1.70
Jul-16	0.00	3.754	6.579	1.75	6.14	1.64
Aug-16	0.00	3.736	6.865	1.84	6.251	1.67
Sep-16	0.50	3.712	7.287	1.96	6.553	1.77
Oct-16	0.33	3.547	6.484	1.83	5.97	1.68
Nov-16	0.96	3.625	6.913	1.91	6.73	1.86
Dec-16	3.14	3.785	8.641	2.28	8.254	2.18
Yearly Average Daily Flow		**3.692**				

TABLE 3-2
HISTORIC FLOW DATA

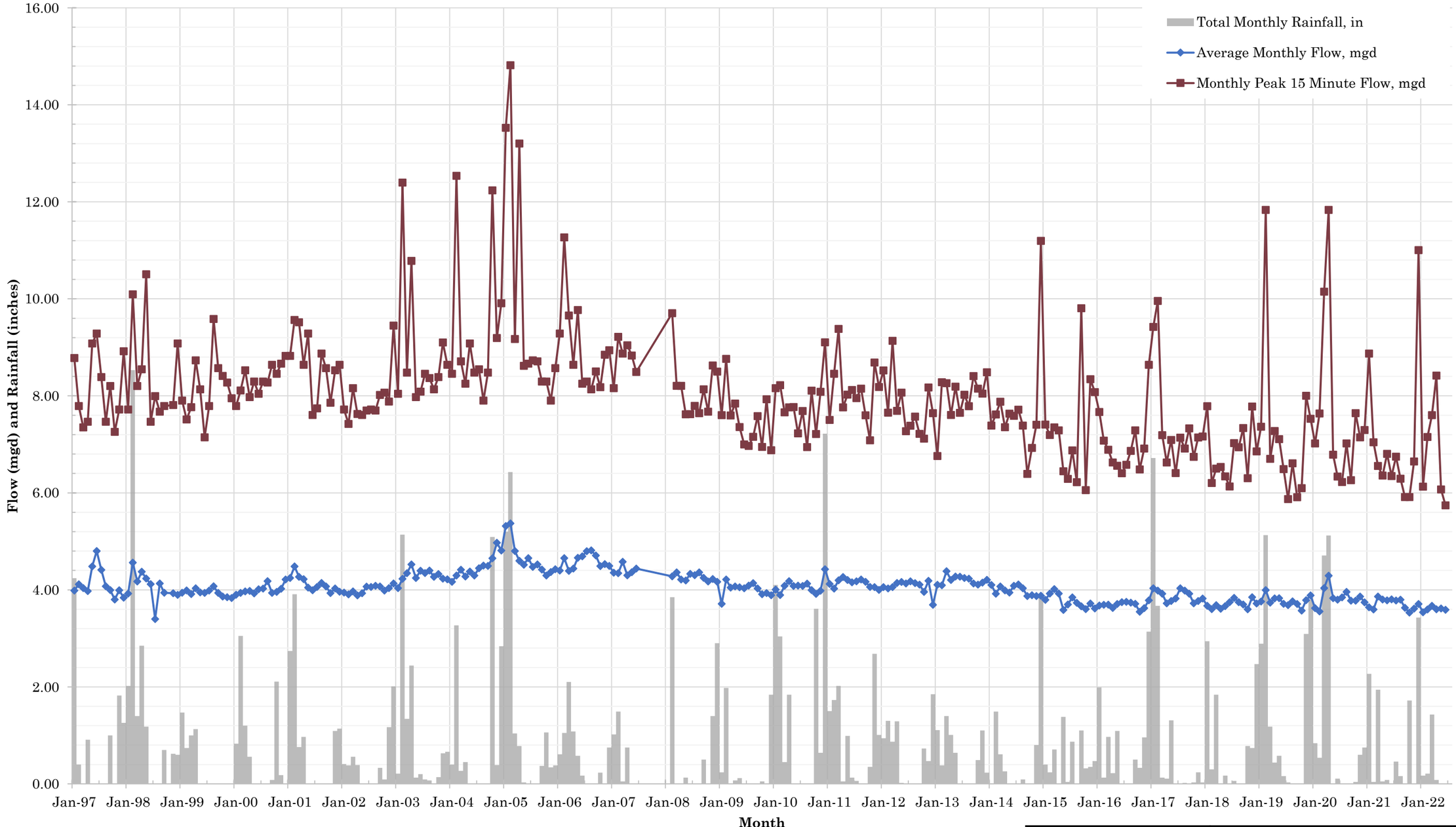
Month/Year	Rainfall, Inches Per Month	Average Daily Flow, mgd	15 Minute Peak Flow, mgd	Ratio, 15 Min. to Avg.	1 Hour Peak Flow, mgd	Ratio, 1 Hour to Avg.
Jan-17	6.72	4.032	9.421	2.34	8.752	2.17
Feb-17	3.67	3.984	9.956	2.50	9.94	2.49
Mar-17	0.13	3.92	7.189	1.83	6.799	1.73
Apr-17	0.11	3.723	6.628	1.78	6.278	1.69
May-17	1.31	3.769	7.091	1.88	6.477	1.72
Jun-17	0.01	3.820	6.407	1.68	6.188	1.62
Jul-17	0.00	3.879	7.137	1.84	6.416	1.65
Aug-17	0.02	3.848	6.915	1.80	6.074	1.58
Sep-17	0.01	3.728	7.328	1.97	6.513	1.75
Oct-17	0.03	3.616	6.744	1.87	6.051	1.67
Nov-17	0.24	3.778	7.143	1.89	6.873	1.82
Dec-17	0.03	3.678	7.163	1.95	6.490	1.76
Yearly Average Daily Flow		**3.815**				
Jan-18	2.94	3.670	7.786	2.12	6.360	1.73
Feb-18	0.30	3.602	6.205	1.72	6.103	1.69
Mar-18	1.84	3.685	6.501	1.76	6.391	1.73
Apr-18	0.00	3.611	6.534	1.81	6.189	1.71
May-18	0.17	3.664	6.340	1.73	6.250	1.71
Jun-18	0.00	3.745	6.133	1.64	5.880	1.57
Jul-18	0.06	3.834	7.025	1.83	6.416	1.67
Aug-18	0.00	3.745	6.942	1.85	6.280	1.68
Sep-18	0.00	3.699	7.335	1.98	6.539	1.77
Oct-18	0.78	3.599	6.302	1.75	5.923	1.65
Nov-18	0.74	3.850	7.780	2.02	7.110	1.85
Dec-18	2.47	3.720	6.855	1.84	6.504	1.75
Yearly Average Daily Flow		**3.702**				
Jan-19	2.89	3.761	7.364	1.96	6.567	1.75
Feb-19	5.13	3.997	11.833	2.96	9.641	2.41
Mar-19	1.18	3.735	6.701	1.79	6.323	1.69
Apr-19	0.44	3.825	7.276	1.90	6.957	1.82
May-19	0.58	3.827	7.109	1.86	6.426	1.68
Jun-19	0.16	3.713	6.490	1.75	6.126	1.65
Jul-19	0.03	3.685	5.871	1.59	5.793	1.57

TABLE 3-2
HISTORIC FLOW DATA

Month/Year	Rainfall, Inches Per Month	Average Daily Flow, mgd	15 Minute Peak Flow, mgd	Ratio, 15 Min. to Avg.	1 Hour Peak Flow, mgd	Ratio, 1 Hour to Avg.
Aug-19	0.00	3.765	6.610	1.76	5.990	1.59
Sep-19	0.00	3.709	5.911	1.59	5.882	1.59
Oct-19	0.00	3.571	6.098	1.71	6.061	1.70
Nov-19	3.09	3.789	8.001	2.11	7.792	2.06
Dec-19	3.80	3.887	7.526	1.94	7.226	1.86
Yearly Average Daily Flow		**3.772**				
Jan-20	0.84	3.622	7.020	1.94	6.422	1.77
Feb-20	0.54	3.554	7.636	2.15	7.163	2.02
Mar-20	4.71	4.036	10.148	2.51	9.254	2.29
Apr-20[1]	5.12	4.292	13.232	3.08	12.279	2.86
[1] April 2020 experienced significant flows that exceeded what the Batiquitos PS meter was set to read. Peak 15 Minute flows and 1 Hour flows are estimated based on the addition of LWD submeters L01, L04, L05, L06, and L07.						
May-20	0.00	3.828	6.788	1.77	6.310	1.65
Jun-20	0.11	3.797	6.337	1.67	6.129	1.61
Jul-20	0.00	3.847	6.223	1.62	6.002	1.56
Aug-20	0.00	3.958	7.019	1.77	6.310	1.59
Sep-20	0.00	3.778	6.261	1.66	6.091	1.61
Oct-20	0.04	3.777	7.642	2.02	6.721	1.78
Nov-20	0.60	3.863	7.145	1.85	6.646	1.72
Dec-20	0.75	3.743	7.293	1.95	6.073	1.62
Yearly Average Daily Flow		**3.841**				
Jan-21	2.27	3.642	8.870	2.44	7.108	1.95
Feb-21	0.04	3.597	7.042	1.96	6.380	1.77
Mar-21	1.94	3.862	6.555	1.70	6.236	1.61
Apr-21	0.05	3.801	6.356	1.67	6.199	1.63
May-21	0.08	3.785	6.805	1.80	6.126	1.62
Jun-21	0.01	3.804	6.346	1.67	6.051	1.59
Jul-21	0.46	3.780	6.745	1.78	6.223	1.65
Aug-21	0.16	3.799	6.291	1.66	5.906	1.55
Sep-21	0.00	3.629	5.912	1.63	5.732	1.58
Oct-21	1.72	3.532	5.915	1.67	5.729	1.62
Nov-21	0.00	3.613	6.646	1.84	6.408	1.77
Dec-21	3.43	3.710	11.004	2.97	8.007	2.16

TABLE 3-2
HISTORIC FLOW DATA

Month/Year	Rainfall, Inches Per Month	Average Daily Flow, mgd	15 Minute Peak Flow, mgd	Ratio, 15 Min. to Avg.	1 Hour Peak Flow, mgd	Ratio, 1 Hour to Avg.
Yearly Average Daily Flow		**3.713**				
Jan-22	0.17	3.539	6.129	1.73	5.846	1.65
Feb-22	0.21	3.595	7.152	1.99	6.216	1.73
Mar-22	1.43	3.672	7.602	2.07	6.835	1.86
Apr-22	0.08	3.599	8.417	2.34	7.445	2.07
May-22	0.00	3.616	6.070	1.68	5.701	1.58
Jun-22	0.00	3.591	5.743	1.60	5.630	1.57
Yearly Average Daily Flow		**3.602**				



Peak Monthly Flow is the 15 min peak during the highest one hour peak in the month
Flow data was obtained from ADS flow monitoring system. Data not available from July 2007-January 2008
Rainfall data was obtained from NCDC Oceanside Marina

LEUCADIA WASTEWATER DISTRICT

DEXTER WILSON ENGINEERING, INC.
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FIGURE 3-1

DISTRICT FLOWS FROM
JAN. 1997 TO JAN. 2022

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
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ANALYSIS OF EXISTING DISTRICT FLOWS

The District's standard flow rate is 215 gallons per day per EDU (gpd/EDU) as established in the 1994 Planning Study Update (April 1995, Parsons Engineering Science, Inc., Section 3, pg. 3-1.)

Table 3-3 presents the average gpd/EDU across the District in comparison to the gpd/EDU calculated in the previous Asset Management Planning efforts and highlights the decrease in generation rates from 2006 to 2021. The average gpd/EDU has plateaued since the last Asset Management Plan and may continue to decrease in the future based on statewide water conservation efforts.

TABLE 3-3
GENERATION RATE CALCULATIONS
2023 AMP GENERATION RATE, YEAR 2021

Parameter	Value
Average Flow, Year 2021	3.713 mgd
Total EDUs Connected, Year 2021	28,774 EDUs
Average Flow per EDU, Year 2021	129 gpd/EDU
2018 AMP, YEAR 2016	
Parameter	**Value**
Average Flow, Year 2016	3.692 mgd
Total EDUs Connected, Year 2016	28,477 EDUs
Average Flow per EDU, Year 2016	129 gpd/EDU
2012 AMP, YEAR 2011	
Parameter	**Value**
Average Flow, Year 2011	4.137 mgd
Total EDUs Connected, Year 2011	27,799 EDUs
Average Flow per EDU, Year 2011	149 gpd/EDU
2008 AMMP, YEAR 2006	
Parameter	**Value**
Average Flow, Year 2006	4.589 mgd
Total EDUs Connected, Year 2006	27,150 EDUs
Average Flow per EDU, Year 2006	169 gpd/EDU

Analysis of Infiltration Rates

This section presents a comparison of inflow and infiltration rates within the preceding 15 years. April 2020 is the month with the highest peak 15-minute flow. The average flow for April 2020 was 4.292 mgd. During April 2020 there were instances where the Batiquitos meter was at the maximum it was set to read and could not record any higher flow rate. In order to calculate the peak flow rate the peak flows from meters L01, L04, L05, L06, and L07 were added together. This estimation results in a higher peak than the meter's maximum capacity (13.6 mgd including Encinitas flows) but may not be accurate based on attenuation throughout the District's system.

Based on an estimated contribution during dry weather flow of 129 gallons per day per EDU, the estimated dry weather flow for this month would have been 3.709 mgd. Thus, in this peak monthly period, approximately 0.583 mgd of infiltration and inflow was received. The estimated inflow and infiltration rate over the peak hour was 6.098 mgd. The estimated 15 minute inflow and infiltration rate was 7.051 mgd. Acknowledging April 2020 was a significant rain event, efforts should continue to minimize inflow and infiltration as much as possible. Table 3-4 presents the calculation steps of the above.

In comparison, the inflow and infiltration rates evaluated in the 2018 AMP, using a significant rainfall event preceding the plan (2014) (Table 3-5) are lower. The phenomenon of higher inflow and infiltration rates at lower flows is common across collection systems.

TABLE 3-4
ANALYSIS OF WET WEATHER FLOW FOR APRIL 2020

Parameter	Value
Average Flow, April 2020	4.292 mgd
EDUs, April 2020	28,751 EDUs
Flow per EDU for April 2020	149 gpd/EDU
Sewage Flow Based on 129 gpd/EDU	3.709 mgd
Estimated Average Infiltration and Inflow for April 2020	*0.583 mgd*
Peak Measured 15-minute Flow, April 2020	13.232 mgd
Estimated Peak Dry Weather Flow Based on 129 gpd/EDU	6.181 mgd
Estimated Peak 15-minute Infiltration and Inflow	*7.051 mgd*
Peak Measured 1 Hour Flow	12.279 mgd
Estimated Peak 1 Hour Infiltration and Inflow	*6.098 mgd*

TABLE 3-5 ANALYSIS OF WET WEATHER FLOW FOR DECEMBER 2014	
Parameter	**Value**
Average Flow, December 2014	3.878 mgd
EDUs, December 2014	28,409 EDUs
Flow per EDU for December 2014	136 gpd/EDU
Sewage Flow Based on 129 gpd/EDU	3.665 mgd
Estimated Average Infiltration and Inflow for December 2014	*0.213 mgd*
Peak Measured 15-minute Flow, December 2014	11.194 mgd
Estimated Peak Dry Weather Flow Based on 129 gpd/EDU	6.377 mgd
Estimated Peak 15-minute Infiltration and Inflow	*4.817 mgd*
Peak Measured 1 Hour Flow (Maximum recorded Feb. 2017)	9.940 mgd
Estimated Peak 1 Hour Infiltration and Inflow	*3.563 mgd*

Analysis of Peak Factors

The trend of greater peaking at lower flows can also be seen in a comparison of peaking factors themselves. Table 3-6 and 3-7 present an analysis of peaking factors illustrating that, although flows have decreased, peaking factors have increased. The phenomenon of higher inflow and infiltration rates at lower flows is common across collection systems. The District has historically utilized peaking factors of 2.2 to 2.5 above the 215 gpd/EDU for design. As shown in Table 3-6, the peak wet weather event in April 2020 had a peaking factor of 1.99 (when assuming 215 gpd/EDU). What this tells us is if the design gpd/EDU is reduced, the design peaking factor should be increased, unless inflow and infiltration are further mitigated.

TABLE 3-6 ANALYSIS OF PEAK HOUR PEAKING FACTORS, 2020 RAIN EVENT	
Parameter	**Value**
Measured Peak 1 Hour Flow for April 2020[1]	12.279 mgd
Estimated April 2020 Flow Based on 129 gpd/EDU	3.709 mgd
Peaking Factor Based on 129 gpd/EDU	3.43
Estimated April 2020 Flow Based on 215 gpd/EDU	6.181 mgd
Peaking Factor Based on 215 gpd/EDU	1.99

[1] Flow is based on the addition of LWD submeters L01, L04, L05, L06, and L07.

TABLE 3-7
ANALYSIS OF PEAK HOUR PEAKING FACTORS,
2017 RAIN EVENT

Parameter	Value
Measured Peak 1 Hour Flow for February 2017	9.940 mgd
Estimated February 2017 Flow Based on 129 gpd/EDU	3.687 mgd
Peaking Factor Based on 129 gpd/EDU	2.70
Estimated February 2017 Flow Based on 215 gpd/EDU	6.146 mgd
Peaking Factor Based on 215 gpd/EDU	1.62

DISTRICT SUBMETERS

The District maintains five submeters throughout its boundary (previously seven). The locations of the submeters are shown on Figure 3-2.

The District has been tracking the monthly average flow through all of these submeters since July 2008 and on a monthly basis compares the total District flow based on the submeters to the total District flow based on Batiquitos Pump Station flows less Moonlight Beach Pump Station flows.

The previous Asset Management Plan recommended removing the L07 submeter due to accuracy concerns. L07 was located on the discharge piping of the La Costa Pump Station in close proximity to the pumps, and has been removed as of September 2021. L08 was installed on the discharge piping of the Leucadia Pump Station to replace L07. Flow data from L05 and L04 are subtracted from L08 to avoid overcounting of sewage flows.

In June 2021, L02 and L03 were also removed because they were in poor metering locations and believed to be inaccurate. Flows from these areas are now recorded through L05.

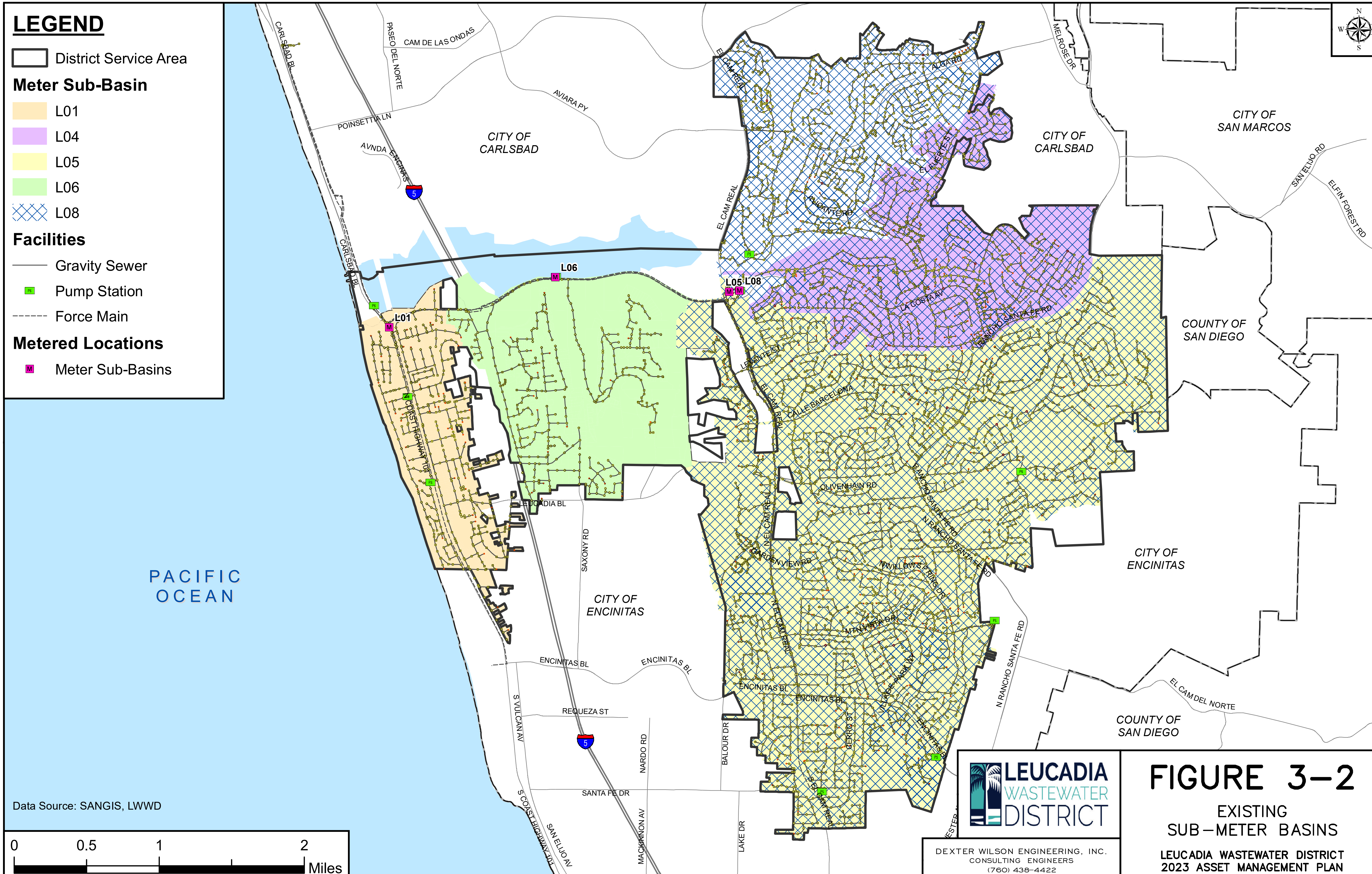

FIGURE 3-2

EXISTING SUB-METER BASINS

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
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SUBMETER TRENDS

Part of the work associated with development of this document included confirmation of the count of EDUs within each drainage basin and submeter basin. Table 3-8 provides a flow summary of each meter basin. The gpd/EDU projections are based on the EDU count as of October 2022 which provides a fair approximation of flow within each meter basin and fair comparison amongst the meter basins.

Figure 3-3 and Table 3-8 illustrate that the gpd/EDU for the area tributary to meters L01 and L04 exceed the current District average 129 gpd/EDU, while basins L05, L06, and L08 are less. As Figure 3-2 shows, the District's submeters are located at key points throughout the service area. Meter L01 serves the Old Leucadia area which is a mix of residential and commercial customers. This area is known to have a higher gpd/EDU because of the aging infrastructure present and root intrusion. The area is also historically prone to flooding/drainage issues during storm events. The submeter basin served by Meter L05 contains the L02 and L03 basins as well as several commercial customers on the west side of El Camino Real. Meter L04 and L08 are located on the Saxony and Leucadia Pump Station force main discharges, respectively.

TABLE 3-8
EXISTING SUBMETER GPD/EDU FLOW DATA FOR FY22

	District Flow	L01	L04	L05 [1]	L06 [2]	L08 [2,3]
	Bat - E1M	**Old Leucadia**	**La Costa East**	**N Grn Vly**	**Saxony**	**Leucadia PS**
Annual Average Flow, mgd	3.679	0.692	0.491	1.886	0.167	2.914
Existing EDUs	28,774	4,189	3,557	15,261	1,295	23,263
gpd/EDU	128	165	138	124	129	121
Peak Hour Flow, mgd	8.007	1.845	1.165	3.881	0.492	6.762
Peaking Factor	2.16	2.67	2.37	2.06	2.94	2.32
Peak 15 min Flow, mgd	11.004	1.948	1.473	3.932	1.077	7.090
Peaking Factor	2.97	2.81	3.00	2.08	6.43	2.43

1 L05 herein is a calculation based on ADS meter flow with no subtraction.
2 L06 and L08 are meters located on pump station discharge piping.
3 L08 herein is a calculation based on meter flow with no subtraction.

FIGURE 3-3
LEUCADIA WASTEWATER DISTRICT SUBMETER gpd/EDU FROM FY09-FY22

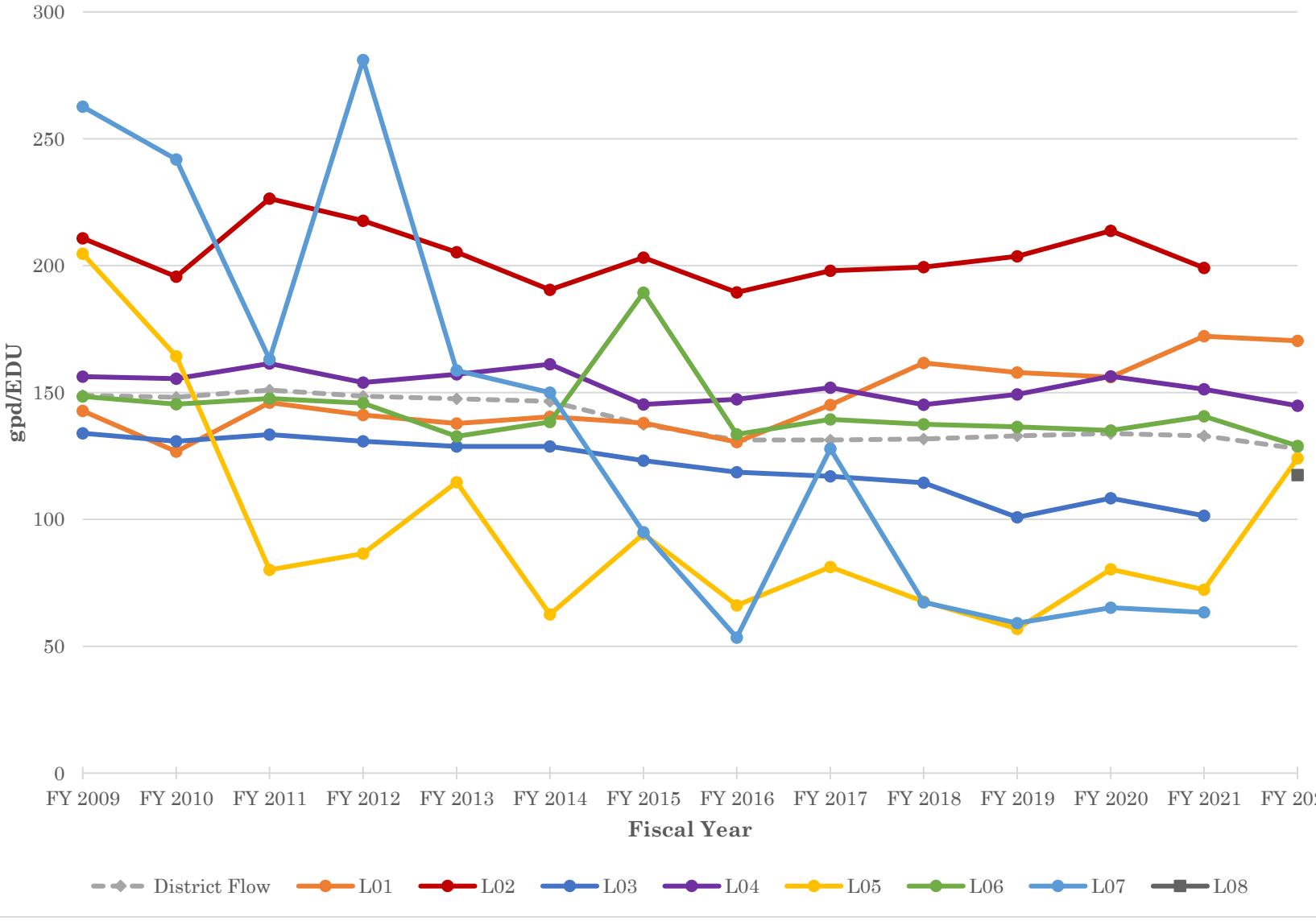

Table 3-8 also analyzes the peak flow for FY22. The peak flows since the last asset management plan was completed occurred in April 2020 which, as previously mentioned, was a significant rainfall event for the District as a whole. Table 3-9 analyzes the April 2020 event per District submeter.

Table 3-10 provides the average annual flow from 2008 through 2022 for each of the submeters and compares this to the difference between the District-wide flow as determined by Batiquitos Pump Station flows less Moonlight Beach Pump Station flows. Table 3-11 provides the annual average flow from 2017 through 2022 without meters L02 and L03 which were removed in June 2021. Detailed monthly flow information for each submeter can be found in Appendix C.

TABLE 3-9
EXISTING SUBMETER PEAK FLOW DATA FOR APRIL 2020 HIGH FLOW EVENT

	District Flow	L01	L02	L03	L04	L05[1]	L06[2]	L07[2]
	Bat - E1M	Old Leucadia	Rancho Santa Fe	Village Park	La Costa East	North Green Valley	Saxony	La Costa
Annual Average Flow, mgd	3.85	0.63	0.93	0.89	0.53	2.03	0.17	0.30
Peak Hour Flow, mgd	12.28[3]	2.06	2.59	2.87	1.93	4.77	1.14	2.37
Peaking Factor	3.19	3.26	2.79	3.21	3.64	2.35	6.56	7.91
Peak 15 min Flow, mgd	13.23[3]	2.19	2.64	3.03	2.11	4.86	1.64	2.43
Peaking Factor	3.44	3.47	2.84	3.39	3.98	2.39	9.46	8.11

[1] L05 herein is a calculation based on ADS meter flow without subtraction
[2] L06 and L07 are located on pump station discharge piping, so high peaking factors are a result of extended pump run times and possibly multiple pumps in operation.
[3] April 2020 experienced significant flows that exceeded what the Batiquitos PS meter was set to read. Peak 15 Minute flows and 1 Hour flows are based on the addition of LWD submeters L01, L04, L05, L06, and L07.

TABLE 3-10
MONTHLY AVERAGE SUBMETER FLOW DATA, 2008 - 2022

Flows in mgd	E1M	Bat	District Flow	L01	L02[2]	L03[2]	L04	L05[1]	L06	L07[3]	L08[3]	District Flow	% Difference b/w District Totals
Month/Year			Bat - E1M	Old Leucadia	Rancho Santa Fe	Village Park	La Costa East	N Grn Vly	Saxony	La Costa	Leucadia PS	Sum of L Meters	
Avg 7/08-6/09	1.11	5.20	4.09	0.55	0.88	1.07	0.51	0.52	0.18	1.16	-	4.87	19.12
Avg 7/09-6/10	1.03	5.11	4.08	0.49	0.82	1.05	0.51	0.42	0.18	1.07	-	4.45	9.12
Avg 7/10-6/11	1.04	5.22	4.18	0.57	0.96	1.07	0.53	0.20	0.18	0.72	-	4.24	1.48
Avg 7/11-6/12	1.07	5.19	4.12	0.55	0.92	1.05	0.51	0.22	0.18	1.25	-	4.68	13.71
Avg 7/12-6/13	1.06	5.16	4.10	0.54	0.87	1.04	0.52	0.29	0.16	0.71	-	4.14	0.85
Avg 7/13-6/14	1.02	5.10	4.08	0.55	0.81	1.04	0.53	0.16	0.17	0.67	-	3.94	-3.48
Avg 7/14-6/15	0.98	4.89	3.91	0.55	0.88	1.02	0.49	0.25	0.24	0.43	-	3.82	-2.07
Avg 7/15-6/16	0.95	4.70	3.75	0.52	0.83	0.98	0.50	0.17	0.17	0.25	-	3.35	-10.58
Avg 7/16-6/17	0.95	4.69	3.74	0.58	0.86	0.97	0.52	0.21	0.18	0.58	-	3.90	4.25
Avg 7/17-6/18	0.96	4.71	3.75	0.65	0.86	0.94	0.49	0.18	0.18	0.31	-	3.88	3.57
Avg 7/18-6/19	0.98	4.78	3.80	0.64	0.88	0.83	0.50	0.15	0.17	0.27	-	3.44	-9.52
Avg 7/19-6/20	0.95	4.80	3.85	0.63	0.93	0.89	0.53	0.21	0.17	0.30	-	3.67	-4.66
Avg 7/20-6/21	0.97	4.79	3.82	0.70	0.87	0.84	0.51	0.19	0.18	0.29	-	3.92	2.65
Avg 7/21-6/22	0.96	4.64	3.68	0.69	-	-	0.49	1.89	0.17	0.28	0.55	3.74	1.71
Standard Deviation	0.05	0.22	0.17	0.06	0.04	0.09	0.02	0.45	0.02	0.35	-	0.44	8.19

[1] L05 herein is a calculation based on ADS meter flow L05 minus L02 minus L03

[2] L02 and L03 meters removed in June 2021. No data available. L05 used to record flow data for these basins

[3] L08 meter installed with Leucadia Pump Station project in September 2021. L07 meter removed at this time. L08 herein is calculated based on ADS meter flow L08 minus L05 minus L04.

TABLE 3-11
MONTHLY AVERAGE SUBMETER FLOW DATA, 2017 – 2022

Flows in mgd	E1M	Bat	District Flow	L01	L04	L05[1]	L06	L07[2]	L08[2]	District Flow	% Difference b/w District Totals
Month/Year			Bat - E1M	Old Leucadia	La Costa East	N Grn Vly	Saxony	La Costa	Leucadia	Sum of L Meters	
Avg 7/17-6/18	0.96	4.71	3.75	0.65	0.49	1.92	0.18	0.31	-	3.49	-6.85
Avg 7/18-6/19	0.98	4.78	3.80	0.64	0.50	1.83	0.17	0.27	-	3.41	-10.19
Avg 7/19-6/20	0.95	4.80	3.85	0.63	0.53	2.03	0.17	0.30	-	3.67	-4.66
Avg 7/20-6/21	0.97	4.79	3.82	0.70	0.51	1.89	0.18	0.29	-	3.58	-6.44
Avg 7/21-6/22	0.96	4.64	3.68	0.69	0.49	1.89	0.17	0.28	0.55	3.74	1.71
Standard Deviation	0.01	0.07	0.07	0.03	0.02	0.08	0.01	0.01	-	1.47	4.39

[1] L05 herein is a calculation based on ADS meter flow without subtraction
[2] L08 meter installed with Leucadia Pump Station project in September 2021. L07 meter removed at this time. L08 herein is calculated based on ADS meter flow L08 minus L05 minus L04.

FLOW BY POPULATION

This section describes the process of determining a standardized gallon per capita per day value for residential use in the District. First, as summarized in Table 3-12, the District's EDUs were broken down by land use and meter basin to determine the total number of residential EDUs in each meter basin. This land use breakdown was then used to determine a gpd per capita (gpcd) based on FY22 flows for each meter basin, as well as the District as a whole as shown in Table 3-12. The typical sewage generation rate for the District was 51 gpcd for FY22. It should be noted that FY22 was a dry year, so factoring out wet weather flows does not significantly affect the numbers presented in Table 3-13.

TABLE 3-12
LAND USE AND EXISTING EDUS BY METER BASIN

Meter Basin	Residential EDUs	Commercial EDUs	Other EDUs	Meter Basin Total EDUs
L01	3,623.8	418.14	147.25	**4,189.19**
L04	3,547	0	10.75	**3,557.75**
L05	12,219.01	2,808.38	233.93	**15,261.32**
L06	1,231.1	51.73	13.05	**1,295.88**
L08	3,793.77	624.64	27.04	**4,445.45**
DISTRICT TOTAL	**24,414.68**	**3,902.89**	**432.02**	**28,749.59**

TABLE 3-13
FY22 SUBMETER GPD/PERSON

Meter Basin	gpd/EDU	Calculated Population [1]	Flow per person, gpcd
L01	165	9,092	66
L04	138	8,900	55
L05	124	30,658	49
L06	129	3,089	52
L08	125	49,076[2]	50
DISTRICT TOTAL	**128**	**61,257**	**51**

[1] Based on 2.5 people per residential EDU.
[2] Includes population from meter basin 4 and 5.

In recent years, the State of California has set future water conservation goals in order to address ongoing drought impacts. Senate Bill No. 1157, approved by the Governor on September 28, 2022, set a water usage goal of 55 gpcd until 2025, 47 gpcd starting in 2025 up until 2030, and then 42 gpcd from 2030 onwards. While the District average per capita wastewater flow use is under the current water use goal of 55 gpcd, some meter basins are higher. The meter basins that have the highest per capita flow, also have the highest flow per EDU, so that would indicate that I&I is most heavily affecting these basins. In general, as these water conservation requirements are implemented, wastewater flows will likely decrease. With decreased flows and increased strength, greater attention may be necessary toward mitigation of odors and corrosion, which may accompany the reduced flows.

FLOW AND EDU ANALYSIS CONCLUSIONS

1. Flows in this chapter are District-only.

2. During the peak wet weather event of April 2020 (peak one hour flow of 12.279 mgd), the District's collection system conveyed all flows without incident (as with the District's highest peak one hour flow event of 13.215 mgd in February 2005). Therefore, further study of the collection system to convey expected buildout flows is not needed at this time. Only if Encinitas or Carlsbad makes significant changes to their general plan, should the system be re-evaluated for buildout flows.

3. The current peak infiltration and inflow is near equal to the design infiltration and inflow. Existing District programs to control infiltration and inflow should be retained.

4. The 15-minute peak flow data is presented for information only. Due to attenuation of peaks in the sewer system, the one-hour peak flow data should be used for design evaluation and capacity calculations.

5. This analysis did not evaluate the ability to store flows and mitigate abnormally high peaks through the overflow basins at the Leucadia and Batiquitos Pump Stations. These overflow basins would allow the District to accommodate higher peaks than were analyzed and provide a factor of safety for the analyses in this report.

6. Updating the Existing EDU count in each Drainage Basin and sub-metered area of the District as new EDUs are connected would allow for monthly trend monitoring of the gpd/EDU wastewater generation rate of each sub-metered area.

7. District meter L07 has been replaced by meter L08 as recommended in the 2018 AMP. District meters L02 and L03 were also removed because they were in poor metering locations and believed to be inaccurate. Flows from L02 and L03 are recorded through L05.

CHAPTER 4

BUILDOUT EDU AND FLOW PROJECTIONS

The 2018 Asset Management Plan prepared a detailed parcel-by-parcel projection of Buildout (year 2050) EDUs anticipated in the District as shown by Drainage Basin in Table 4-1. These projections continue to be valid for this 2023 Asset Management Plan, as described further below.

TABLE 4-1
PROJECTION OF EXISTING AND BUILDOUT EDUs
BY DRAINAGE BASIN

Description	Land Use Agency	Existing EDUs	Buildout EDUs
Drainage Basin #1	Encinitas	2,384	2,801
Drainage Basin #2	Encinitas	541	629
Drainage Basin #3	Encinitas	1,263	1,822
Drainage Basin #4	Encinitas	1,298	1,648
Drainage Basin #5	Encinitas	1,092	1,252
Drainage Basin #6	Encinitas	2,038	2,187
Drainage Basin #7	Encinitas	1,987	2,115
Drainage Basin #8	Both	4,331	4,669
Drainage Basin #9	Both	5,721	6,201
Drainage Basin #10	Carlsbad	3,532	4,030
Drainage Basin #11	Carlsbad	4,572	4,620
SYSTEM TOTAL	**-**	**28,774**	**31,974**

Increase of 3,200 EDUs.

The 2018 Asset Management Plan projection of Buildout EDUs was based on SANDAG's Series 13 growth forecast for the City of Encinitas and the City of Carlsbad's 2015 General Plan. The detailed methodology for the EDU determination can be found in Chapter 4 and Appendix D of the 2018 Asset Management Plan.. Based on information provided by SANDAG staff in 2022, the SANDAG Series 14 growth forecast anticipates the addition of approximately 961 housing units between 2020 and 2050 within the District service area or sphere of influence. This increase in housing units is anticipated to occur concurrently with a population decline in the District during the same time frame. At 1.0 EDU per housing unit, the estimate of Buildout EDUs would leave 2,239 growth EDUs for non-residential EDUs and ADUs. As such, the 2018 projection of Existing and Buildouts EDUs shown in Table 4-1 is a conservative projection of growth within the District and will continue to be used for District planning.

Overall, achieving the 31,974 Buildout EDU count would require the addition of 64 EDUs/year (3,200 EDUs / 28 years). For comparison, over the last five years, the District growth rate has averaged 59.4 EDUs/year (28,774 – 28,477) / 5 years).

ANALYSIS OF DISTRICT FLOWS BY EDU

Table 4-2 provides Buildout flow projections for the District based on the Ultimate Buildout EDUs shown in Table 4-1. The flow projections have been prepared utilizing the District's average design flow generation factor of 215 gallons per day per EDU (gpd/EDU). (The District's design flow generation factor was established in the 1994 Planning Study Update, dated April 1995, Parsons Engineering Science, Inc., Section 3, pg. 3-1.) The flow projections have also been prepared utilizing the flow per EDU calculated using the most recent available data. This data includes the average daily flow for Year 2021 and the approximate number of EDUs connected to the system at that time.

As shown in Table 4-2, a design factor of 215 gallons per EDU per day leads to a Buildout District average flow of 6.87 mgd, which is greater than the Buildout average flow of 6.5 mgd estimated in the 1999 Wastewater Master Plan, and less than the 1985 Planning Study projection of 9.6 mgd. Based on 129 gpd/EDU obtained from the Year 2021 flow and EDU data, the Buildout District average flow would be 4.12 mgd. For the purposes of this 2023 AMP, the final Buildout Average Daily Flow for the District is projected to be 4.7 mgd (based on 133 gpd/EDU and a 10% safety factor); this is unchanged from the 2018 Asset Management Plan when detailed land use evaluations and EDU projections were prepared.

TABLE 4-2
2023 AMP COMPARISON OF FLOW PROJECTIONS, YEAR 2021

Parameter	Value
Average Flow, Year 2021	3.713 mgd
Total EDUs Connected, Year 2022	28,774 EDUs
Average Flow per EDU, Year 2021	129 gpd/EDU
Buildout EDUs	31,974 EDUs
Buildout Flow Based on 129 gpd/EDU	4.12 mgd average
Buildout Flow Based on 215 gpd/EDU	6.87 mgd average
District Buildout Planning Flow	**4.70 mgd average**

Tables 4-3 through 4-5 provide the same evaluation for historical comparison, highlighting the average gpd/EDU since 2008 has decreased from 169 to 149 to 129 gpd/EDU. The most recent flows in the 2021-2022 time frame are averaging approximately 128 gpd/EDU.

TABLE 4-3
2018 AMP COMPARISON OF FLOW PROJECTIONS, YEAR 2017

Parameter	Value
Average Flow, Year 2017	3.678 mgd
Total EDUs Connected, Year 2017	28,477 EDUs
Average Flow per EDU, Year 2017	129 gpd/EDU
Buildout EDUs	31,974 EDUs
Buildout Flow Based on 129 gpd/EDU	4.12 mgd average
Buildout Flow Based on 215 gpd/EDU	6.87 mgd average
District Buildout Planning Flow	4.70 mgd average[1]

[1] Based on 133 gpd/EDU plus 10 % safety factor.

TABLE 4-4
2013 AMP COMPARISON OF FLOW PROJECTIONS, YEAR 2011

Parameter	Value
Average Flow, Year 2011	4.137 mgd
Total EDUs Connected, Year 2011	27,799 EDUs
Average Flow per EDU, Year 2011	149 gpd/EDU
Buildout EDUs	30,045 EDUs
Buildout Flow Based on 149 gpd/EDU	4.48 mgd average
Buildout Flow Based on 215 gpd/EDU	6.46 mgd average

TABLE 4-5
2008 AMMP COMPARISON OF FLOW PROJECTIONS, YEAR 2006

Parameter	Value
Average Flow, Year 2006	4.589 mgd
Total EDUs Connected, Year 2006	27,150 EDUs
Average Flow per EDU, Year 2006	169 gpd/EDU
Buildout EDUs	30,045 EDUs
Buildout Flow Based on 169 gpd/EDU	5.08 mgd average
Buildout Flow Based on 215 gpd/EDU	6.46 mgd average

ANALYSIS OF DISTRICT FLOWS BY POPULATION

As discussed in Chapters 2 and 3, SANDAG is projecting the population within the District service area to decrease. Additionally, State-mandated water conservation efforts are anticipated to reduce the effective potable water use per person from 55 gallons per capita per day (gpcd) to 42 gpcd (a 24% reduction). This means, while EDUs will continue to increase, District flows may not increase at the same rate, and may decrease. Table 4-6 summarizes how a population-based analysis impacts Buildout flow projections.

TABLE 4-6
BUILDOUT FLOW PROJECTION USING POPULATION

Criteria	Existing		Buildout[1]	
	Residential	Non-Residential	Residential	Non-Residential
EDUs	24,414.68	4,334.91	25,375.68	6,573.91
Population	61,257	-	59,700	-
Generation Rate	51 gpcd	136 gpd/EDU[2]	39 gpcd	136 gpd/EDU[1]
Estimated Flow	3.124 mgd	0.589 mgd	2.328	0.894 mgd
TOTAL FLOW	**3.713 mgd**		**3.222 mgd**	

[1] Population decrease per Chapter 2, residential EDU increase of 961 EDUs, and a Non-Residential EDU increase of 2,239 EDUs.
[2] Existing Non-Residential gpd/EDU increased from LWD overall 129 gpd/EDU to match total 2021 flow of 3.713 mgd; held constant for Buildout Non-Residential gpd/EDU.

Per capita wastewater generation rate assumes 92% return to sewer. Assuming the sewer generation rate decreases proportionally with the water use from 51 gpcd to 39 gpcd and separating out residential and commercial flow, then at buildout the District would actually see a flow reduction to 3.222 mgd (in contrast to the 4.12 mgd average projected based on EDUs in Table 4-2). The District should continue monitoring the affect of potable water conservation requirements and population within the service area.

If it were assumed that the District population increased with the additional EDUs (counter to SANDAG's estimates), 2.5 people per residential EDU, and the same 39 gpcd listed above, the revised Buildout flow would be 3.37 mgd (25,375.68 x 2.5) x 39 x 10^{-6} x 0.894).

HYDRAULIC MODEL ANALYSIS OF BUILDOUT FLOWS

Long-term pipeline model capacity evaluations developed using InfoSewer modeling software are based on measured flows and attenuated pump flows to better model actual conditions. Based on these conditions, there are no pipeline capacity projects recommended.

Survey of Manhole Invert Elevations

The District should consider surveying some of the inverts of the existing manholes in its system to help verify the District's current sewer model. As previously noted, the District has pipelines that range in age from new to over 50 years old. A common issue for sewer systems that have been built over many decades is that the datum for surveying inverts changes over time leading to model inaccuracies. Surveying the manhole inverts will help validate the District's current model and improve the accuracy of future hydraulic modeling.

CHAPTER 5

GRAVITY SEWER PIPELINES AND MANHOLES

Gravity sewers and manholes represent the most substantial portion of the District's infrastructure from a quantity and value perspective. This chapter will provide a brief overview of how the District presently manages these asset classes and will provide short-term (5-Year) and long-term (20-Year) CIP recommendations and cost estimates.

ASSET MANAGEMENT OVERVIEW

Over the last fifteen years, the District has invested significant time and resources into identifying those facilities in most need of repair by systemically inspecting each gravity sewer pipeline utilizing closed circuit television (CCTV) equipment. More specifically, in recent years, the District has CCTV inspected nearly all of its gravity sewers at an inspection rate of the entire gravity system approximately every three years or less. Figure 5-1, from the District's Sewer System Management Plan (SSMP), illustrates this fact. CCTV not only provides a baseline visual condition assessment of the entire gravity system, it also is a key step in identifying the severity of issues within the system, enabling development of a comprehensive, prioritized list of known necessary future repairs, known as the Repair Priority List. Further discussion on this process is described later in this chapter.

MANHOLES

Manholes are addressed in the same manner as pipelines since they are visually inspected during hydrocleaning and CCTV activities. They are then added to the Repair Priority List following the process of the Rating Repair Lines/Manholes SOP.

LEGEND

- District Service Area
- District Sphere of Influence

CCTV Gravity Sewer Inspection by Date

- CCTV Inspection within last 3 Years
- 3 Years Since Last CCTV Inspection

PACIFIC OCEAN

CITY OF CARLSBAD

CITY OF ENCINITAS

CITY OF SAN MARCOS

COUNTY OF SAN DIEGO

PASEO DEL NORTE
CAM DE LAS ONDAS
AVIARA PY
AVNDA ENCINAS
CARLSBAD BL
EL CAM REAL
ALGA RD
MELROSE DR
EL CAMINO ST
LA COSTA AV
RANCHO SANTA FE RD
LEUCADIA BL
SAXONY RD
OLIVENHAIN RD
N RANCHO SANTA FE RD
WILLOW SPRINGS DR
MTN VIEW DR
ENCINITAS BL
REQUEZA ST
S VULCAN AV
NARDO RD
BALOUR DR
GERRO ST
SANTA FE DR
SAN ELIJO AV
MACKINNON AV
LAKE DR
SAN ELIJO RD
ELFIN FOREST RD
EL CAM DEL NORTE

Data Source: SANGIS, LWWD

0 0.5 1 2 Miles

LEUCADIA WASTEWATER DISTRICT

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 5-1

GRAVITY SEWER
CCTV COMPLETIONS
AS OF SEPTEMBER 2022

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
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ASSET MANAGEMENT PLAN IMPLEMENTATION TO DATE

Recent activities (since the 2018 Asset Management Plan) related to the District's management of gravity sewers can be classified into general activities (such as changes in operations) and specific activities (such as CIP projects), both of which are discussed below:

- The District continues to utilize its CCTV equipment for routine inspections, spot inspections, responding to customer requests, pre- and post-construction inspections, and monitoring areas of concern. A new CCTV truck was purchased in FY21 an easement crawler was purchased in FY22, and the CCTV van was upgraded in FY23.

- Gravity sewer pipeline and manhole projects continue to be implemented based on the prioritization in the Repair Priority List. More specifically, pipeline repair/replacements are grouped based on repair approach into either a lining project or dig-and-replace project, allowing for focused contractor efforts and increased economies of scale; this is discussed further in the latter portion of this chapter.

- In FY18, FY20, and FY22 smoke testing was conducted within the Avocado and Diana Pump Station basins. These older areas of Leucadia have been identified because they are known to have higher inflow and infiltration rates. The most recent efforts found 45 defects (primarily within private laterals and cleanouts), which were subsequently corrected by the District, or letters were sent to customers for them to address.

- In FY20, the District's portable flow meters (Echo meters) were relocated to strategic gravity sewer locations which are difficult to clean and CCTV inspect. In addition to monitoring capacity, the meters have assisted in determining whether the frequency of the resource-intensive cleaning and CCTV activities of these locations can be extended. These locations are also being further evaluated in terms of inflow and infiltration.

- In FY21, a mutual maintenance services and equipment agreement between the District and Olivenhain Municipal Water District (OMWD) was prepared. The agreement enables the District to have access to OMWD's hydraulic valve turning equipment services. These services will be utilized to exercise three large valves every six months at the major District pump stations. In return, the District will provide services to clean two of the OMWD's pump station wet wells.

- In FY22, the District began a regular schedule of inspecting food service establishments (FSEs) in the District, with 30 inspections performed in FY22. Figure 5-2 illustrates the FSE locations in the District.

- The District's Standard Specifications were updated FY22.

- The District developed the Lateral Replacement/Backflow Program to provide financial assistance to customers for the replacement of their private laterals. Lateral reimbursement letters are sent to customers when a CCTV inspection finds roots or other defects at their lateral connections. Additionally, letters are also sent when the District responds to calls about slow drains or private lateral spills at a residence. In FY22, there were 24 lateral reimbursements that totaled $55,000. In addition, there were 26 lateral reimbursement letters sent to customers. Implementation of this program reduces the private system impact on the District system due to roots and inflow.

- Gravity Sewer and Manhole CIP Projects completed between FY16-22 include:

    - FY22 Gravity Pipeline Rehabilitation Project
    - FY21 Gravity Pipeline Rehabilitation Project
    - FY20 Gravity Pipeline/Quebrada Project
    - FY19 La Costa Golf Course Gravity Pipeline Project
    - FY18 Gravity Pipeline Rehabilitation Project
    - FY17 Gravity Pipeline Rehabilitation Project

REPAIR PRIORITY LIST

As a follow-up to the field efforts to CCTV inspect the entire collection system, a corollary administrative and engineering effort must occur to turn the results of the CCTV inspections and manhole inspections into projects for immediate repair or projects for capital replacement. Staff has developed and refined a detailed standard operating procedure (SOP) to accomplish this task. The asset is rated on a scale from 0 to 4, where a "0" means the asset is defect free and a rating of "4" corresponds with imminent failure. In following that procedure, if a defect is found in a pipeline or manhole, the asset is placed on the District's Repair Priority List. Generally, assets rated as 4 are repaired/replaced immediately (through the use of the Miscellaneous Pipeline/Manhole Repair Account), whereas assets rated 3 are planned for repair in a future gravity pipeline capital rehabilitation project. Those assets rated as 2 or 1 remain on

LEGEND

- District Service Area
- District Sphere of Influence
- Food Service Establishment

Meter Sub-Basin

- L-01
- L-04
- L-05
- L-06
- L-08

PACIFIC OCEAN

CITY OF CARLSBAD

CITY OF ENCINITAS

CITY OF SAN MARCOS

COUNTY OF SAN DIEGO

CARLSBAD BL
PASEO DEL NORTE
CAM DE LAS ONDAS
POINSETTIA LN
AVIARA PY
AVNDA ENCINAS
EL CAM REAL
ALGA RD
MELROSE DR
ELFUERTE ST
ALICANTE RD
LA COSTA AV
RANCHO SANTA FE RD
LEUCADIA BL
SAXONY RD
N EL CAMINO REAL
OLIVENHAIN RD
GARDEN VIEW RD
N WILLOW SPRINGS DR
MTN VISTA DR
ENCINITAS BL
REQUEZA ST
S VULCAN AV
NARDO RD
BALOUR DR
CERRO ST
VILLAGE PARK WY
S EL CAMINO REAL
SANTA FE DR
S COAST HIGHWAY 101
SAN ELIJO AV
MACKINNON AV
LAKE DR
N RANCHO SANTA FE RD
EL CAM DEL NORTE
SAN ELIJO RD
ELFIN FOREST RD
LEUCADIA WASTEWATER DISTRICT

Data Source: SANGIS, LWWD

0 0.5 1 2 Miles

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 5-2

FOOD SERVICE ESTABLISHMENTS

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
Document Path: \\artic\GIS\10322\Report Figures\2nd_Submittal\Figure_5-2_FoodEstab.mxd
Date Saved: 3/21/2023 1:57:28 PM

the Repair Priority List allowing the District to monitor those assets. The District may also decide to repair or rehabilitate the grade 1 and 2 defects in the future.

Repair Priority List Completions

Repair Priority List and Miscellaneous Line Repair completions from the previous fiscal years are summarized in Table 5-1 below, with the detailed list of completions in Appendix E. These completions occurred as part of the CIP projects described above or under the Miscellaneous Line Repair Activities.

TABLE 5-1
REPAIR PRIORITY LIST AND
MISCELLANEOUS LINE REPAIR COMPLETIONS
SUMMARY BY FISCAL YEAR

Fiscal Year	Feet of Pipeline Lined	Feet of Pipeline Replaced	Manholes
2015	5,392	1,477	23 Lined 3 Rehab 5 New
2016	1,548	41	24 Lined 1 Rehab 4 New
2017	1,989	0	0
2018	4,955	0	13 Lined 7 Rehab
2019	0	0	0
2020	289	1,117	0
2021	6,627	0	3 Lined
2022	0	0	8 Lined 4 New
EIGHT YEAR TOTAL		**23,435 feet of PIPELINES**	**82 MANHOLES**

Repair Priority List Open Items

The Repair Priority List as of August 2022 is provided in Appendix F. Table 5-2 below summarizes the length of pipeline presently on the Repair Priority List organized by severity and age. This list represents 5.16% of the District system by linear foot. Additionally, there are 42 manholes with a Grade 3 rating, 64 manholes with a Grade 2 rating, and 20 manholes with Grade 1 rating presently on the Repair Priority List. Figure 5-3 displays the location of pipelines and manholes on the Repair Priority List, the severity, and whether or not it was included on the 2018 Master Plan Exhibit and whether its severity has changed since that time.

TABLE 5-2
SUMMARY OF CURRENT REPAIR PRIORITY LIST
BY PIPELINE SEVERITY AND AGE

Pipe Severity	Length of Pipe (in feet) by Age (in years)						Total Feet
	10-19 Years	20-29 Years	30-39 Years	40-49 Years	> 50 Years	Unknown	
1	0	0	195	2,192	5,986	6,189	14,562
2	0	0	1,139	7,882	17,552	0	26,573
3	60	0	405	2,923	8,134	0	11,522
TOTAL FEET	**60**	**0**	**1,739**	**12,997**	**31,672**	**6,189**	**52,697**

As of August 2022

The lining cost assumes a top hat installation for every 40 feet lined and a spot repair for approximately every 140 feet, and excludes manholes.

Historically, projects completed using the Miscellaneous Pipeline/Manhole Repair Account have consisted of spot repairs, while capital projects are a combination of spot repairs and lining of the entire line or replacement, if warranted. Use of the Miscellaneous Pipeline/Manhole Repair Account is typically reserved for emergency repairs (Severity of 4) and those of Severity of 3 are addressed in a capital project. In some cases, spot repairs are necessary in order to line a pipeline.


LEGEND
District Service Area
District Sphere of Influence
Gravity Sewer Pipe Age (2022)
0 - 9 years
10 - 19 years
20 - 29 years
30 - 39 years
40 - 49 years
50 - 59 years
60 - 69 years
Unknown
Pipe/MH Priority (August 2022)
#4 Grade 4 Severity (None)
#3 Grade 3 Severity
#2 Grade 2 Severity
#1 Grade 1 Severity
#X New 2022 Exhibit Repair Priority
#X On 2017 Exhibit (Same Severity)
#X On 2017 Exhibit (Greater Severity)
#X On 2017 Exhibit (Less Severity)
PACIFIC OCEAN
CITY OF CARLSBAD
CITY OF CARLSBAD
CITY OF SAN MARCOS
COUNTY OF SAN DIEGO
CITY OF ENCINITAS
CITY OF ENCINITAS
COUNTY OF SAN DIEGO
COUNTY OF SAN DIEGO
0 750 1,500 3,000 Feet
LEUCADIA WASTEWATER DISTRICT
DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
2234 FARADAY AVENUE
CARLSBAD, CA 92008
(760) 438-4422
FIGURE 5-3
REPAIR PRIORITY LIST
AS OF NOVEMBER 2022
LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

Repair Priority List Future Maintenance and Implementation Considerations

In parallel with future operation and maintenance activities (e.g. smoke testing, root foaming, and food service establishment inspections), hydrocleaning and CCTV inspection of the gravity sewers and manholes will remain the District's primary approach toward condition assessment of these asset classes. As the Repair Priority List is updated with the CCTV inspections and developed into CIP projects, there are several items to consider.

1. When the facility is added to the Repair Priority List, District staff should identify whether or not a repair has previously occurred on the pipeline.

2. The District could consider maintaining a layer within GIS for the current Repair Priority List (as shown in Figure 5-7) and Completed Repairs. Alternatively, rather than maintaining a separate GIS layer, fields could be added to Inframap to be populated so that field crews are aware of the status.

3. The Repair Priority List and Miscellaneous Repair Completions could be retained in a single database for easy importation to GIS or Inframap at a future date.

4. When lining a pipeline in an area with chronic root issues, the lateral connections could be addressed if the CCTV Inspection indicates the lateral connection is the root source, via either a top hat, T-liner, or other means. We recommend this to be the District's standard practice when lining or replacing in areas of known root intrusion.

5. When possible, spot repairs of pipelines should be addressed by lining the entire pipe segment, particularly on pipes greater than 40 years in age.

6. Consider revising the CCTV and/or Hydrocleaning SOPs to include notations as to whether a manhole is lined or not. Alternatively, revise the Inframap form to require completion of the lining field prior to closing the work order.

7. Consider revising the CCTV and/or Hydrocleaning SOPs to include notations as to whether an inflow dome is present on a manhole. Alternatively, revise the Inframap form to require completion of the inflow dome field prior to closing the work order.

8. Consider increasing the quality of manhole inspections by maximizing the use of camera equipment to photograph and videotape manholes. As with the gravity sewer pipelines, photos and videos taken during manhole condition evaluations could be organized with a GIS-centric software system. This would allow quick access to prior inspections of the manhole for comparison of condition degradation.

9. Aggregate manhole linings into a stand-alone project to take advantage of economies of scale.

5-YEAR CIP

The following section summarizes projects recommended for inclusion in the District's 5-Year CIP. All costs are planning costs which include both design and construction unless noted otherwise. Note that there are no capacity-based projects in the 5-year or 20-year CIP.

FY 2023 Gravity Pipeline Rehabilitation Project

This project consists of lining 34 gravity sewer segments (approximately 8361 feet) with CIPP lining. Additionally, two manholes will be installed to replace failed clean-outs or stubs. The project is budgeted at $682,000.

Annual Gravity Pipeline and Manhole Rehabilitation Projects

Continuation of the Repair Priority List implementation is intended to follow the alternating approach of lining in one year and dig-and-replace the next. Based on the historical defects found, $790,000 per year is budgeted. Dollar amounts may be reallocated to another year's project as needed. Additionally, one year's project may be solely for manhole rehabilitation.

Potential Programmatic Replacement Program. While not included in the 5-year CIP, should all Grade 3 and Grade 4 defects be addressed, and should adequate funding be available, the District could consider strategic, programmatic replacement/lining of areas of the District with aging infrastructure and known inflow and infiltration. The prior AMP provides additional discussion on this approach. In summary, this could occur as follows:

a. Repair all Grade 2 and Grade 1 defects.
b. Replacement (line or dig and replace) aged VCP with areas of higher inflow and infiltration (Drainage Basins 1, 2, and 3), and
c. Replacement (line or dig and replace) aged VCP in Drainage Basis 11.

Miscellaneous Line Repair (Pipelines and Manholes)

The District has historically had a Miscellaneous Line Repair budget line item within the budget. We would recommend continuing to include the Miscellaneous Line Repair at the current amount of $205,000 per year.

Headquarters Buildings

The District headquarters buildings (administrative, vactor building, etc.) are relatively new. While no projects have been identified in the CIP, an estimate of annual spending is $32,333 as shown in Table 5-4 below.

TABLE 5-3
BUILDING ANNUAL CAPITAL REPLACEMENT FORECAST

Building Component	Total Estimated Replacement Cost, $	Useful Life, YearsS	Annual Replacement Cost, $
Painting	65,000	10	6,500
HVAC	100,000	10	10,000
Carpet	100,000	10	10,000
Gates/Access/Perimeter	50,000	15	3,333
Roof	50,000	50	1,000
Solar	25,000	25	1,000
Gutters	5,000	10	500
TOTAL ANNUAL REPLACEMENT BUDGET			**$32,333**

Source: Staff's review of historical and projected spending.

SCADA Upgrades

As technology, automation, security, and communication abilities and needs evolve, it will be imperative for the District to maintain a sound and secure SCADA system. The project planned for FY 23 is budgeted at $85,600. A similar dollar amount is recommended to occur every 5 years for long-term financial planning purposes.

Lateral Replacement/Backflow Preventer Program

The 5-Year CIP shows this program maintaining a funding level of $100,000.

20-YEAR CAPITAL EXPENDITURE SUMMARY

To determine the long-term spending demands on the District, projections must be made as to when facilities will require replacement and what the cost to do so will be. With regard to when a facility would require replacement, age is often a key element. However, it is not the only contributing factor, hence the detailed development of the Predictive Failure Model in previous versions of District's planning documents to forecast the longevity of the pipeline asset based on properties of the pipeline itself (material, diameter, etc.) and installation environment (soil type, groundwater presence, etc.). The comparison of the projected timing of when facilities may require replacement to the District's actual and projected rates of replacement provide context as to how the District's current practices fare in comparison to potential future need.

The 2018 AMP projected that the 20-Year time frame would require an average pipeline replacement rate of 19,038 feet per 5 years (3,800 feet per year). At a replacement cost of $400 per foot, the annual expenditures over 5 years would be $7,615,200 and at a lining cost of $200 per foot, the expenditures over 5 years would be $3,807,600 or $761,520 per year. In a review of recent projects, and the preference toward lining over replacement, a long-term replacement cost per foot of $300 per foot is a reasonable estimate as described further below and presented in Appendix G.

From 2015 – 2022, the District's actual spending on pipeline replacement/rehabilitation (based on implementation of the Repair Priority List, Miscellaneous Line Repair, or CIP projects) was $9,670,000 (in 2022 dollars), which lined or replaced approximately 23,435 feet of pipeline (along with 95 manholes). In review of the yearly spending, this equates to rolling 5-year expenditures of approximately $1,360,000.

At a long-term spending rate of approximately $995,000 (with $205,000 toward Miscellaneous Line Repair and $790,000 toward gravity pipelines and manholes). The District will be able to, on average, repair/replace approximately 3,300 feet of pipeline (with manholes) per year (assuming a lining cost of $200 per foot for pipelines and an additional $100 per foot for manholes).

For comparison purposes, the FY23 CIPP Lining Project plans to address (8,361 feet of pipelines and 1 manhole installation to replace cleanout) at a budget of approximately $682,000, where the lining-focused project allows a greater footage to be accomplished.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

1. Identify and track locations of lined manholes.

2. Identify and track locations of inflow domes.

3. Continue submetering in areas of known or suspected inflow and infiltration.

4. Maintain a current GIS layer of the Repair Priority List.

5. Populate "Yes/No" column in Repair Priority List to indicate whether the line has previously been repaired and add reference to prior project/work order as appropriate.

6. Track Repair Priority List Completions, Miscellaneous Line Repairs, and Capital Improvement Projects in GIS/Inframap

7. When lining a pipeline in an area with chronic root issues, the lateral joints should be addressed, via either a top hat, T-liner, or other means.

8. When possible, spot repairs of pipelines should be addressed by lining the entire pipe segment, particularly on pipes greater than 40 years in age.

9. Aggregate manhole linings into a stand-alone project to take advantage of economies of scale.
10. Projects in the 5-Year CIP include:

    a. FY 2023 Gravity Pipeline Rehabilitation Project

b. Annual Gravity Pipeline and Manhole Rehabilitation Projects
c. Miscellaneous Line Repair (Pipelines and Manholes)
d. Headquarters Buildings
e. SCADA Upgrades
f. Lateral Replacement/Backflow Preventer Program

11. Projects in the 20-Year CIP include:

a. Annual Gravity Pipeline and Manhole Rehabilitation Projects

CHAPTER 6

PUMP STATIONS

The District has ten pump stations, the characteristics of which were discussed in detail in Chapter 2 and are summarized in Table 2-4 and reproduced as Table 6-1 below. This chapter describes the pump station overview sheets that were created for each station, the projection of flows anticipated at each station, recommendations for management of the pump station assets, and finally specific projects to implement in the 5-Year and 20-Year CIP. Long-term (20-Year) financial planning for the District pump stations, including their respective force mains, is discussed in this chapter. However, the management of the force main assets and their 5-Year CIP projects are discussed in Chapter 7.

TABLE 6-1
SUMMARY OF DISTRICT PUMP STATION CHARACTERISTICS

Pump Station	No. of Pumps	Capacity,[1] gpm	Motor Speed	Originally Built	Remarks
Avocado	2	300	Constant	1961	Station replaced in 2010 as submersible station.
Batiquitos	4	8,440	Variable	1974	Station improved and pumps replaced in 2013.
Diana	2	750	Constant	1963	Station replaced in 2010 as submersible station. Impellers replaced in 2020/2022.
Encinitas Estates	2	186	Constant	1974	Station replaced in 2022 as submersible station.
La Costa	2	2,200	Constant	1964	Pumps replaced in 2014.
Leucadia	5	4,000/720	Variable	1974	Station improved & pumps replaced in 2006 and in 2022.
Rancho Verde	2	185	Constant	1996	Station to be rehabilitated in 2023.
Saxony	2	900	Constant	1962	Rebuilt in 2016, except for force main.
Village Park 5	2	215	Constant	1974	Station replaced in 2017 as submersible station.
Village Park 7	4	15	Constant	1973	To be replaced with an E/One grinder pump station in 2023.

[1] Pump capacities represent nameplate information.

PUMP STATION OVERVIEW SHEETS

As part of the prior AMP, detailed pump station overview sheets were developed with critical information on each pump station. Updated versions are provided in Appendix G (sample below) and will continue to be updated as components are revised.

VILLAGE PARK 5 PUMP STATION OVERVIEW

GPS: 33°02'23.13"N 117°14'34.65"W Jurisdiction: Encinitas

Design Information

Pumps – 2 Submersible installed in October 2017
Size: 215 gpm at 105 ft. Static Lift: 93 ft.

Power
480 3Ø Motors: 11 HP and 1800 RPM
Generator: Yes 40 kW Fuel Storage: 119 gal & 20 hrs. at full load
Soft Start: Yes VFD: No
ATS: Yes Auto Transfer back to Commercial: Yes
Portable Generator Receptacle: Yes, with manual transfer switch

Security – Fenced

Force Main – 1 with a diameter of 6" made of PVC
Length: 1,945 ft. Velocity at 215 gpm: 2.44 fps
Meter Onsite: Yes Discharge MH #: 06-0270

Date Revised: 5/16/2018

Operational Information

Existing EDUs and Flow
EDUs to Station: 280
Existing gpd/EDU: 117 gpd/EDU
Flow to Station:
0.033 mgd = 23 gpm (117 gpd/EDU)
0.060 mgd = 42 gpm (215 gpd/EDU)
Peak Hr. Flow to Station: Factor 2.48
0.081 mgd = 56 gpm (117 gpd/EDU)
0.149 mgd = 104 gpm (215 gpd/EDU)
Peak 15 Min. Flow to Station: Factor 3.01
0.099 mgd = 68 gpm (117 gpd/EDU)
0.181 mgd = 126 gpm (215 gpd/EDU)

Buildout EDUs and Flow
EDUs to Station: 298
Buildout gpd/EDU: 117 gpd/EDU
Flow to Station:
0.035 mgd = 24 gpm (117 gpd/EDU)
0.064 mgd = 44 gpm (215 gpd/EDU)
Peak Flow to Station: Factor 2.48
0.086 mgd = 60 gpm (117 gpd/EDU)
0.159 mgd = 110 gpm (215 gpd/EDU)
Peak 15 Min. Flow to Station: Factor 3.01
0.105 mgd = 73 gpm (117 gpd/EDU)
0.193 mgd = 134 gpm (215 gpd/EDU)

Design Control Information
Wet Well Set Points: 60" Lead On
24" Lead Off
Other Set Points: 90" HWL
Operational Volume (gal): 636 gal
Design Pump Starts: 5 per hour

Actual Control Information
Actual Set Points: 37" Lead On
23" Lead Off
Other Set Points: 42"/23" Lag On/Off
45"/48" HWL/HWWL
17" LWL
Actual Operational Volume (gal): 250 gal
Actual Pump Starts: 4 per hour

Emergency Storage Volume
Wet Well Storage: 2,030 gal
Overflow Basin Storage: 0 gal
Average Storage Time: 89 min
Bypass Pumping Capability: Yes
Spills Before Station: No
MH# for Spill Over Point: VP5WW

Date Revised: 5/16/2018

BUILDOUT FLOW COMPARISON

The number of Buildout EDUs anticipated within each pump station basin was determined in detail as part of the prior AMP. Additionally, utilizing the District's seven submeters, an average wastewater generation rate in gpd/EDU was determined based on FY17 data. The FY17 data was also utilized to estimate the Peak Hour and Peak 15 Minute wet weather flow factors relative to the average dry weather flow. The results of this analysis are summarized in Table 6-2. Given the relatively consistent gpd/EDU from FY17 to now and the Buildout EDU projections from the prior AMP are still found to be valid, the flow analysis below is as presented in the prior AMP.

TABLE 6-2
PUMP STATION BASIN EDUs, GENERATION RATES, AND PEAKING FACTORS

Pump Station (Meter Basin)	Buildout EDUs	Meter gpd/EDU	Peak Hour Factor	Peak 15 min Factor
Avocado (L01)	629	153	3.20	3.40
Batiquitos (Bat & E1M)	31,974	138	2.66	2.86
Diana (L01)	2,801	153	3.20	3.40
Encinitas Estates (L03)	713	117	2.48	3.01
La Costa[1] (L04)	4,620	128	3.11	3.25
Leucadia[1] (L02, L03, L04)	25,074	136	2.65	2.89
Rancho Verde (L02)	255	199	2.37	2.40
Saxony (L06)	1,648	140	4.29	4.50
Village Park 5 (L03)	298	117	2.48	3.01
Village Park 7 (L03)	91	117	2.48	3.01

[1] Estimated peaking factors

Utilizing the data from Table 6-2, Table 6-3 was created to compare the Buildout Peak Hour and Peak 15 Minute flows that are anticipated at each station against the pumping rate from the station at peak flow.

TABLE 6-3
PUMP STATION CAPACITY VERSUS BUILDOUT FLOWS

Pump Station	Number of Pumps at Peak Flows	Pumping Rate at Peak Flow (gpm)	Peak Hour Buildout Flow (gpm)		Peak 15 min Buildout Flow (gpm)	
			215 gpd/EDU	Meter gpd/EDU[1]	215 gpd/EDU	Meter gpd/EDU[1]
Avocado	1 of 2	300	301	214	319	227
Batiquitos[2]	2 of 4	16,880	12,699	8,170	13,653	8,784
Diana	2 of 2	1,500	1,338	952	1,422	1,012
Encinitas Estates	1 of 2	186	264	144	320	174
La Costa	1 of 2	2,200	2,145	1,277	2,242	1,335
Leucadia	2 of 5	8,000	9,921	6,267	10,819	6,835
Rancho Verde	1 of 2	185	90	84	91	85
Saxony	1 of 2	900	1,056	687	1,107	721
Village Park 5	1 of 2	215	110	60	134	73
Village Park 7	2 of 4	30	34	18	41	22

[1] See Table 6-2.

[2] Flow rates are District only; however, Pumping Rate is total station (serving District and Encinitas).

Several stations have peak flow pumping rates that match very closely to the buildout peak wet weather flow rates assuming the 215 gpd/EDU generation rate, but may be oversized when considering actual generation rates in the basin. These include Avocado, Diana, La Costa, and Leucadia. For these stations, it is recommended to closely evaluate current and anticipated flows to the station at the time that replacement of the pumps is necessary to determine whether pumping capacity should be reduced to better match existing generation rates. If pumping capacity is reduced, the evaluation also needs to consider flow velocity within the force mains to prevent buildup of solids.

Two pump stations' peak flow pumping capacity exceeds all flow projections; namely Rancho Verde and Village Park 5. For these pump stations to be evaluated in the future, the District could consider flow monitoring upstream of the station to validate the wastewater generation rates and/or evaluate pump run time information prior to implementation of pump replacements. Encinitas Estates pumping capacity was reduced as part of the 2022 improvement project, and the same is anticipated to occur at Village Park 7.

At the Saxony Pump Station, there is insufficient pumping capacity at the 215 gpd/EDU generation rate, but sufficient capacity exists at the current average 140 gpd/EDU generation rate within the basin (and up to 180 gpd/EDU). Revising the pump size should be evaluated when the condition of the pumps warrants their replacement.

At the Leucadia Pump Station, there is insufficient pumping capacity at the 215 gpd/EDU generation rate, but sufficient capacity exists at the current average 136 gpd/EDU generation rate within the basin (and up to 173 gpd/EDU).

At the Batiquitos Pump Station, assuming Encinitas/Moonlight Pump Station historical average of 700 gpm (1 MGD) and peak flow of 1,225 gpm (1.76 MGD), the Batiquitos Pump Station has sufficient capacity. The District should contact Encinitas to understand their buildout flow projections at the time pump improvements are necessary at the station. Note the table above only includes the District flows for Batiquitos.

Batiquitos Bypass Pumping

As existing flows and future flow projections have dropped over time, the District could consider bypassing the Batiquitos Pump Station (for a portion of the District's flow) by pumping directly from the Leucadia Pump Station into one of the Batiquitos force mains. This would reduce the equipment wear at Batiquitos Pump Station and the District's overall electricity costs. The required improvements are shown in Figure 6-1. The force mains would be interconnected such that either of the Batiquitos force mains (or both) would continue to be used. The detailed hydraulic evaluation of this concept (which would include review of the Leucadia Pump Station pumps) could be done as part of the Batiquitos Pump Station Upgrade Project to plan for future implementation of the bypass.

LEGEND

- PS — District Pump Station
- Batiquitos Bypass
- District Gravity Sewers
- District Force Mains
- B1 Failsafe

B3 Force Main

B2 Force Main

IE: 2.26

IE: 2.22

BATPS

PS

CARLSBAD BL

PRIVATE RD

L1 Force Main

L2 Force Main

IE: 39.81

IE: 43.87

LA COSTA AV

N VULCAN AV

PRIVATE RD

Moonlight Force Main

ENCINITAS

CARLSBAD

0 100 200 400 Feet

LEUCADIA WASTEWATER DISTRICT

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 6-1

BATIQUITOS BYPASS
FORCE MAIN

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

DEXTER WILSON ENGINEERING INC.
Document Path: \\artic\GIS\10322\Report Figures\2nd_Submittal\Figure_6-1_Batiquitos Bypass.mxd
Date Saved: 4/11/2023 12:33:52 PM

EMERGENCY POWER

In the event of a power failure, emergency power is provided to each of the pump stations via either a permanent, on-site generator or connection of one of the District's trailer-mounted portable generators. The emergency power supply for each station is summarized in Table 6-4 below.

TABLE 6-4
PUMP STATION EMERGENCY POWER SUPPLY

Pump Station	Permanent Generator Onsite	Trailer-Mounted Portable Generator Ready
Avocado	No	Yes
Batiquitos	Yes	No
Diana	No	Yes
Encinitas Estates	Yes	Yes
La Costa	Yes	No
Leucadia	Yes	No [1]
Rancho Verde	No	Yes
Saxony	Yes	Yes
Village Park 5	Yes	Yes
Village Park 7	No	Yes

[1] The overflow basin pump can be powered by a trailer-mounted generator.

ASSET MANAGEMENT PLAN IMPLEMENTATION TO DATE

District field services staff visits each of the pump stations on a weekly basis to inspect the general condition of the pump station, checking for odors, vandalism, water leaks, and performing necessary corrective and preventative maintenance tasks. Detailed condition assessments of pump stations have occurred as described below.

Condition Assessment Activities

Following the 2008 AMP, in early 2009, IEC was tasked with the inspection of eight of the District's pump stations: Batiquitos, Village Park 7, Village Park 5, Encinitas Estates, La Costa, Leucadia, Saxony, and Rancho Verde. The remaining two pump stations, Avocado and Diana, were not evaluated as they were planned for complete replacement including force mains in 2010. Along with IEC, representatives from Simon Wong Engineering (structural engineers), RF Yeager Engineering (corrosion engineers), and Moraes/Pham and Associates (electrical engineers), conducted the condition evaluations.

Following the 2013 AMP, in 2014, IEC was again tasked with inspection of the District's pump stations, this time for all ten pump stations. Projects completed or nearly complete following the assessment include replacement of the Village Park No. 5 Pump Station as well as upgrades to the Batiquitos, La Costa, and Saxony Pump Stations.

Following the 2018 AMP, in 2020, IEC finalized the 2019 Pump Station Condition Assessment Report, which evaluated the electrical, mechanical, wet well lining, and miscellaneous items at the Avocado, Diana, Village Park 7, Rancho Verde, and Batiquitos Pump Stations. Stations for which improvement projects were recently completed or presently in design/construction were excluded from the assessment. Appendix H – Pump Station Inspections and Improvements, summarizes the improvements that have occurred at each station on a fiscal year basis.

Diana Pump Station Troubleshooting

For a period of time, the Diana Pump Station has been pumping flows at less than its design capacity. In a continued effort to maintain facilities at their rated capacity, Deraggers (which briefly reverse the impeller spin) were first installed at this station, which is highly prone to issues caused by disposable wipes. While this solved the pump ragging issue, it did not increase the station capacity. Following pump impeller replacement, replacement of the check valve with a different make/model has eliminated the wipes getting hung up on the check valve and returned the station to its full capacity.

Cathodic Protection

La Costa Pump Station and Village Park 7 pump stations both have impressed current cathodic protection systems to protect underground metallic components from corrosion. These systems are inspected as part of the District's annual cathodic protection activities.

Annual cathodic protection inspections of the pump station force mains for Leucadia and Batiquitos costs approximately $1,000 is captured in the Operations and Maintenance budget. Improvements are made as required, most recently in 2020.

FY21 Controls Project

The District-wide Controls Project was completed in FY21 and improved the Avocado, Diana, and Rancho Verde Pump Station controls.

FUTURE ASSET MANAGEMENT PLAN IMPLEMENTATION

The approach of conducting a thorough condition evaluation/assessment by a specialized group of professional engineers every five years has worked well. The inspections result in a prioritized list of projects which, for the most part, have been implemented. Going forward, it is recommended that future pump station inspection efforts continue the staggered inspection schedule based on the previous inspection, age of the asset, needs identified by the District, and the projected date of project implementation.

To that end, for the FY24 assessment, inspection should be a full condition assessment (Controls, Mechanical, Electrical, and Structural) for the Saxony Pump Station and other Electrical and Control Assessments as shown in Table 6-5 below. The condition assessments should be completed in the year prior to the planned CIP project (or sooner). For the specific components types, the general replacement and inspection schedule will be as follows:

- Controls – Replace every five years, thus inspect after four years. This is a reduction from previous planning as it has been recent experience that technology updates are required on a more frequent basis than the prior assumption of 10 years.

- Electrical – Replace every 20 years at satellite stations and 10 years at Batiquitos and Leucadia. Inspect all after nine years.

- Mechanical – Replace every 20 years at satellite stations and 10 years at Batiquitos and Leucadia. Inspect all after nine years.

- Structural – Replace cast-in-place larger stations after 100 years and precast smaller stations after 50 years. Inspect after nine years for 10-year maintenance.

TABLE 6-5
PREVIOUS AND PLANNED
PUMP STATION INSPECTION SCHEDULE

Pump Station	FY19 Completed Assessment	FY24 Proposed Assessment	Notes
Avocado	E, M, S(WW)	C	-
Batiquitos	E, M, S(WW)	C	-
Diana	E, M, S(WW)	C	-
Encinitas Estates	-	-	Station Replaced in 2022
La Costa	-	Full	-
Leucadia	-	-	Rehab in 2022
Rancho Verde	E, M, S(WW)	-	Rehab Planned in 2023
Saxony	-	Full	-
Village Park 5	-	E, C	-
Village Park 7	E, M, S(WW)	-	Station Replaced in 2023

Full = Full Assessment of Controls (C), Electric(E), Mechanical (M), and Structural (S). WW = wet well.

The District could consider the refinement of its detailed checklist of component inspection for each station. The basis for this would be prior inspection reports with additions by staff as appropriate.

The District could also consider the continued maintenance of its pump station component tracking database. This would be used to track improvements and associated costs to better project future spending. This would combine the efforts already occurring as part of the SSMP audit process as well as the financial tracking done for capital asset depreciation.

5-YEAR CIP AND DISCUSSION

The 5-Year CIP for pump stations is primarily based upon the 2019 pump station evaluations (report dated 2020) coordinated by IEC, as well as projects subsequently identified by District field services staff. Each of the projects discussed below is included in the 5-Year CIP, the scope of which may be revised based on subsequent inspections and ongoing operation and maintenance. Costs exclude soft costs, and have been increased by Engineering News Record (ENR) to 2022 dollars.

Avocado Pump Station Projects

Avocado Pump Station Upgrade Project. The estimated cost for this project is $816,750 ($605,000 plus 35% soft costs) based on the replacement planning costs for controls, electrical, and mechanical. Project scope includes:

From 2020 report:

- Replace pumps with chopper pumps and purchase 3rd spare pump (existing pumps installed in 2010).
- Replace hatches and miscellaneous hardware.
- Replace force main isolation valves.
- Improve vaults.
- Add permanent generator.

Current Staff Input:

- Pump replacement with chopper pumps not necessary for project at this time.
- Generator cost ($306,500 of total cost) could be reprioritized, if necessary.

Batiquitos Pump Station Projects

Batiquitos Emergency/Overflow Basin Inspection. This project consists of inspection of the emergency basin, currently budgeted at $35,000. With a placeholder repair estimate of approximately $530,000. The repair cost is anticipated to be combined in the overall Batiquitos Pump Station Rehabilitation Project.

Batiquitos Emergency Basin Pump Installation. This project would install a permanent submersible pump in the emergency basin of the pump station providing the ability to quickly begin pumping out of the basin in the case of an emergency. The design and construction cost of this pump installation is estimated to be $1,200,000. This cost is anticipated to be combined in the overall Batiquitos Pump Station Rehabilitation Project.

Batiquitos Pump Station Rehabilitation Project. This project consists of several improvements as summarized below:

- Replace 4 Pumps: $790,000 total.
  - Evaluate reconfiguring of Batiquitos Pumps and the potential for downsizing.
- Replace discharge header: $350,000
- Reline Emergency Basin (described above): $570,000
- Add carbon scrubber for Emergency Basin air treatment: $100,000
- Emergency Basin Submersible Pump Install (described above): $1,200,000
  - Note the above cost was a 2022 contractor-provided standalone cost for the addition of the pump and associated piping. In bidding the overall Batiquitos Pump Station Rehabilitation Project, the cost/benefit of the line item improvement can then be reassessed.
- Replace and relocate existing 500kW generator with one of the same size to eliminate flood potential: $290,000
- Evaluate ECO_2 as replacement odor control for the existing carbon system: $250,000
- Flood-Proofing - Installation of flood-proof doors, ensuring all hatches are water tight, and flood-proofing vents: $250,000
- Miscellaneous: $100,000
  - PROJECT TOTAL CONSTRUCTION COST: $3,900,000

Diana Pump Station Projects

As discussed previously, troubleshooting efforts in 2022 at the Diana Pump Station have returned the facility to its design capacity. These efforts included replacement of impellers and check valves. As such, these items have been removed from the anticipated scope of the project as defined in the March 2020 Pump Station Condition Assessment Report.

Diana Pump Station Upgrade Project. The estimated cost for this project is $945,000 ($700,000 plus 35% soft costs) based on the March 2020 IEC Report. Project scope includes:

From March 2020 report:

- Emergency Generator $450,000
- New Conduit $50,000
- Miscellaneous Repairs $100,000

Staff Input

- Property Site Expansion $100,000

Diana Emergency Generator Project. This pump station does not have emergency power or overflow storage. There are two locations presently under consideration for the installation of an emergency generator – either immediately across Diana Street or east of the on the east side of Highway 101 across from Diana Street. The first alternative would require an easement or property purchase from the landowner, whereas the second alternative would require the approval of the North County Transit District as the proposed location is within their right-of-way.

Rancho Verde Pump Station Improvement Project

The 2019 Pump Station Assessment recommended the rehabilitation of this station to add mechanical, electrical, drainage, and address access concerns. More specifically, the project will replace mechanical, electrical, and site components including check valves, isolation valves, bypass piping, level controls, and site paving (among others). It also includes an evaluation of whether 480V electrical service is possible. $419,000 has been appropriated for design and initial construction, with a total estimated construction cost of $924,000, which is a total cost of $1,247,400.

Village Park 7 Pump Station Rehabilitation Project

The 2018 AMP estimated cost for this project was $625,000 based on the replacement costs for controls, electrical, and mechanical following the FY14 assessment. The 2019 Pump Station Assessment recommended replacement of the station rather than rehabilitation. During preliminary project design, because of the station size, the District team determined to replace the station with an Environment One Corporation (E/One) Grinder Pump Station. The new E/One station will require the installation of a 2-inch HDPE force main. The existing 6-inch PVC force main will remain in place to be used if bypassing of the pump station is required. With installation of the packaged E/One station, the old wet well will be used as an overflow basin. The total cost is estimated to be $917,000.

Project construction was awarded in July 2022 at a cost of $795,500. Construction commenced in March 2023.

Additional Pump Station Projects

Pump Station Condition Assessment. A planning cost of $50,000 is included in FY24 to conduct the pump station inspections outlined previously in this chapter. The increased budget amount will allow for incorporation of controls and communication assessment into the overall scope.

Annual Cathodic Protection Assessment. As part of the force main cathodic protection activities, the impressed current systems at La Costa and Village Park 7 are monitored on an annual basis. As these pump stations are improved, it is anticipated that these impressed current systems will be removed.

20-YEAR CAPITAL EXPENDITURE SUMMARY

This section describes those specific projects that are anticipated in the 20-year time as well as the approach to long-term capital spending estimates. A comparison of recent actual costs is also provided.

Specific Projects

La Costa Pump Station Replacement. This project consists of replacement of the existing La Costa Pump Station located adjacent to the tennis courts at the Omni La Costa Resort and Spa. This project will evaluate and implement either (1) removal of the station via gravity improvements, (2) relocation of the station as a submersible pump station to the parking lot or another location suitable to both the District and Omni La Costa, or (3) replacing in place as a submersible station. Previous inspection reports (FY14) recommend replacement in the 2035 timeframe. The estimated replacement cost is $3,310,000.

Long-term Capital Replacement

This section develops the estimated replacement cost for each pump station and corresponding force main(s) and is intended primarily to aid the District in their long-term financial planning. These General Pump Station Replacement costs are utilized in the CIP for years where specific pump station and force main capital improvement projects have not already been identified.

Replacement Categories

Pump stations are divided into five categories for replacement in addition to the force mains. These categories are controls, electrical, mechanical, structural, and regulations; each of these further discussed below.

Controls. It is assumed that the useful life of the control system of a pump station is 5 years. With rapid advancement and evolution in technology, this has been reduced from the previous estimate of 10 years. The controls replacement cost for the Batiquitos and Leucadia pump stations was previously estimated to be $280,000 every 10 years; the new replacement reports increase this amount to $163,000 every five years (i.e. $300,000 every ten years and a maintenance cost of $2,500 per year). For all other pump stations, the previous controls replacement cost for all other pump stations was estimated to be $55,000 every 10 years; the new replacement reports assume $88,000 every 5 years (based on $150,000 for full replacement every 10 years and a maintenance cost of $2,500 per year).

Electrical. The useful life of electrical facilities at pump stations is related to age as well as how long a manufacturer supports a product for parts and maintenance. The useful life of the electrical equipment was assumed to be 10 years for the Batiquitos and Leucadia pump stations, and 20 years for all other pump stations. The electrical replacement cost for the station is dependent on the station horsepower and the emergency power source. Pump stations with a higher horsepower or with an emergency generator onsite are estimated to have a higher electrical replacement cost.

Mechanical. The useful life of mechanical systems at pump stations, which include all piping, pumps, compressors and similar equipment can vary based on the size and type of equipment. The useful life of the mechanical systems was assumed to be 10 years for the Batiquitos and Leucadia pump stations and 20 years for all other pump stations. The mechanical replacement costs were estimated to be higher for pump stations with a higher pump capacity, force main size, and station horsepower.

Structural. The structural life of the pump station depends on the construction of the wet well. For pump stations with a cast-in-place wet well, the useful life was assumed to be 100 years. For pump stations with a pre-cast wet well, the useful life was assumed to be 50 years. The estimated structural replacement costs are for wet well replacement only for the smaller stations that do not have an onsite building. For the larger stations (Leucadia and Batiquitos) that do have an onsite building, the estimated structural replacement cost includes both the wet well and building replacement.

Regulations. A category for regulations was added to the replacement analysis. This is to try to anticipate costs due to increasing regulations for pump stations. For larger pump stations, a cost was added every 10 years for regulatory changes. For smaller pump stations, a cost was added every 20 years. The estimated regulations cost is based on the size of the pump station and the seriousness of the spill location. For example, a large capacity station in close proximity to a sensitive area will have a higher estimated regulations cost. This also relates to air quality regulations.

Force Mains. Replacement of an individual force main is contemplated to occur every 50 years. With dual force mains at most of the pump stations, the force main replacement is assumed to stagger (i.e. one of the pump station's force mains replaced every 25 years).

Summary of Pump Station and Force Main Expenses

Table 6-6 provides a summary of the total estimated replacement cost for each station (including force mains). Table 6-7 provides a summary of pump station and force main expenses between now and the Year 2075. Appendix J provides the individual replacement reports for each station. For long-term financial planning, in review of Table 6-7, District pump station expenditures (including force mains) are expected to total approximately $48,000,000 over the next 20 years.

TABLE 6-6
SUMMARY OF PUMP STATION AND FORCE MAIN REPLACEMENT COSTS
(in $1,000s)

Pump Station	Replacement Construction Cost	35% Soft Costs	Total Replacement Cost
Avocado	1,898	665	2,563
Batiquitos	13,147	4,602	17,749
Diana	2,533	887	3,420
Encinitas Estates	3,003	1,052	4,055
La Costa	3,488	1,221	4,709
Leucadia	12,668	4,434	17,102
Rancho Verde	1,443	506	1,949
Saxony	1,863	653	2,516
Village Park 5	2,538	889	3,427
Village Park 7	1,758	616	2,374

TABLE 6-7
53-YEAR PROJECTED PUMP STATION EXPENDITURES [1]

Pump Station	2023-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070	2071-2075	TOTAL
Avocado	108	893	388	163	108	893	108	163	108	893	683	**4,508**
Diana	893	108	163	843	893	108	163	108	1,628	403	163	**5,473**
Encinitas Estates	113	113	853	1,143	113	113	168	1,828	113	113	463	**5,133**
La Costa	298	1,888	128	128	738	1,158	128	128	298	1,598	128	**6,618**
Leucadia	1,478	1,878	4,358	5,643	1,478	1,878	1,478	1,878	1,478	1,878	1,478	**24,903**
Saxony	343	118	1,438	368	118	118	1,148	343	143	118	1,138	**5,393**
Village Park 5	108	108	108	1,548	108	108	108	948	708	108	403	**4,363**
Village Park 7	1,243	108	108	528	948	108	108	108	1,368	108	108	**4,843**
Rancho Verde	948	213	108	108	948	108	508	108	948	108	108	**4,213**
Construction Cost	5,532	5,427	7,652	10,472	5,452	4,592	3,917	5,612	6,792	5,327	4,672	**65,447**
35% Soft Costs	1,936	1,899	2,678	3,665	1,908	1,607	1,371	1,964	2,377	1,864	1,635	**22,906**
SUBTOTAL	**7,468**	**7,326**	**10,330**	**14,137**	**7,360**	**6,199**	**5,288**	**7,576**	**9,169**	**7,191**	**6,307**	**88,353**
Joint Facilities Batiquitos	3,133	466	9,068	466	3,133	466	3,133	6,401	3,133	466	3,133	**32,996**
35% Soft Costs	1,097	163	3,174	163	1,097	163	1,097	2,240	1,097	163	1,097	**11,548**
SUBTOTAL	**4,230**	**628**	**12,242**	**628**	**4,230**	**628**	**4,230**	**8,641**	**4,230**	**628**	**4,230**	**44,544**
TOTAL COST	**11,698**	**7,955**	**22,572**	**14,766**	**11,590**	**6,828**	**9,518**	**16,217**	**13,399**	**7,820**	**10,537**	**132,897**

[1] All numbers are in thousands of dollars.

Comparison of Actual Costs – Project Specific

In 2017, the Village Park 5 Pump Station was almost completely replaced. The main components not replaced during this project were the generator and the force main. The total construction cost for this project was $780,751. With soft costs, the fully burdened cost was $1.0 million. In 2023, this equates to a cost of $1,209,500. (January 2017 ENR = 11,555.03, January 2023 ENR = 13,989.79).

Around 2021, significant improvements were made to the Leucadia Pump Station in the amount of $5,225,000. All pumps were replaced, bypass pumping was added, significant odor control improvements were made which essentially resulted in a pump station site expansion to the opposite side of the driveway entrance. There were little to no improvements made to the building or concrete structures around the existing site.

In 2022, the Encinitas Estates Pump Station was completely replaced at a total cost of $2,345,000. The prior AMP projected a construction cost of $1,195,000. With 35% soft costs and an adjustment to June 2022 costs using ENR, the total planning cost was $1,823,150. (January 2018 ENR = 11,935.82, June 2022 ENR = 13,488.65). Thus, the District projected cost (based on the 2014 Condition Assessment) and the 2018 AMP replacement projections were low. This cost excluded generator replacement, but included relocation, as such the total replacement cost for Encinitas Estates is set close to the actual 2022 cost. For remaining stations, adjustments to replacement costs have been made to reflect the higher bid prices. Tracking costs in Appendix K will strive to maintain replacement reports generated in future asset plans are meeting (or exceeding) actual expenditures.

Comparison of Actual Costs – Historical Spending Trends

In review of historical pump station spending (excluding force mains), pump station expenditures have totaled approximately $16 million over the eight fiscal years 2015 – 2022, which is approximately $2,000,000 per year on average (including soft costs).

SUMMARY OF RECOMMENDATIONS

1. Evaluate pump size at each station based on actual flow generation rates and anticipated peak buildout flows when pump replacement dictates.

2. Further evaluate bypassing the Batiquitos Pump Station (for a portion of the District's flow) by pumping directly from the Leucadia Pump Station into one of the Batiquitos force mains.

3. Beyond FY24, stagger future pump station inspection efforts based on the previous inspection, age of the asset, needs identified by the District, and the projected date of project implementation.

4. Consider the preparation of a detailed checklist of component inspections for each station. The basis for this would be prior inspection reports with additions by staff as appropriate.

5. Consider the maintenance of a pump station component tracking database. This would be used to track improvements and associated costs to better project future spending. This would combine the efforts already occurring as part of the SSMP audit process as well as the financial tracking done for capital asset depreciation.

6. Continue efforts to reduce inflow and infiltration via inflow dome installation in manholes, smoke testing, and lining projects with lateral top hats.

7. The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 5-Year CIP.
    a. Batiquitos Emergency/Overflow Basin Inspection
    b. Batiquitos Pump Station Upgrade Project (includes the Emergency Basin Lining and Pump Installation)
    c. Diana Pump Station Upgrade Project
    d. Rancho Verde Pump Station Improvement Project
    e. Village Park 7 Pump Station Rehabilitation Project
    f. Pump Station Condition Assessment
    g. Annual Cathodic Protection Assessment

8. The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 20-Year CIP.
   a. Avocado Pump Station Upgrade Project
   b. La Costa Pump Station Replacement Project

9. For financial planning purposes, in years when significant pump station or force main capital replacement projects are not occurring, expenses are anticipated based on the forecasted General Pump Station Replacement costs provided in Table 6-7.

10. For long-term financial planning, District pump station expenditures (including force mains) are expected to total approximately $48 million over the next 20 years.

CHAPTER 7

FORCE MAINS

The District has 10 pump stations and approximately 11 miles of force mains. The force mains range in size from 2-inch diameter to 24-inch diameter and are constructed primarily of ductile iron (DIP) polyvinyl chloride (PVC), and high-density polyethylene (HDPE), with small sections of cast iron (CIP) and PVC-lined asbestos cement (AC). Table 7-1 contains a summary of the force main characteristics.

TABLE 7-1
SUMMARY OF DISTRICT FORCE MAIN CHARACTERISTICS

Force Main	Diameter, inches	Individual Length, feet	Material	Discharge Manhole	Year Installed
Avocado	6	275	Original: AC (PVC- lined) Parallel: PVC	03-0130	Original: 1962 (lined in 2010) Parallel: 2010
Batiquitos, B2 Batiquitos, B3	24 24	10,240 10,134	PVC DIP/PVC	LKT-1000 LKT-2000	1996/2011/2015 1988/'96/'11/'20
Diana	10	2,300	First 250' Paralleled PVC	03-0105	2010
Encinitas Estates	6	2,230	PVC	05-9080	2010
La Costa	10/12	1,127	CIP/PVC/HDPE*	10-0128	1965/98
Leucadia, L1 Leucadia, L2	24 24	13,989 14,000	DIP/PVC PVC/DIP/HDPE	03-0980 03-0992	1979/'98/'01/'17 1996/'01/'03
Rancho Verde	4	460	PVC	08-12160	1997
Saxony**	8	80	DIP	L1/L2 FM	1999/2001
Village Park 5	6	1,945	PVC	06-0270	2008
Village Park 7	2	1,500	HDPE	07-0330	2023

* The remaining CIP is a short section within the station. The original 10-inch force main discharges to the 1998 HDPE section to cross San Marcos Creek.

**Pumps into L1 or L2, whichever is operational.

Note – All force mains can be bypassed except for Rancho Verde.

ASSET MANAGEMENT PLAN IMPLEMENTATION TO DATE

Four of the eight satellite pump stations' force mains were installed within the last 15 years. The remaining four satellite pump station force mains are approximately 16 to 25 years old. As such, over the last 10 years, force main work has focused on the four Leucadia and Batiquitos Pump Station Force Mains. Detailed tracking of the asset replacement activities for these force mains (two serving each station) can be found in Figures 7-1 through 7-4.

Leucadia Pump Station Force Main L1

TABLE 7-2
L1 FORCE MAIN HISTORY

YEAR	EVENT	Station Begin	Station End	Length, feet
1979	L1 installed, ductile iron	0+17	139+45	13,928
1998	L1 18" Railroad bridge crossing removed and replaced	~137+40	~138+68	128
Early 2001	Installation of cathodic protection (Carlsbad Dwg. No. 358-2)	13+11	96+48	8,337
Late 2001	• L1 replaced with PVC • L1 lined with 70psi cured-in-place-pipe (CIPP)	0+40 6+10	6+10 19+50	570 1,340
2009	Replacement of gravity section at La Costa/Highway 101 Interchange (discharge)	-*	-*	64
2017	Replacement of L1 West Section, C905 DR18 PVC	-	-	2,450 **
2017	CIPP lined railroad bridge section	-	-	150 **

*As gravity sewer, this is downstream of force main stationing.

**Confirm footage with as-built drawings

In FY17 and FY18, project improvements replaced approximately 2,450 feet with 24-inch PVC and CIPP lined the approximately 150 feet long, above-ground, railroad bridge. With completion of this project, approximately 9,000 feet of the original 1979 ductile iron pipeline remains. For financial planning purposes, the long-term CIP replacement cost of the 9,000 feet assumes a lining cost of $3,400,000 ($280 per linear foot plus 35% soft costs).

Prior to replacement, assessment of the remaining pipeline is recommended by performing destructive testing and internal inspection. The proposed approach for these assessments is provided in the summary of recommendations at the end of this chapter.

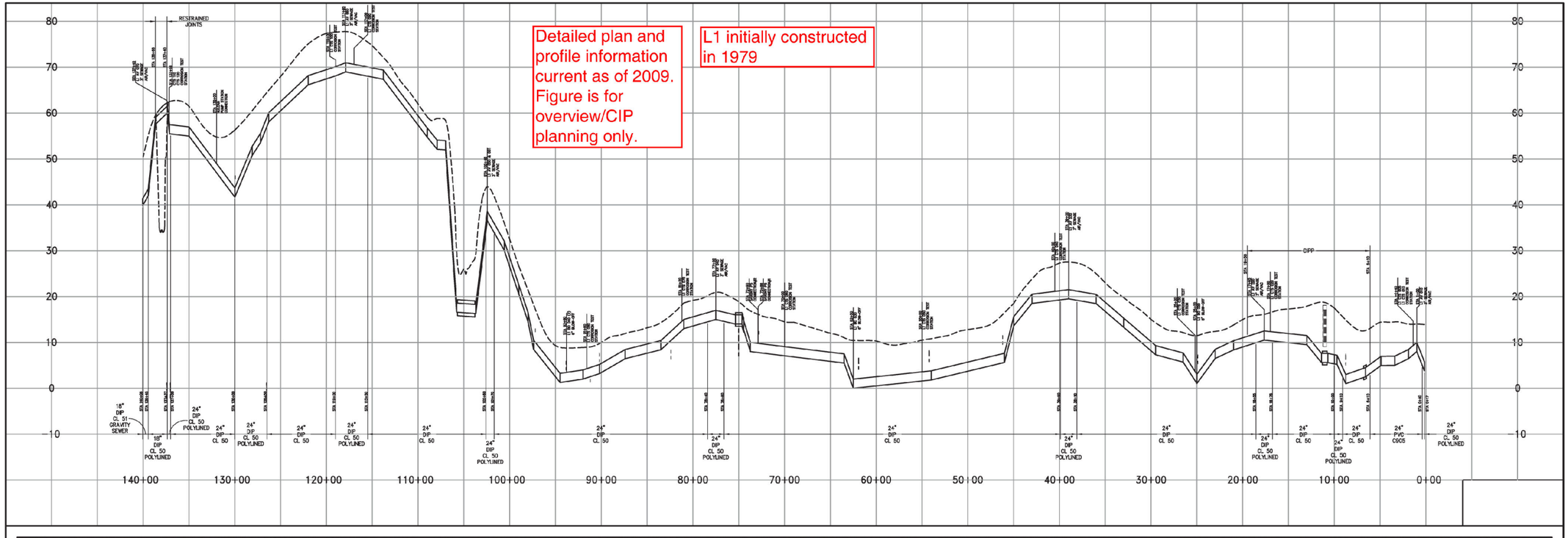

FIGURE 7–1

FORCEMAIN L1
PLAN AND PROFILE HISTORY

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

LEUCADIA WASTEWATER DISTRICT

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Leucadia Pump Station Force Main L2

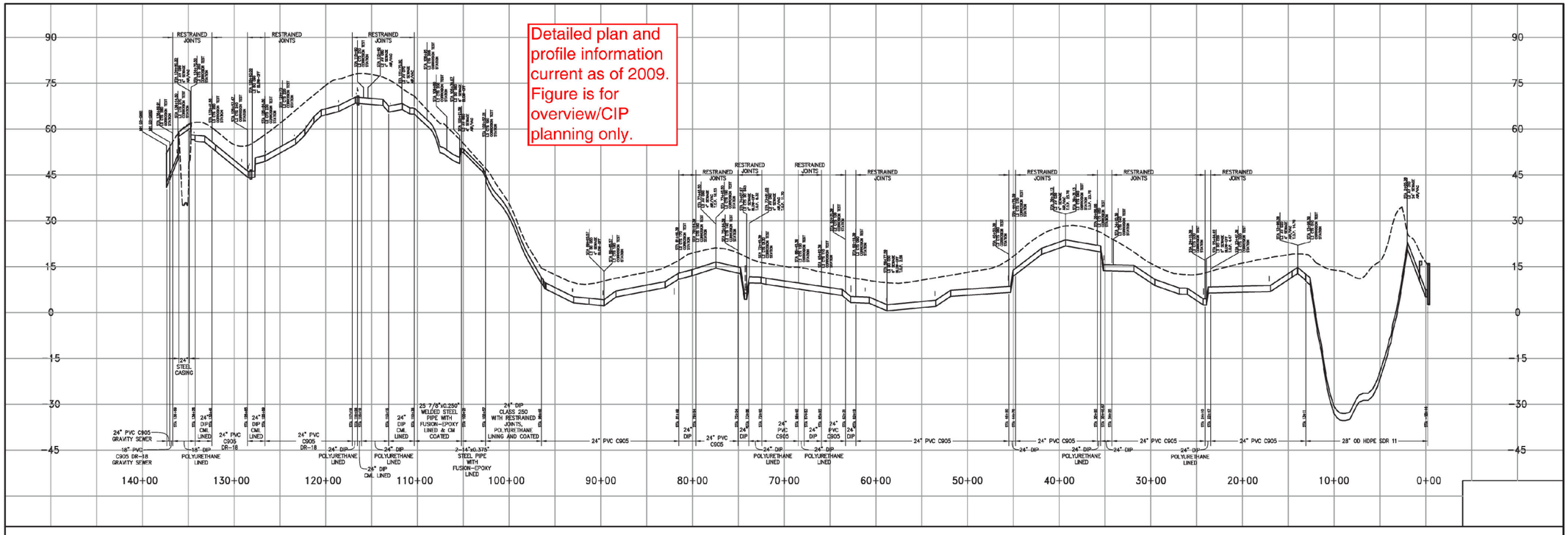
TABLE 7-3
L2 FORCE MAIN HISTORY

YEAR	EVENT	Station Begin	Station End	Length, feet
1996-1997	L2 Phase 1 installed, welded steel (lined) (CalTrans Interstate 5 Interchange)	96+48	110+39	1,391
Early 2001	L2 Phase 2 installed, PVC w/DIP sections (some lined, some not) (from El Camino Real to east side of I-5)	13+11	96+48	8,337
Late 2001	L2 Phase 4 (LWD CAD Ref. No. 1228_75) • L2 HDPE installation (from Leucadia Pump Station through El Camino Real)	-0+18.44	13+11	1,329
2003	L2 Phase 3 installed, PVC and DIP (lined) (west side of I-5 to Coast Highway 101/Carlsbad Blvd, LWD CAD Ref. No. 1493-76)	110+39	136+79	2,640
2009	Replacement of gravity section at La Costa/Highway 101 Interchange (discharge)	-*	-*	128

*As gravity sewer, this is downstream of force main stationing.

Although the L2 force main is primarily PVC, there are sections of welded steel and ductile iron (some lined, some not).

Annual cathodic protection evaluations are performed by RF Yeager Engineering. The completed FY18 and FY21 cathodic protection project improvements included replacing the existing anodes due to declining anode current outputs.



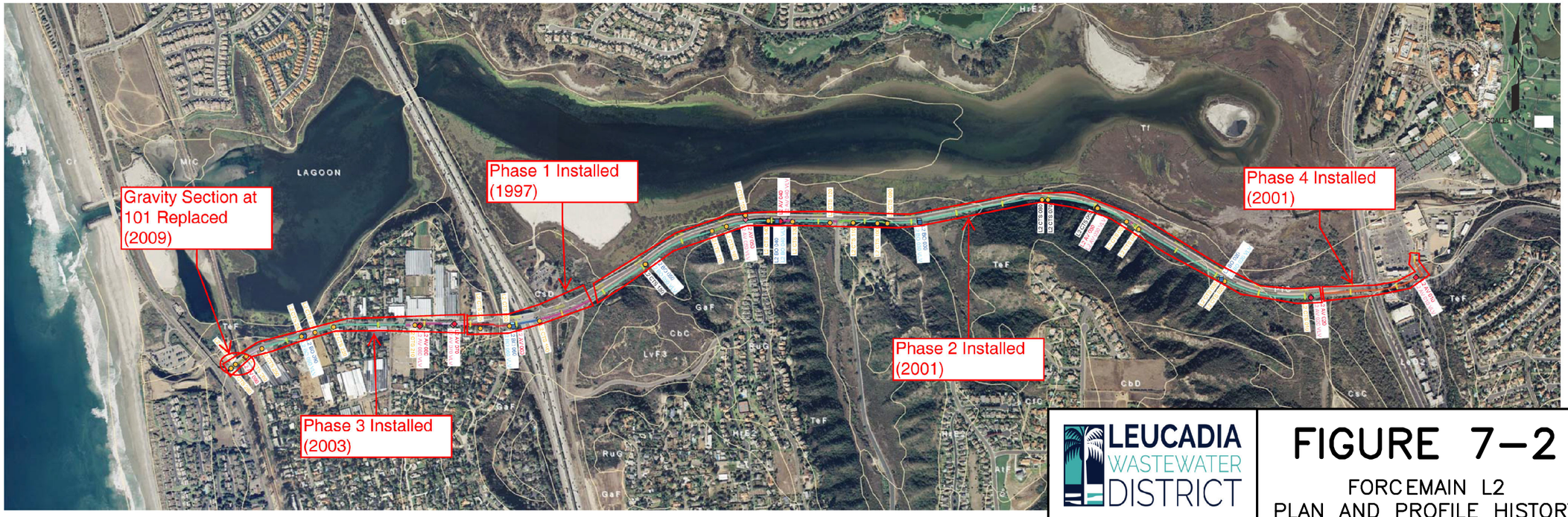


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FIGURE 7-2

FORCEMAIN L2
PLAN AND PROFILE HISTORY

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

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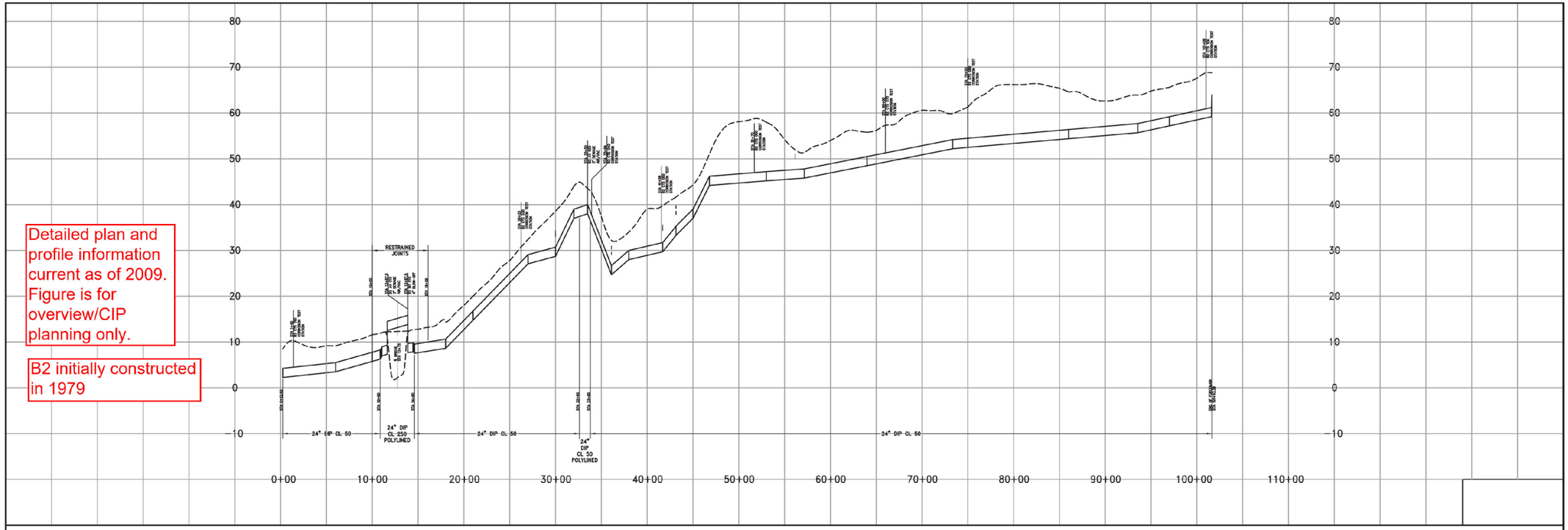
Batiquitos Pump Station Force Main B2

The installation history of the B2 force main is summarized in the table below. The oldest section is the 27-year-old above-ground, polylined, ductile iron bridge crossing.

TABLE 7-4
B2 FORCE MAIN HISTORY

Year	Event	Station Begin	Station End	Length, feet
1979	B2 Phase 2 installed – ductile iron	0+22.62	102+63.29	10,240.67
1996	Adjust B2 alignment over Batiquitos Lagoon bridge – ductile iron (lined)	10+80	14+60	380
2011	Partial replacement from the Batiquitos Pump Station to the San Marcos Creek Bridge. Force Main was replaced with 24-inch DR18 C905 PVC.	-	-	1,100
2011	Partial replacement from the San Marcos Creek Bridge to the north. Force main was replaced with 24-inch DR18 C905 PVC.	-	-	400
2015	B2 replacement – DR18 C905 PVC (same trench as B1)	-	-	8,463



LEUCADIA WASTEWATER DISTRICT

FIGURE 7–3

FORCEMAIN B2
PLAN AND PROFILE HISTORY

LEUCADIA WASTEWATER DISTRICT
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Batiquitos Pump Station Force Main B3

The installation history of the B3 force main is summarized in the table below. Approximately 80% of this pipeline is ductile iron 35 years in age. The pipeline was evaluated by IEC in 2011 and recommended for replacement in FY25 at that time.

In 2019, approximately 730 feet of the discharge end of the force main was replaced, leaving approximately 7,950 feet of the original ductile iron line in place.

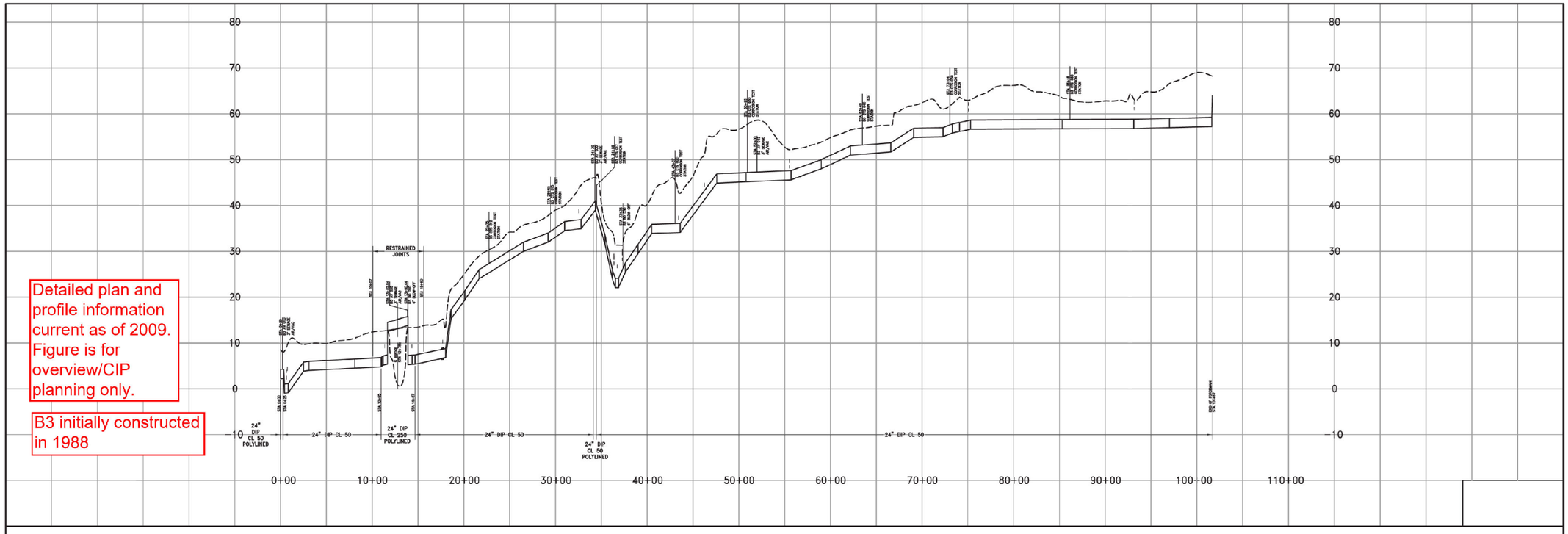
Annual cathodic protection evaluations are performed by a licensed corrosion engineer and repairs to the cathodic protection system are completed as recommended.

For financial planning purposes, a lining project has been added to the long-term CIP to line the ductile iron section at a cost of $3,100,000.

Prior to replacement, assessment of the remaining pipeline is recommended by performing destructive testing and internal inspection. The proposed approach for these assessments is provided in the summary of recommendations at the end of this chapter.

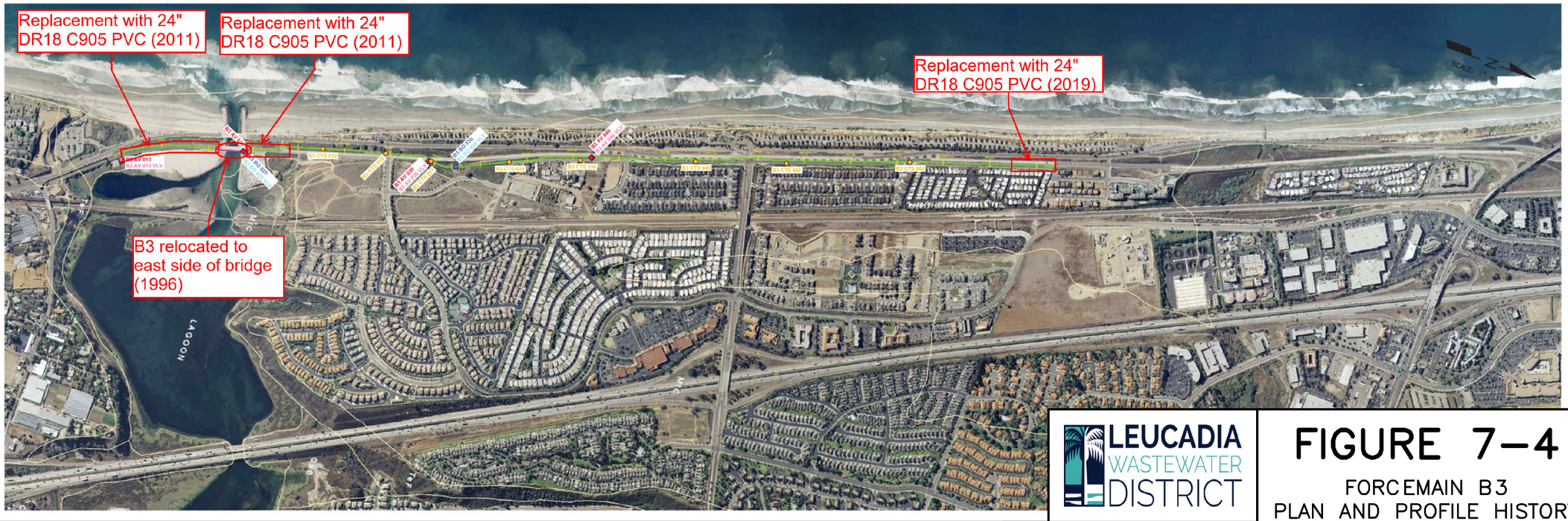
TABLE 7-5
B3 FORCE MAIN HISTORY

YEAR	EVENT	Station Begin	Station End	Length, feet
1988	B3 Phase 3 installed – ductile iron	0+00	101+67	10,167
1996	Relocate B3 to east side of Batiquitos Lagoon bridge	10+95	14+67	372
2011	Partial replacement from the Batiquitos Pump Station to the San Marcos Creek Bridge. Force Main was replaced with 24-inch DR18 C905 PVC.	-	-	1,100
2011	Partial replacement from the San Marcos Creek Bridge to the north. Force Main was replaced with 24-inch DR18 C905 PVC.	-	-	400
2019	Replacement of the DIP discharge with 24-inch DR18 C905 PVC	-	-	~730



Detailed plan and profile information current as of 2009. Figure is for overview/CIP planning only.

B3 initially constructed in 1988



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LEUCADIA WASTEWATER DISTRICT

FIGURE 7-4

FORCEMAIN B3
PLAN AND PROFILE HISTORY

LEUCADIA WASTEWATER DISTRICT
2023 ASSET MANAGEMENT PLAN

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Annual Cathodic Protection Surveys

Cathodic protection surveys are completed on the Leucadia and Batiquitos force mains on an annual basis. As a result of these inspections, improvements to test stations are made and sacrificial anodes are replaced as necessary. In addition to the passive systems on these force mains, there are impressed current cathodic protections system on the metallic piping at the La Costa Pump Station. Capital repairs arising out of the force main inspections are estimated at $15,000 per year based on the surveys and projects completed in the 2014 to 2020 time frame. The annual survey fee (an O&M cost) is approximately $6,800 per year (approximately $4,500 is the District's share).

SUMMARY OF RECOMMENDATIONS

1. Destructive Testing of Metallic Force Mains L1 and B3

To aid in condition assessment of L1 and B3, it is recommended to physically expose portions of the ductile iron portions of these two force mains in strategic locations. In exposing high points of the line, 50 feet of new PVC line would be installed in either direction. The removed sections would be inspected by a corrosion engineer (along with the exposed tie-in points) and sent for destructive laboratory testing (as recommended by the corrosion engineer) to assess whether the replacement date currently shown in the CIP should be revised. In excavation of low spots, the protective baggie surrounding the pipeline, as well as the underside of the pipeline exterior, would be visually inspected.

2. Internal Inspection of L1 or B3

Lining projects have been added to the 20-Year CIP to line the remaining ductile iron sections of the Batiquitos B3 and Leucadia L1 force mains. In the interim, and to better determine the appropriate timing of the lining project, an internal inspection of the entire pipeline length could be made. Various inline inspections techniques and equipment were reviewed in detail as part of the 2009 force main evaluation plan. The access requirements, disruption to operations, reliability of inspection, and cost, all led to the conclusion that the available options were not viable to District at that time. In 2022, a local vendor reviewed the ability to launch and retrieve an in-line inspection tool to assess force main condition from the Batiquitos and Leucadia pump stations. The preliminary proposal provided a cost to inspect all four force mains. With L2 being primarily PVC,

inspection of L1 would be preferred. Similarly, for Batiquitos, with B2 being primarily PVC (except for the bridge crossing), inspection of B3 would be preferred.

The District could choose to inspect both B3 and L1. B3 has a more uniform profile and allows easier access for equipment installation and retrieval (decreasing overall project costs). L1 cathodic protection may not be as sound as B3 given the post-construction installation of jumper bonds when L2 was installed in 1999. It is recommended to discuss inspection prioritization of L1 versus B3 with a corrosion engineer with knowledge of these particular force mains to garner their input from a corrosion perspective, and to prioritize the completion of that project first. Projects for both force mains have been included in the CIP.

3. The following replacement-based capital improvement projects are recommended or are planned by the District and are included in the District's 5-Year CIP.
   a. L1 Destructive Testing
   b. L1 Internal Condition Inspection
   c. B3 Destructive Testing

4. The following replacement-based capital improvement projects are recommended or are planned to be included in the District's 20-Year CIP:
   a. B3 Internal Condition Inspection
   b. L1 Final Replacement/Lining
   c. B3 Final Replacement/Lining

5. Update composite figures for each force main based on record drawings of recent improvements.

6. Include $15,000 in annual long-term capital expenses related to cathodic protection repairs and improvements.

CHAPTER 8

JOINTLY-OWNED GRAVITY SEWERS

This chapter describes those gravity sewers which the District owns with other wastewater collection agencies: the Batiquitos Influent Sewer, the Lanikai Gravity Sewer, and the Occidental Sewer.

BATIQUITOS INFLUENT SEWER

The Batiquitos Influent Sewer is jointly-owned by the District and Encinitas. It is approximately 890 feet of 24-inch C905, 165 psi, PVC gravity sewer located immediately upstream of the Batiquitos Pump Station. Encinitas' Moonlight Beach Pump Station force main discharges into a manhole connected to the upstream end of this pipeline, combining with District flows prior to entering the Batiquitos Pump Station. The Batiquitos Influent Sewer was replaced in FY10.

As the majority owner (the District has 77.86% ownership) and given its proximity to the District and its facilities, the District is the responsible agency for the ongoing operation and maintenance of this pipeline, including capital repair and replacement. The line was most recently CCTV inspected in FY23 and was found to be in good condition.

LANIKAI GRAVITY SEWER

The Lanikai Gravity Sewer is jointly-owned by the District (77.86 percent) and Encinitas (22.14 percent). It was originally installed in 1972 and is approximately 725 feet long. Sewage flows west to east in this line, beginning at the discharge of the Batiquitos Pump Station force mains and connecting to the Occidental Sewer in Avenida Encinas.

As the majority owner and due to its proximity to the District and its facilities, the District is the responsible agency for the ongoing operation and maintenance of this pipeline, including capital repair and replacement.

In 2016 the North County Transit District (NCTD) and San Diego Association of Governments (SANDAG) approached District staff about the Poinsettia Train Station improvement project to construct an underground pedestrian tunnel at the station and to shift the existing railroad tracks to the west. As a result, the District's construction of the Poinsettia Station Improvements (POSI) Project's underground utilities component was completed in February 2020 and consisted of extending the existing protective casings around the Lanikai Gravity Sewer and the District's Secondary Effluent Force Main (B1) under the railroad tracks, as well as installation of a new, parallel, encased PVC gravity sewer line under the railroad tracks.

Additional capital repair history is provided in Table 8-1 below. There are no capital improvement projects contemplated at this time and the condition will be reassessed during the upcoming CCTV inspection.

TABLE 8-1
LANIKAI GRAVITY SEWER ASSET TRACKING

Date	Activity Type	Description
Dec-10	O&M	Hydroclean and CCTV Inspection resulted in recommendation to CIPP line eastern portion from Franciscan Rd to Occidental Line. Design completed and construction abandoned due to B2 break.
FY13	---	CIPP Project on hold due to B2 break
	Capital	Metallic manhole rings and cover were replaced with composite rings and covers
FY14/15	Capital	The portion from Franciscan to the Occidental manhole was lined as part of the B2 Replacement (approx. 385 ft).
2015	O&M	Hydrocleaned and CCTV Inspected
FY17	O&M	Hydrocleaned in Fall of 2016
FY20	Capital	Poinsettia Station Project- Included casing extension under existing railroad, new steel casing in parallel with the existing 24-inch SDR 26 PVC pipeline.
2022/2023	*O&M*	*Planned Hydrocleaning and CCTV Inspection (every 5 years)*

OCCIDENTAL SEWER

The 39-inch, 42-inch, and 48-inch Occidental Sewer is jointly-owned by the District, Carlsbad, and Encinitas. The District owns 40.3 percent of the facility, Carlsbad owns 40 percent, and Encinitas owns 19.7 percent. Carlsbad is responsible for the operation and maintenance of the Occidental Sewer. There are no planned improvements of the Occidental Line at this time.

5-YEAR CIP

There are no specific capital improvement projects included in the District's 5-Year CIP for jointly- owned gravity sewer facilities.

20-YEAR CAPITAL EXPENDITURE SUMMARY

Long-term capital replacement expenditures for the Batiquitos Influent Sewer are included in the District's overall gravity sewer pipeline 20-Year Summary of Capital Expenditures.

Capital replacement expenditures for the Lanikai and Occidental Sewer are based on the replacement value of the asset as calculated in Appendix L. The 20-year estimate of expenditures for the Lanikai Gravity Sewer is $240,000. The 20-year estimate of expenditures for the Occidental Line is $829,000. Note that these values represent only the District's share of these pipelines.

SUMMARY OF RECOMMENDATIONS

For financial planning, the District's share of the Lanikai Gravity Sewer expenditures is expected to total $240,000 over 20 years and for the Occidental Sewer, $829,000. The Batiquitos Influent Sewer is planned for in the overall District gravity pipelines replacement forecast.

CHAPTER 9

ENCINA WASTEWATER AUTHORITY

For the 5-Year CIP and long-range financial planning, this chapter develops the District's share of the Encina Wastewater Authority (Encina) facility replacement costs. These costs exclude the Encina Operating expenditures. This chapter also discusses historical Encina capital spending, as well as comparisons of Encina-projected versus Encina-actual expenditures. Finally, there is brief discussion regarding Encina's potential future reclamation efforts.

Historical Encina Expenditures

Table 9-1 presents a summary of the District's actual Encina Capital Costs over the last 9 fiscal years in actual dollars and 2023 dollars. Table 9-1 illustrates that the 5-year historical average of capital spending in 2023 dollars is approximately $3.9 million per year.

Table 9-2 provides a comparison of the Table 9-1 actual costs versus Encina's historical projections of costs (provided in Encina annual budgets between ECAMP cycles). This table illustrates that despite more frequent revisions to capital cost expenditures as part of annual budget preparation, the actual expenditures in recent years are consistently exceeding projected expenditures, whereas in prior years actual expenditures were less than projected.

TABLE 9-1
DISTRICT SHARE OF HISTORICAL
ENCINA CAPITAL COSTS

Year	Actual Dollars	$2023
2014	$ 1,096,852	$ 1,416,875
2015	$ 2,000,213	$ 2,526,488
2016	$ 1,030,495	$ 1,281,324
2017	$ 1,862,163	$ 2,219,624
2018	$ 2,709,496	$ 3,135,566
2019	$ 2,598,809	$ 2,975,778
2020	$ 3,861,059	$ 4,442,203
2021	$ 4,280,238	$ 4,560,614
2022	$ 4,280,359	$ 4,373,394
5-Year Average	**-**	**$ 3,897,511**

TABLE 9-2
DISTRICT SHARE OF ENCINA CAPITAL COSTS,
DETAILED PROJECTED ECAMP/BUDGET VERSUS ACTUAL
(in thousands of dollars)

2016 ENCINA ECAMP PROJECTION					
	FY2016	FY2017	FY2018	FY2019	FY2020
Total EWA Capital Improvement	$11,240	$11,826	$15,529	$15,348	$29,646
Adjusted EWA Projected Cost*	$11,399.45	$12,511.42	$16,921.80	$16,902.70	32,494.11
Projected District Share (16.8%)	$1,915.11	$2,101.92	$2,842.86	$2,839.65	$5,459.01
LWD Actual	$1,030	$1,862	$2,709	$2,599	$3,861
Actual % of Projected	***54***	***89***	***95***	***92***	***71***
2018 ENCINA BUDGET PROJECTION					
	FY2018	FY2019	FY2020	FY2021	FY2022
Total EWA Capital Improvement	$10,974	$17,646	$17,993	$11,491	$10,076
Adjusted EWA Projected Cost*	$10,973.50	$17,833.95	$18,098.36	$12,480.44	$11,412.41
Projected District Share (16.8%)	$1,843.55	$2,996.10	$3,040.52	$2,096.71	$1,917.28
LWD Actual	$2,709	$2,599	$3,861	$4,280	$4,280
Actual % of Projected	***147***	***87***	***127***	***204***	***223***
2020 ENCINA BUDGET PROJECTION					
	FY2020	FY2021	FY2022	FY2023	FY2024
Total EWA Capital Improvement	$17,594	$20,375	$14,912	$18,517	$21,632
Adjusted EWA Projected Cost*	$17,594.48	$22,000.53	$16,791.56	—	—
Projected District Share (16.8%)	$2,955.87	$3,696.09	$2,820.98	$3,110.86	$3,634.18
LWD Actual	$3,861	$4,280	$4,280	-	-
Actual % of Projected	***131***	***116***	***152***	***-***	***-***

*Adjusted using year end ENR for comparison against District actual.

Future Encina Expenditures

Table 9-3 presents EWA's planned 5-Year through 20-Year Capital Budget. Table 9-4 then presents the District's share of these costs as provided by Encina. For long-term financial planning, the District's share of Encina projects is estimated to be $132,630,913 over the next 20 years based on projections provided by Encina. For long-term future financial planning for the District, the five-year historical average will be utilized. With adjustments for inflation and the addition of District staff time, the financial plan assumption is anticipated to be approximately $4.2 million per year for a 20-year total of approximately $84 million.

TABLE 9-3
EWA CAPITAL PROJECT BUDGET,
ALL MEMBER AGENCIES FY24-FY43

Fiscal Year	Capital Improvements	Planned Asset Rehab & Replacement	Capital Acquisitions	Personnel Expense	Total
2024	20,545,000	1,534,200	541,000	3,277,522	25,897,722
2025	29,835,000	1,611,000	568,000	3,392,000	35,406,000
2026	27,970,000	1,692,000	596,000	3,511,000	33,769,000
2027	28,800,000	1,777,000	626,000	3,634,000	34,837,000
2028	29,700,000	1,866,000	657,000	3761,000	35,984,000
5 YEAR TOTAL	**136,850,000**	**8,480,200**	**2,988,000**	**17,575,522**	**165,893,722**
2029	30,600,000	1,959,000	690,000	3,893,000	37,142,000
2030	31,500,000	2,057,000	725,000	4,029,000	38,311,000
2031	32,400,000	2,160,000	761,000	4,170,000	39,491,000
2032	33,400,000	2,268,000	799,000	4,316,000	40,783,000
2033	34,400,000	2,381,000	839,000	4,467,000	42,087,000
10 YEAR TOTAL	**299,150,000**	**19,305,200**	**6,802,000**	**38,450,522**	**363,707,722**
2034-2038	164,500,000	13,814,000	4,868,000	24,789,000	207,971,000
2039-2043	164,500,000	17,636,000	6,215,000	29,440,000	217,791,000
20 YEAR TOTAL	**628,150,000**	**50,755,200**	**17,885,000**	**92,679,522**	**789,469,722**

Source: District Staff.

TABLE 9-4
PROJECTIONS OF LWD SHARE OF
EWA CAPITAL BUDGET

Fiscal Year	EWA Planned Total[1]	District Share, 16.8%	Financial Plan Assumption
2024	25,897,722	4,350,817	4,204,695
2025	35,406,000	5,948,208	4,204,695
2026	33,769,000	5,673,192	4,204,695
2027	34,837,000	5,852,616	4,204,695
2028	35,984,000	6,045,312	4,204,695
5 YEAR TOTAL	**$165,893,722**	**$27,870,145**	**$21,023,475**
2029	37,142,000	6,239,856	4,204,695
2030	38,311,000	6,436,248	4,204,695
2031	39,491,000	6,634,488	4,204,695
2032	40,783,000	6,851,544	4,204,695
2033	42,087,000	7,070,616	4,204,695
10 YEAR TOTAL	**$363,707,722**	**$61,102,897**	**$42,046,950**
2034-2038	207,971,000	34,939,128	21,023,475
2039-2043	217,791,000	36,588,888	21,023,475
20 YEAR TOTAL	**$789,469,722**	**$132,630,913**	**$ 84,093,900**

[1] Table 9-3

Encina Wastewater Authority Reclamation

Encina Wastewater Authority is in the exploratory process of implementing a water reclamation project to treat effluent from the treatment plant to potable water standards for potable sale/reuse ("Pure" water project). Cost projections for this project have not yet been prepared and are thus not included in the above costs.

SUMMARY OF RECOMMENDATIONS

1. For long-term financial planning purposes, the District's share of Encina capital costs is estimated to be approximately $84,000,000 over the next 20 years (approximately $4.2 million per year) and is based on a review of historical actual Encina capital costs to the District.

2. Incorporate Encina's potential future water reclamation project when costs are known.

CHAPTER 10

RECYCLED WATER FACILITIES

The District's recycled water facilities consist of the pump station at the Encina WPCF which pumps secondary effluent to the Gafner Water Reclamation Facility (WRF) via the force main B1 (also known as the fail-safe line). The Gafner WRF includes a reactor clarifier, a sand filter, and a chlorine contact basin, treating water to a tertiary level. The recycled water is then used for irrigation at the South La Costa Golf Course.

Additionally, the District is participating in the North San Diego Water Reuse Coalition, NSDWRC, formerly known as the North San Diego County Regional Recycled Water Project.

Secondary Effluent Pump Station at Encina WPCF

Recent improvements at the pump station include:

- FY16 – Rehabilitation of Pump #2
- FY15 – Rehabilitation of Pump #1 and upgrade to cellular telemetry
- FY12 – Update of radio alarm telemetry

The Secondary Effluent Pump Station was included in the 2014 Pump Station Assessment. Some of those recommendations were completed in FY15 and FY16. The outstanding recommendations are included in the Encina Secondary Effluent Pump Station Rehab Project (minor mechanical improvements, painting, and others).

Financial Planning. There is one specific pump station project identified in the 20-Year CIP to address rehabilitation of the station. The District could inspect portions of this pump station as part of the overall FY24 pump station condition assessment to confirm the project scope.

Secondary Effluent Force Main (B1)

The secondary effluent force main (B1) is from the secondary effluent pump station at Encina WPCF to the Gafner WRF. Sections of the force main have been replaced over time, as summarized in Table 10-1.

TABLE 10-1
B1 FORCE MAIN (FAIL-SAFE) HISTORY

YEAR	EVENT	Station Begin	Station End	Length, feet
	B1 installed	-	-	~24,000
2011	Partial replacement from the Batiquitos Pump Station to the San Marcos Creek Bridge. Force Main was replaced with 14-inch PVC.*	-	-	1,100
	Partial replacement from the San Marcos Creek Bridge to the north. Force Main was replaced with 14-inch PVC.*	-	-	400
2015	B1 Replacement from Lanakai to the north side of Batiquitos Lagoon. Force Main was replaced with 14-inch PVC. Replaced in the same trench as B2.	-	-	8,580
2016	Repair in northern most section of B1 with 16-inch PVC.	-	-	50
2023	Portion of force main within Encina property relocated into Avenida Encinas as 16-inch PVC. Runs south to existing PVC force main in south entrance to the Carlsbad Water Recycling Facility.	-	-	1,000

* Part of the 2010 Batiquitos Force Main Repair Project

Financial Planning. The remainder of the original segments of B1 are within La Costa Avenue and contemplated to occur in the last half of the 20-Year CIP. The estimated cost to line this pipeline is $2,530,000. This project may occur as part of the NSDWRC Regional Recycled Water Project or may be District-led.

Gafner Water Reclamation Facility

Recent improvements at the Gafner WRF include:

- FY18 – Upgrade project which included pump replacement, safety upgrades
- FY16 – IEC performed a condition assessment of the Gafner WRF
- FY15 – PLC replacement
- FY12 – Replaced two (2) Reclaimed Water Supply pumps and motors (for recycled water use onsite the Gafner WRF)
- FY11 – Replaced pumps and repainted Gafner facilities

Financial Planning. A condition assessment was conducted at Gafner WRF in 2016. The items requiring repair/upgrade were prioritized, with only some selected to implement, resulting in the FY18 Gafner AWT Improvement Project. The remaining items are included in the Phase 2 Gafner AWT Improvements Project. Based on the bid results of the FY18 project, the original construction cost estimate for the Phase 2 items was increased by a factor of 1.5 ($561,630/$368,000) to $1,221,075, calculated by $971,000 - $368,000 = $603,000 * 1.5 = $904,500 * 1.35 = $1,221,100; increasing by ENR, the project is estimated to cost $1,430,000.

Recycled Water Distribution

There are currently no projects planned in regards to recycled water distribution; all recycled water is sold to the South La Costa Golf Course.

North San Diego County Regional Recycled Water Project

The District is coordinating with ten other North County agencies on a combined recycled water project for the area known as the NSDWRC Regional Recycled Water Project. The project and the associated Feasibility Study (funded in part by LWD previously) are being used to apply for US Bureau of Reclamation Title XVI grant funds, San Diego Integrated Regional Water Management Proposition 84 grant funding, and Water Resources Reform and Development Act funding.

As part of this project, LWD received a $90,000 allocation of grant funding to design a recycled water pump station to deliver water from the Gafner WRF to the recycled water distribution system of the Olivenhain Municipal Water District. The preliminary design has been completed and the project has received the $90,000 reimbursement from the grant.

Future projects, the anticipated timing of the expenditure, and estimated total cost are provided in Table 10-2 below. These are unchanged from the 2018 Asset Management Plan.

TABLE 10-2
NSDWRC REGIONAL RECYCLED WATER PROJECT,
LWD EXPENDITURES

Description	Year	Cost	
Secondary Effluent Force Main (B1) Replacement	FY22	$3,132,700 * Construction Cost $4,229,145 Total Cost **	
Gafner WRF Tertiary Expansion	FY24	$1,537,000	$3,267,400 Subtotal Construction Cost $4,410,990 Subtotal Total Cost **
12-inch Pipeline Connection to OMWD	FY19	$290,400	
Recycled Water Distribution Pump Station at Gafner (prelim design complete)	FY23	$1,440,000	
TOTAL	—	$6,400,100 All Projects Construction Cost **$8,640,135 All Projects Total Cost**	

* DWEI Replacement Cost estimated at ~$5MM
** Construction Cost + 35% Soft Costs
Source: 2018 AMP

5-YEAR CAPITAL EXPENDITURE SUMMARY

Recycled water projects included in the 5-Year CIP include:

- FY23 SCADA upgrades at $3,000

20-YEAR CAPITAL EXPENDITURE SUMMARY

Recycled water projects included in the 20-Year CIP include:

- Encina Secondary Effluent Pump Station Rehabilitation Project at $440,000
- General Pump Station Improvements (based on long-term spending needs minus planned projects) at $1,320,000
- B1 Force Main – La Costa Replacement
- Gafner AWT Phase 2 Improvements at $1,430,000

Long-term capital replacement expenditures for the secondary effluent pump station and force main and Gafner WRF are expected to total approximately $12 million over the next 20 years. A portion of the funding, approximately $5 million, is for the pump station and force main. The remaining approximately $7 million is for the Gafner WRF. Dollar amounts beyond the specific CIP projects discussed above have not been included in the 5-Year CIP. Additionally, no long-term financial planning is provided at this time for the North San Diego County Recycled Water Project as it has yet to be approved.

SUMMARY OF RECOMMENDATIONS

1. The District should inspect portions of the Encina Secondary Effluent Pump Station as part of the overall FY24 pump station condition assessment to confirm the project scope.

2. Continue coordinating with other North County agencies on the North San Diego Water Reuse (NSDWR) Regional Recycled Water Project.

3. For long-term financial planning, District recycled water expenditures for pumpback facilities at Encina are estimated to total $5,018,000 over the next 20 years. The Gafner Water Reclamation Plant expenses are expected to total $6,698,000 over the next 20 years.

CHAPTER 11

5-YEAR CIP AND 20-YEAR SUMMARY OF CAPITAL EXPENDITURES

This chapter assembles all of the recommended CIP projects from prior chapters into the recommended CIP program. The complete list of projects, a brief description, and their associated costs are provided in Table 11-1.

DISTRICT 5-YEAR CIP

The District's 5-Year CIP is then provided in Table 11-2 on the following pages.

DISTRICT 20-YEAR SUMMARY AND DETAIL OF CAPITAL EXPENDITURES

The following Tables 11-3 and 11-4 present the summary of the estimated wastewater and recycled water program expenditures by asset class over the next 20 years (through FY2042). These values are calculated based on the long-term expenditures forecast for each asset category. The final table in this chapter, Table 11-5, presents the 20-Year projected CIP for integration with the District's Financial Plan.

TABLE 11-1
RECOMMENDED PROJECTS (20 Year CIP)

Location Code	Project Name	Project Overview	Detailed Project Description	CIP Project Cost (2022)	Cost Source
Gravity Pipelines and Manholes					
0382	FY23 Gravity Pipeline Rehab Project	CIPP Lining from RPL	CIPP Lining of 35 pipeline segments and installation of two new sewer manholes.	$682,000	Per FY23 Budget Appropriations
-	FY24 Gravity Pipeline Rehab Project	Items from RPL	Anticipated to be primary manholes. Estimated $585,000 construction cost with 35% soft costs.	$790,000	Based on 2018 AMP Value of $500k*35% for Soft
-	FY25 Gravity Pipeline Rehab Project	CIPP Lining from RPL	Estimated $585,000 construction cost with 35% soft costs.	$790,000	Based on 2018 AMP Value of $500k*35% for Soft
-	FY26 Gravity Pipeline Rehab Project	Open Trench from RPL	Estimated $585,000 construction cost with 35% soft costs.	$790,000	Based on 2018 AMP Value of $500k*35% for Soft
-	FY27 Gravity Pipeline Rehab Project	CIPP Lining from RPL	Estimated $585,000 construction cost with 35% soft costs.	$790,000	Based on 2018 AMP Value of $500k*35% for Soft
	Buildout-Capacity Based Projects			$0	
	General Long Term Pipeline Replacement Costs	Long-Term Implementation of RPL	Annual capital replacement planning for pipelines and manholes. Estimated $585,000 construction cost with 35% soft costs.	$790,000	FY23 Budget
Other Items					
0077	Misc. Pipeline/Manhole Rehab.	Miscellaneous Gravity System Repair	Budget allocation for miscellaneous projects. Yearly cost is presented in this table.	$205,000	FY23 Budget
	Headquarters Building	Estimated Annual Capital Replacement	Estimated capital repair costs for Headquarters and Out Buildings (HVAC, Roof, Elevator, IT, Painting, Carpet, Solar, etc.)	$32,333	Review with Staff to Determine Annual Cost. Robin to Discuss with Ryan & Ian.
	FY23 SCADA Upgrades	New Equipment at Headquarters	New Equipment at Headquarters	$70,000	FY23 Budget
	SCADA Upgrades	General SCADA Upgrades	Required upgrades every 5 years.	$85,000	Assumed
0368	Asset Management Plan Update	5-year Updates to District AMP		$150,000	
0323	Lateral Repl./Backflow Preventer Prog.	Continuation of District Program for Lateral Replacement	District program to aid customers with failing and damaged laterals. This project continues funding the program.	$100,000	FY23 Budget
Pump Stations					
0381	Village Park No. 7 PS Rehab Project	Pump Station Rehab/Replacement	Station constructed in 1973. Wet well lining on RPL also includes controls, some mechanical, electrical, and site work. Also, evaluate whether 480V service is possible.	$917,000	Per FY23 Budget Appropriations
0383	Rancho Verde Improvements	Pump Station Upgrades	Replace select mechanical, electrical, and site components including check valves, isolation valves, bypass piping, level controls, and site paving (among others). Also, evaluate whether 480V service is possible.	$1,247,400	2022 PDR Report+35% Soft
	Pump Station Condition Assessment	Inspect Pump Stations	Regularly Scheduled Condition Assessment Based on AMP Cycle	$50,000	Prior cost plus addition for expanded scope for Controls and Communication
0372	Diana PS Upgrade Project	Electrical Improvements	Site and install new emergency generator. Consider upgraded pumps.	$945,000	$450k from 2019 PSCA + $100k for Property + $50k for Conduit + $100k for Misc.+35% Soft
0384	Batiquitos Emergency/Overflow Basin	Overflow Inspection and Rehabilitation	This project consists of inspection of the emergency basin, currently budgeted at $34,500. Include lining/rehabilitation in overall Rehab project.	$35,000	2023 Budget
	Batiquitos Pump Station Rehabilitation	Pump and Generator Replacement, Near-Term Flood-proofing, and Emergency Basin Improvements	Replace 4 pumps with new pedestals and discharge header. Line Emergency Basin and install pump, new odor control, and HMP Near-term Flooding Proofing of doors, hatches, and vents.	$5,265,000	$790k pumps, $350k disch header, $570.5k Em. Basin lining, $100k E Basin air, $1.2M Em Basin pump, $290k generator, $250k odor, $250k Flood-proof, $100k Misc.+35% Soft
	La Costa Pump Station Replacement	Remove, Relocate, or Replace La Costa PS	Evaluate and implement either (1) remove via gravity improvements, (2) relocate as submersible station (consider parking lot or other), and/or (3) replace as submersible station. Electrical upgrades completed in FY12, pumps replaced in FY15, FY14 assessment recommended 2035 replacement.	$3,310,000	ENR from 2018 AMP
	Avocado Pump Station Upgrade	Pump and Miscellaneous PS Upgrades	Per 2019 IEC PSCA - Install conditioning pumps, improve vaults, electrical, lighting, add permanent standby generator.	$816,750	ENR from 2019 PS Condition Assessment - Pumps +35% Soft
	General Pump Station Improvements	General Pump Station Rehabilitation, expenditures, and Misc. Projects	Based on projected replacements. For years where CIP projects exist, CIP amount is subtracted from General Replacement Amount for that year. The amounts are averaged over five years. There should be enough here for capital acquisitions.Negative values are shown as 0.	-	Per Ch. 6 Estimated Costs

TABLE 11-1
RECOMMENDED PROJECTS (20 Year CIP)

Location Code	Project Name	Project Overview	Detailed Project Description	CIP Project Cost (2022)	Cost Source
Force Mains					
	L1 Testing	Destructive Testing of Metallic Sections of L1	Conduct desctructive testing of metallic section(s) of L1 to estimate condition and need to replace.	$300,000	Estimate
	L1 Inspection	Thorough Condition Assessment of L1	Installation of access points into forcemain to conduct thorough condition assessment to confirm condition of entire length and need to replace.	$500,000	Estimate
	L1 Final Replacement	Replace Remaining 1979 Force Main	From 2018 AMP "Current District Approach - Replace the 3 high points in 2021 and then delay replacing the remainder of L1. Store long-lead items at the District. Excavate and inspect low spots. Financial Model Approach - Replace remaining ~9,000 ft of original 1979 installation. Replacement costs for FY17 project were approx. $745/ft. Use same cost basis with multiplier of 0.5 to account for potential lining approach."	$3,360,000	ENR from 2018 AMP.
	B3 Testing	Destructive Testing of Metallic Sections of B3	Conduct desctructive testing of metallic section(s) of B3 to estimate condition and need to replace.	$300,000	Estimate
	B3 Inspection	Thorough Condition Assessment of B3	Installation of access points into forcemain to conduct thorough condition assessment to confirm condition of entire length and need to replace.	$500,000	Estimate
	B3 Rehab/Replace Project - Phase 2	Rehab/Replace remaining Metallic B3 Sections	IEC's 2011 evaluation recommended replacement in 2025. This is the second phase of the project to rehab/replace the remaining original ductile iron sections of B3. The first phase of the project which replaced the discharge end of the pipeline was completed in FY20. Includes evaluation in FY27.	$4,650,000	ENR from 2018 AMP.
	Batiquitos Partial Bypass	Leucadia to Batiquitos Forcemain		-	
2021 Hazard Mitigation Plan Improvements					
	Batiquitos Flood Proofing	Implementation of 2021 HMP - High Priority	Installation of flood-proof doors, ensuring all hatches are water tight, and flood-proofing vents.	$250,000	Est. Inluded in BAT Rehab Project
	Saxony Flood Protection	Implementation of 2021 HMP - High Priority	Provide flood protection for the electrical / control components at the Saxony Pump Station.	TBD	TBD
	Batiquitos and Saxony PS Flood Response and Contingency Plans	Implementation of 2021 HMP - High Priority	Non-capital Expense. Develop detailed site specific flood response and contingency plans Batiquitos and Saxony Pump Stations.	$0	TBD
	Batiquitos Long-Term Flood Proofing	Implementation of 2021 HMP - Long-Term	Evaluate more robust long-term flood-proofing solutions for the Batiquitos Pump Station, possibly including building a wall around the pump station (may be subject to political and environmental limitations) or relocation of the pump station.	TBD	TBD
	Saxony, La Cost,, and Leucadia Long-Term Sea Level Rise	Implementation of 2021 HMP - Long-Term	Evaluate elevating pump stations and emergency generators as they are rehabilitated or in new construction to account for potential sea level rise.	TBD	TBD
	Bridge Crossing Analysis	Implementation of 2021 HMP - Long-Term	Review detailed engineering analysis for the force mains at the railroad crossing and Pacific Coast Highway Bridge and L2 Force Main on the La Costa Avenue railroad bridge to ensure the design considered seismic hazards and follows good engineering practices (e.g., flexible restrained joints, lateral supports, anchorage redundancy, etc.).	$100,000	TBD
Jointly-Owned Gravity Sewers					
361	Poinsettia Station Gravity Pipeline Project (Lanikai)	Rehab of Railroad Crossing and Construction of Parallel Line	The extension of the protective casings around the Lanikai Gravity Trunk Sewer and (B1) and the construction of a parallel line to the Lanikai Gravity Sewer. This project is complete, but remains in the budget pending finalization of cost sharing among agencies.	$0	FY23 Budget
	General Lanikai Replacement (District Share)	General Maintenance and Replacement Costs	Estimated District's share of the yearly expenditures for replacement and maintenance of the Lanikai Gravity Sewer.	$20,000	ENR from 2018 AMP
	General Occidental Replacement (District Share)	General Maintenance and Replacement Costs	Estimated District's share of the yearly expenditures for replacement and maintenance of the Occidental Gravity Sewer.	$40,000	ENR from 2018 AMP
Encina					
0072	District Share of Encina CIP	District Share of Encina Capital Costs	Estimated District Share of Encina Capital Costs including CIP Projects and Acquisitions.	$84,093,900	Table 9-4
	IPR Evaluation	Planning Study	Evaluation of Indirect Potable Reuse Project	TBD	TBD
	IPR Implementation	Capital Project	Implementation of an Indirect Potable Reuse Project	TBD	TBD

TABLE 11-1
RECOMMENDED PROJECTS (20 Year CIP)

Location Code	Project Name	Project Overview	Detailed Project Description	CIP Project Cost (2022)	Cost Source
Recycled Water					
	FY23 SCADA Upgrades	New Equipment at Headquarters	New Equipment at Headquarters	$3,000	FY23 Op
	SCADA Upgrades	General SCADA Upgrades	Required upgrades every 5 years.	$5,000	Assumed
	Encina Secondary Effluent PS Rehab Project	Pump Station Rehab of Controls, Pumps, Electrical, and other Misc. Mechanical Items	2014 assessment had total cost estimate of $283,905 less cost for pumps ($100,000) and telemetry upgrade($4,000). Use DWEI Replacement Report for Controls, Elect., 50% Mech to cover miscellaneous mechanical, painting, and site improvements. Control update from Opto-22 to Allen Bradley required. Placeholder cost, verify rehab/replacement scope in FY19 assessment.	$440,000	ENR from 2018 AMP
	General Encina Secondary Effluent PS Improvements (less FM)	General Encina Secondary PS Expenditures	General Replacement Costs excluding FM which is included in Regional RW Project. Design is completed and project is being submitted for North San Diego Water Reuse Coalition Project.	$1,320,000	ENR from 2018 AMP
0367	B1 Force Main - North Section Replacement		Replacement of the first 860 feet of the force main from the pump station to just beyond the October 2016 failure point.	$728,000	FY23 Prior Plus Future Expenditures
	B1 Force Main - La Costa Replacement		Replacement of the remainder of the original segments of B1 within La Costa Avenue	$2,530,000	ENR from 2018 AMP
	Gafner AWT Improvements (Phase 2)	Remaining Improvements to Gafner WRF	Remaining items from 2016 condition assessment with costs increased relatively based on FY18 bid results in comparison to 2016 memo cost estimates.	$1,430,000	ENR from 2018 AMP
	General Gafner Improvements	General Maintenance and Replacement Costs	For Financial Planning, assume $350,000 per year beyond 5-Yr CIP.	$2,740,000	ENR from 2018 AMP
Optional Projects					
	No. SD County Regional RW Project	Expansion of District Recycled Water System	Remaining three of 4 projects - Gafner Expansion, OMWD connection, and new PS.	$5,150,000	
	Island Area Implementation - Eolus North	District Funded Island Area Project	Extension of the existing sewer in Eolus Ave. south to potentially connect 74 lots.	$1,840,000	
	Island Area Implementation - Eolus/Glaucus	District Funded Island Area Project	Extension of the existing sewer in Glaucus St. east to potentially connect 52 lots.	$1,360,000	
	Island Area Implementation - Naiad	District Funded Island Area Project	Extension of the existing sewer in Hymettus Ave. south to Naid St. potentially connect 47 lots.	$850,000	

TABLE 11-2
LEUCADIA WASTEWATER DISTRICT 5-YEAR CIP

Location Code	Project Name	FY2023	FY2024	FY2025	FY2026	FY2027
WASTEWATER PROGRAMS						
Gravity Pipelines and Manholes						
Specific Pipeline and Manhole Replacement/Rehabilitation Projects						
0382	FY23 Gravity Pipeline Rehab Project	$682,000	-	-	-	-
-	FY24 Gravity Pipeline Rehab Project	-	$790,000	-	-	-
-	FY25 Gravity Pipeline Rehab Project	-	-	$790,000	-	-
-	FY26 Gravity Pipeline Rehab Project	-	-	-	$790,000	-
-	FY27 Gravity Pipeline Rehab Project	-	-	-	-	$790,000
	Buildout-Capacity Based Projects	-	-	-	-	-
Subtotal Specific Pipeline and Manhole Replacement/Rehabilitation Projects		*$682,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*
General Pipeline and Manhole Replacement Projects		*$0*	*$0*	*$0*	*$0*	*$0*
Additional Pipeline and Manhole Projects						
0077	Misc. Pipeline/Manhole Rehab.	$205,000	$205,000	$205,000	$205,000	$205,000
	Headquarters Building	$32,333	$32,333	$32,333	$32,333	$32,333
	FY23 SCADA Upgrades	$70,000	-	-	-	-
	Future SCADA Upgrades	$0	$0	$0	$0	$0
0368	Asset Management Plan Update	$150,000	-	-	-	-
0323	Lateral Repl./Backflow Preventer Prog.	$100,000	$100,000	$100,000	$100,000	$100,000
Total Gravity Pipelines and Manholes		**$1,239,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**
Pump Stations and Force Mains						
Specific Pump Station Improvement Projects						
0381	Village Park No. 7 PS Replacement Project	$917,000	-	-	-	-
0383	Rancho Verde Improvements	$419,000	$828,400	-	-	-
	Pump Station Condition Assessment	-	$50,000	-	-	-
0372	Diana PS Upgrade Project	-	$236,250	$708,750	-	-
0384	Batiquitos Emergency/Overflow Basin	$34,500	-	-	-	-
	Batiquitos Pump Station Rehabilitation	-	$338,000	$2,807,500	$2,119,500	-
	La Costa Pump Station Replacement	-	-	-	-	-
	Avocado Pump Station Upgrade	-	-	-	-	-
Subtotal Specific Pump Station Projects		*$1,370,500*	*$1,452,650*	*$3,516,250*	*$2,119,500*	*$0*
Force Mains						
	L1 Destructive Testing	-	$300,000	-	-	-
	L1 Condition Inspection	-	-	-	$500,000	-
	L1 Final Replacement/Lining	-	-	-	-	-
	B3 Destructive Testing	-	-	-	-	$300,000
	B3 Condition Inspection	-	-	-	-	-
	B3 Rehab/Replace Project - Phase 2	-	-	-	-	-
	Batiquitos Partial Bypass	-	-	-	-	-
O+M	Annual Cathodic Protection	$4,500	$4,500	$4,500	$4,500	$4,500
	Anode Replacement	-	-	$30,000	-	-
Subtotal Specific Force Main Projects		*$4,500*	*$304,500*	*$34,500*	*$504,500*	*$304,500*
Subtotal of Specific Pump + Force Main Replacement Projects		**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**
General Pump Station Projects		*$0*	*$0*	*$0*	*$0*	*$0*
Total Pump Stations and Force Mains		**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**
2021 Hazard Mitigation Plan Improvements						
	Batiquitos Flood Proofing (Part of Upgrade Project)	-	-	-	-	-
	Saxony Flood Protection	-	-	-	-	-
	Batiquitos and Saxony PS Flood Response and Contingency Plans	-	-	-	-	-
	Batiquitos Long-Term Flood Proofing	-	-	-	-	-
	Saxony, La Costa and Leucadia Long-Term Sea Level Rise	-	-	-	-	-
	Bridge Crossing Analysis (L2 Flex Coupling)	-	-	-	-	-
Jointly-Owned Gravity Sewers						
0361	Poinsettia Station Gravity Pipeline Project (Lanikai)	$0	-	-	-	-
	General Lanikai Replacement (District Share)	$12,000	$12,000	$12,000	$12,000	$12,000
	General Occidenal Replacement (District Share)	$41,450	$41,450	$41,450	$41,450	$41,450
Subtotal HMP+ Jointly-Owned Gravity Sewers		**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**
Subtotal Wastewater Program (No Encina)		**$2,667,783**	**$2,937,933**	**$4,731,533**	**$3,804,783**	**$1,485,283**
Encina						
0072	District Share of Encina CIP	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695
	IPR Evaluation	-	-	-	-	-
	IPR Implementation	-	-	-	-	-
Total Wastewater Program		***$6,872,478***	***$7,142,628***	***$8,936,228***	***$8,009,478***	***$5,689,978***
RECYCLED WATER PROGRAM						
	FY23 SCADA Upgrades	$3,000	-	-	-	-
	SCADA Upgrades	-	-	-	-	-
	Encina Secondary Effluent PS Rehab Project	-	-	-	-	-
	General Encina Secondary Improvements (less FM)	-	-	-	-	-
0367	B1 Force Main - North Section Replacement	$728,000	-	-	-	-
	B1 Force Main - La Costa Replacement	-	-	-	-	-
	Gafner AWT Improvements (Phase 2)	-	-	-	-	-
	General Gafner Improvements	-	-	-	-	-
Total Recycled Water Program		***$731,000***	***$0***	***$0***	***$0***	***$0***
DISTRICT TOTAL CIP EXPENSES		**$7,603,478**	**$7,142,628**	**$8,936,228**	**$8,009,478**	**$5,689,978**

TABLE 11-3
20-YEAR SUMMARY OF
WASTEWATER CIP EXPENDITURES

Asset Category	Expenditures over 20 Years
Gravity Sewer Pipelines and Manholes	$ 23,363,660
Pump Stations and Force Mains	$ 47,846,335
Jointly-Owned Gravity Sewers	$ 1,069,000
Encina Wastewater Authority Projects	$ 84,093,900
TOTAL	**$ 156,372,895**

TABLE 11-4
20-YEAR SUMMARY OF
RECYCLED WATER CIP EXPENDITURES

Asset Category	Expenditures over 20 Years
Recycled Water Pump Station and Force Main	$ 5,036,000
Gafner Water Reclamation Plant	$ 6,680,000
North County Regional Recycled Water Project	$ 0
TOTAL	**$ 11,716,000**

TABLE 11-5
LEUCADIA WASTEWATER DISTRICT CAPITAL IMPROVEMENT PROGRAM - FINANCIAL ANALYSIS

Location Code	Project Name	Project Cost	20 Year Costs	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042
WASTEWATER PROGRAMS																							
Gravity Pipelines and Manholes																							
Specific Pipeline and Manhole Replacement/Rehabilitation Projects																							
0382	FY23 Gravity Pipeline Rehab Project	$682,000	$682,000	$682,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY24 Gravity Pipeline Rehab Project	$790,000	$790,000	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY25 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY26 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FY27 Gravity Pipeline Rehab Project	$790,000	$790,000	-	-	-	-	$790,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Buildout-Capacity Based Projects	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Specific Pipeline and Manhole Replacement/Rehabilita		*$3,992,000*	*$3,842,000*	*$682,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
General Pipeline and Manhole Replacement Projects		*$790,000*	*$11,850,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*	*$790,000*
Additional Pipeline and Manhole Projects																							
0077	Misc. Pipeline/Manhole Rehab.	$205,000	$4,100,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000	$205,000
	Headquarters Building	$32,333	$646,660	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333	$32,333
	FY23 SCADA Upgrades	$70,000	$70,000	$70,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Future SCADA Upgrades	$85,000	$255,000	$0	$0	$0	$0	$0	$85,000	$0	$0	$0	$0	$85,000	$0	$0	$0	$0	$85,000	$0	$0	$0	$0
0368	Asset Management Plan Update	$150,000	$600,000	$150,000	-	-	-	-	$150,000	-	-	-	-	$150,000	-	-	-	-	$150,000	-	-	-	-
0323	Lateral Repl./Backflow Preventer Prog.	$100,000	$2,000,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Total Gravity Pipelines and Manholes		**$5,424,333**	**$23,363,660**	**$1,239,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,362,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**	**$1,127,333**
Pump Stations and Force Mains																							
Specific Pump Station Improvement Projects																							
0381	Village Park No. 7 PS Replacement Project	$917,000	$917,000	$917,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0383	Rancho Verde Improvements	$1,247,400	$1,247,400	$419,000	$828,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pump Station Condition Assessment	$50,000	$50,000	-	$50,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0372	Diana PS Upgrade Project	$945,000	$945,000	-	$236,250	$708,750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0384	Batiquitos Emergency/Overflow Basin	$34,500	$34,500	$34,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos Pump Station Rehabilitation	$5,265,000	$5,265,000	-	$338,000	$2,807,500	$2,119,500				-	-	-	-	-	-	-	-	-	-	-	-	-
	La Costa Pump Station Replacement	$3,310,000	$3,310,000	-	-	-	-	-	$3,310,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Avocado Pump Station Upgrade	$816,750	$816,750	-	-	-	-	-	-	-	$816,750	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Specific Pump Station Projects		*$12,585,650*	*$12,585,650*	*$1,370,500*	*$1,452,650*	*$3,516,250*	*$2,119,500*	*$0*	*$3,310,000*	*$0*	*$816,750*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
Force Mains																							
	L1 Destructive Testing	$300,000	$300,000	-	$300,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1 Condition Inspection	$500,000	$500,000	-	-	-	$500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	L1 Final Replacement/Lining	$3,360,000	$3,360,000	-	-	-	-	-	-	-	-	$1,680,000	$1,680,000	-	-	-	-	-	-	-	-	-	-
	B3 Destructive Testing	$300,000	$300,000	-	-	-	-	$300,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B3 Condition Inspection	$500,000	$500,000	-	-	-	-	-	-	$500,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	B3 Rehab/Replace Project - Phase 2	$4,650,000	$4,650,000	-	-	-	-	-	-	-	-	-	-	$2,325,000	$2,325,000	-	-	-	-	-	-	-	-
	Batiquitos Partial Bypass	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Annual Cathodic Protection	Misc.	$47,500	$4,500	$4,500	$4,500	$4,500	$4,500	$5,000	$5,000	$5,000	$5,000	$5,000	-	-	-	-	-	-	-	-	-	-
	Anode Replacement	$30,000	$180,000	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-	-	$30,000	-	-	$30,000	-	-	$30,000	-	-
Subtotal Specific Force Main Projects		*$9,880,000*	*$9,837,500*	*$4,500*	*$304,500*	*$34,500*	*$504,500*	*$304,500*	*$35,000*	*$505,000*	*$5,000*	*$1,715,000*	*$1,685,000*	*$2,325,000*	*$2,355,000*	*$0*	*$0*	*$30,000*	*$0*	*$0*	*$30,000*	*$0*	*$0*
Subtotal of Specific Pump + Force Main Replacement Projects			*$22,423,150*	**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**	**$3,345,000**	**$505,000**	**$821,750**	**$1,715,000**	**$1,685,000**	**$2,325,000**	**$2,355,000**	**$0**	**$0**	**$30,000**	**$0**	**$0**	**$30,000**	**$0**	**$0**
General Pump Station Projects		*$750,000*	*$25,423,185*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$4,514,400*	*$2,953,125*	*$2,923,125*	*$2,953,125*	*$2,953,125*	*$2,923,125*	*$3,116,580*	*$3,086,580*
Total Pump Stations and Force Mains		**$23,215,650**	**$47,846,335**	**$1,375,000**	**$1,757,150**	**$3,550,750**	**$2,624,000**	**$304,500**	**$3,345,000**	**$505,000**	**$821,750**	**$1,715,000**	**$1,685,000**	**$2,325,000**	**$2,355,000**	**$4,514,400**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$2,953,125**	**$3,116,580**	**$3,086,580**
2021 Hazard Mitigation Plan Improvements																							
	Batiquitos Flood Proofing (Part of Upgrade Project)	$250,000	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Saxony Flood Protection	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos and Saxony PS Flood Response and Conti	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Batiquitos Long-Term Flood Proofing	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Saxony, La Costa and Leucadia Long-Term Sea Level	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bridge Crossing Analysis (L2 Flex Coupling)	$100,000	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jointly-Owned Gravity Sewers																							
0361	Poinsettia Station Gravity Pipeline Project (Lanikai)	$0	$0	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Lanikai Replacement (District Share)	$12,000	$240,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000
	General Occidenal Replacement (District Share)	$41,450	$829,000	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450	$41,450
Subtotal HMP+ Jointly-Owned Gravity Sewers		**$403,450**	**$1,069,000**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**	**$53,450**
Subtotal Wastewater Program (No Encina)		**$29,043,433**	**$72,278,995**	**$2,667,783**	**$2,937,933**	**$4,731,533**	**$3,804,783**	**$1,485,283**	**$4,760,783**	**$1,685,783**	**$2,002,533**	**$2,895,783**	**$2,865,783**	**$3,740,783**	**$3,535,783**	**$5,695,183**	**$4,133,908**	**$4,133,908**	**$4,368,908**	**$4,133,908**	**$4,133,908**	**$4,297,363**	**$4,267,363**
Encina																							
0072	District Share of Encina CIP	$4,204,695	$84,093,900	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695	$4,204,695
	IPR Evaluation	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	IPR Implementation	TBD	$0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Wastewater Program		***$29,043,433***	***$156,372,895***	***$6,872,478***	***$7,142,628***	***$8,936,228***	***$8,009,478***	***$5,689,978***	***$8,965,478***	***$5,890,478***	***$6,207,228***	***$7,100,478***	***$7,070,478***	***$7,945,478***	***$7,740,478***	***$9,899,878***	***$8,338,603***	***$8,338,603***	***$8,573,603***	***$8,338,603***	***$8,338,603***	***$8,502,058***	***$8,472,058***
RECYCLED WATER PROGRAM																							
	FY23 SCADA Upgrades	$3,000	$3,000	$3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SCADA Upgrades	$5,000	$15,000	-	-	-	-	-	$5,000	-	-	-	-	$5,000	-	-	-	-	$5,000	-	-	-	-
	Encina Secondary Effluent PS Rehab Project	$440,000	$440,000	-	-	-	-	-	-	$440,000	-	-	-	-	-	-	-	-	-	-	-	-	-
	General Encina Secondary Improvements (less FM)	$1,320,000	$1,320,000	-	-	-	-	-	-	-	$1,320,000	-	-	-	-	-	-	-	-	-	-	-	-
0367	B1 Force Main - North Section Replacement	$728,000	$728,000	$728,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B1 Force Main - La Costa Replacement	$2,530,000	$2,530,000	-	-	-	-	-	-	-	-	-	-	$2,530,000	-	-	-	-	-	-	-	-	-
	Gafner AWT Improvements (Phase 2)	$1,430,000	$1,430,000	-	-	-	$0	-	-	-	-	$1,430,000	-	-	-	-	-	-	-	-	-	-	-
	General Gafner Improvements	$350,000	$5,250,000	-	-	-	-	-	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000	$350,000
Total Recycled Water Program		***$6,806,000***	***$11,716,000***	***$731,000***	***$0***	***$0***	***$0***	***$0***	***$355,000***	***$790,000***	***$1,670,000***	***$1,780,000***	***$350,000***	***$2,885,000***	***$350,000***	***$350,000***	***$350,000***	***$350,000***	***$355,000***	***$350,000***	***$350,000***	***$350,000***	***$350,000***
DISTRICT TOTAL CIP EXPENSES		**$35,849,433**	**$168,088,895**	**$7,603,478**	**$7,142,628**	**$8,936,228**	**$8,009,478**	**$5,689,978**	**$9,320,478**	**$6,680,478**	**$7,877,228**	**$8,880,478**	**$7,420,478**	**$10,830,478**	**$8,090,478**	**$10,249,878**	**$8,688,603**	**$8,688,603**	**$8,928,603**	**$8,688,603**	**$8,688,603**	**$8,852,058**	**$8,822,058**