



CITY OF DAVIS

2022 WASTEWATER RATE STUDY

*Draft Financial Plan & Cost of Service Report
December 10, 2021*



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INDEPENDENT PUBLIC FINANCE ADVISORS

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Introduction & Background

The City has retained Bartle Wells Associates (BWA) to conduct a wastewater rate study which examines current and projected costs and the existing wastewater rate structure as it pertains to California legislation.

The City's wastewater system is a self-sustaining enterprise, meaning revenues (mostly sourced from wastewater rates) aim to recover the cost to operate and maintain the wastewater system. Primary cost factors impacting wastewater rates include ongoing debt service requirements and the significant cost of capital improvements to repair aging infrastructure.

Basic objectives of the rate study include:

- Develop long-term financial projections for the wastewater enterprise including operations, maintenance, debt, and capital improvement costs
- Determine rate revenue requirement sufficient to provide service and generate adequate funding for capital needs.
- Conduct a cost-of-service study to determine the ratepayer share of expenses attributable to each customer class.
- Recommend wastewater rates designed to equitably recover the costs of providing service according to Proposition 218

Based on input from City staff, key guiding principles included developing rates that:

- Are fair and equitable to all customer classes.
- Recover the costs of providing service and generate adequate funding for capital needs.
- Are easy to understand and implement.
- Comply with the legal requirements of Proposition 218 and other California laws

Proposition 218

Utility rates are subject to the procedural and substantive requirements as set forth in Proposition 218. Proposition 218 was adopted by California voters in 1996 and added Articles 13C and 13D to the California Constitution. Article 13D, Section 6 governs property-related charges, which the California Supreme Court subsequently ruled includes ongoing utility service charges such as water and wastewater. Article 13D, Section 6 establishes a) procedural requirements for imposing or increasing property-related charges, and b) substantive requirements for those charges. Article 13D also requires voter approval for new or increased property-related charges but exempts from this voting requirement rates for water and wastewater service. The substantive requirements of Article 13D, Section 6 require the City's utility rates to meet the following conditions:

- Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.
- Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.

- The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.
- No fee or charge may be imposed for a service unless that service is used by, or immediately available to, the owner of the property in question.
- No fee or charge may be imposed for general governmental services, such as police or fire services, where the service is available to the public at large in substantially the same manner as it is to property owners.

The procedural requirements of Proposition 218 for all utility rate increases are as follows:

- **Noticing Requirement:** The City must mail a notice of proposed rate increases to all affected property owners. The notice must specify the basis of the fee, the reason for the fee, and the date/time/location of a public rate hearing at which the proposed rates will be considered/adopted.
- **Public Hearing:** The City must hold a public hearing prior to adopting the proposed rate increases. The public hearing must be held not less than 45 days after the required notices are mailed.
- **Rate Increases Subject to Majority Protest:** At the public hearing, the proposed rate increases are subject to majority protest. If 50% plus one of affected property owners submit written protests the proposed rate increases, the increases cannot be adopted.

Use of Generally Accepted Rate-Making Principles

The California Constitution does not allow agencies to arbitrarily set rates purely based on policy preferences. Instead, it provides agencies with flexibility to implement rates within a cost-of-service framework established by Proposition 218. The rates developed in this report are designed to achieve the City's policy preferences while complying with the requirements of the California Constitution.

The rates developed in this study use a straightforward methodology to establish an equitable system of fixed and variable charges that recover the cost of providing wastewater service and fairly apportion costs, first to fixed/variable cost components, and then to account, flow and strength cost components. All cost allocations align with the framework of California legal requirements and industry standard ratemaking practices. The rates were developed using generally accepted cost-based principles and methodologies for establishing wastewater rates, charges, and fees.

BWA used the following criteria when developing our recommendations for the City's wastewater rates and finances:

- 1) *Revenue Sufficiency:* Rates should recover the annual cost of service and provide revenue stability.
- 2) *Rate Impact:* While rates are calculated to generate sufficient revenue to cover operating and capital costs, they should be designed to minimize, as much as possible, the impacts on ratepayers.
- 3) *Equitability:* Rates should be fairly allocated among all customer classes based on their estimated demand characteristics. Each user class only pays its proportionate share.
- 4) *Practicality:* Rates should be simple in form and, therefore, adaptable to changing conditions, easy to administer, and easy to understand.

Financial Plan and Projected Revenue Requirements

Financial Plan Overview

BWA developed multi-year financial plan projections through 2039/40 to review the long-term financial condition of the wastewater enterprise and estimate annual revenue requirements to fund operating, debt and capital expenditures.

Bartle Wells Associates conducted an independent evaluation of the City's wastewater enterprise finances. Key observations are summarized as follows:

- As a self-supporting enterprise fund, the majority of revenues are derived from wastewater service charges (rates). Wastewater rates were last increased in July of 2017. Annual rate revenue totaled approximately \$13.6 million in FY 2020, or about 1.25x annual operating expenditures.
- The wastewater enterprise has annual debt service payments totaling about \$2.1 million on one loan issued in 2014.
- The current Capital Improvement Plan, which addresses aging infrastructure and other needed improvements, totals \$19.6 million over the next 5 years. The 20-year capital program totals \$44.8 million: Funding for each capital improvement project has been evaluated to determine the appropriate funding mechanism (cash or debt financing).
- Wastewater expenses were projected over the next 20 years based on historical audits, 2020/21 budget, and financial projections provided by the City. Projected expenses and minimum reserve fund targets were used to develop annual rate revenue requirements in the 20-year period.
- Within the 5-year rate structure recommendations in this study, the City will need to increase rates on an annual basis to meet the cost of wastewater service. The primary cost factor impacting wastewater rates is the significant capital improvement costs faced by the enterprise fund.

This section details the revenue and expenditure assumptions used to project the wastewater utility's expenditures and determine the proposed annual rate revenue requirements. Detailed financial projections are provided in the Appendix of this report.

Current Rates

The existing wastewater rates are based on a traditional rate structure which includes a fixed base rate for all users, a flat per unit charge for residential customers, and volumetric charges based on estimated sewer demand and effluent strength for each customer class in hundred cubic foot (ccf) units.

Residential Sewer Rates

Single family homes, multi-family apartments and mobile home park customers are billed each month according to three rate categories: a fixed base rate reflecting administrative costs, a fixed per unit charge based on dwelling unit size, and a volumetric charge based on winter water use (November – March) in the prior year. Average winter water use is used to estimate sewer flow, where water used for irrigation that does not impact the sewer system cannot be determined from a customer with a single meter for both purposes. Average winter water use is capped at 24 units for a single-family home to avoid any irrigation use in wintertime. Non-single-family customers have reduced fixed per-unit charges and a lower cap on monthly average winter water use, reflecting a lower sewer demand from these customer classes.

Non-Residential Sewer Rates

Commercial customers are billed a monthly fixed base rate that recovers administrative expenses, and volumetric charges based on monthly average winter wastewater usage (per ccf) in the prior year. Commercial users do not face a fixed charge but pay higher volumetric rates to reflect the total commercial portion of rate revenues. Volumetric rates are charged according to seven customer classes (C1-C7) based on the sewer demand and strength for various commercial use categories.

The City's current wastewater rates are summarized in Table 1 below.

Table 1 – Current Rates

Rates Effective	7/1/2017
Base Rate - Monthly \$/account, all users	
Base Rate	\$3.94
Monthly Per Unit Rate (\$/dwelling unit, residential only)	
Single Family	18.26
Multi Family	
Condominium	12.46
Duplex	14.22
3 Units	15.02
4 Units	15.32
5+ Units	12.88
Mobile Home	12.85
Volumetric Rate (\$/ccf* by customer class)	
Single Family Residential	\$3.13
Commercial	
C-1 Office, Retail, Motels	\$4.53
C-2 Laundry, Dry Cleaning	\$4.69
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69
C-4 Convalescent Hospital	\$4.96
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33
C-6 Restaurants / Fast Food	\$8.12
C-7 Industrial	\$6.74
*ccf is equal to average monthly winter wastewater use from November - February of prior year	
Monthly Sewer Cap (maximum monthly ccf billable, by customer class)	
Single Family	24
Multi Family	
Condo	19
Duplex	36
Triplex	56
Quadplex	76
5+ units	19 ccf/unit
Mobile Home Park	19 ccf/unit

Current Wastewater Fund Revenues

The wastewater enterprise has multiple sources of revenue, including wastewater rates, capacity fees, interest earnings, and "other revenues". BWA evaluated current and projected revenues as summarized below:

- Rate Revenues:** Revenues from wastewater rates were derived from the fixed base, per unit, and volumetric wastewater rates paid by customers. In FY 2020/21 the City is projected to receive \$13.6 million in rate revenue from customers inside the City. Rate revenues currently represent 91 percent of the utility's total revenues. Future annual wastewater rate revenues are projected based on the required revenue increases, with adjustments made for customer growth estimated to be 0.5% per year.

Current rate revenues are summarized on Table 2

Table 2 – Current Wastewater Rate Revenues

	Base Rates	Per Unit Rates	Volumetric Rates*	Total Revenue
**Inside City Revenue	\$746,602	\$5,102,432	\$7,751,049	\$13,600,084
Total Rate Revenue	\$762,034	\$5,207,893	\$7,911,253	\$13,881,179

**Reflects prior year average winter water use, November 2018 - February 2019. Residential users subject to usage cap*

***Does not include irrigation accounts or city accounts inside the City, El Macero and North Davis Meadows accounts outside city (billed separately)*

Current fixed rates (including base rates and per unit rates) currently represent about 43% of total rate revenues. Volumetric rates generate the remaining 57% of rate revenues. The City has a relatively high volumetric rate structure, which can produce revenue instability, especially in recent times of drought.

Investment Earnings: Interest is earned on wastewater utility reserve funds and other investments. For fiscal year 2020/21, investment earnings are estimated to be \$445,390. Investment earnings projections were estimated based on the current market rate of 2 percent.

- Capacity Fees:** The City is projected to receive \$200,000 in capacity fee revenue from new connections in 2021-22. Capacity fee revenue projections were calculated based on the City's current capacity fees and projected new development through FY 2040. The City's current capacity fee is \$6,150 for a typical single family residential wastewater connection. Other fees are assigned EDU ratings according to their estimated demand in single family Equivalent Dwelling Units (EDUs). Fees are increased annually for inflation, approximately 3.0% per year. New development was projected based on assumed growth of 0.5% per year.
- Other Revenues:** These revenues include sewer service fees, maintenance fees, pretreatment fees, and land lease revenues. Revenues in this "other revenue" category are expected to be \$353,298 and are projected based on assumed inflation of 0.5% per year.

Wastewater Reserve Fund Balance

As of July 1, 2020, the wastewater enterprise held \$25.3 million in operations, capital, and expansion reserve funds as shown in Table 3.

Fund	Description	6/30/2019
531	Operations	\$3,338,163
532	Capital Replacement	\$20,868,572
533	Capital Expansion	\$1,070,164
Total Wastewater Fund Balance - Working Capital		\$25,276,899

Reserve Fund Balance Policies

Maintaining a prudent minimal level of fund reserves provides a financial cushion for dealing with unanticipated expenses, revenue shortfalls, debt requirements, and emergency capital repairs. The financial plan was designed to meet the following fund balance targets:

- **Wastewater Operations:** The City shall maintain a reserve balance of at least 3-months annual operating cost.
- **Capital Replacement Fund:** Target reserve shall be the average of the planned expenditures in the 5-year CIP.
- **Rate Stabilization:** Target reserve shall be 10% of annual operating revenue for wastewater.
- **Debt funds held as required:** one year of debt service payments.

In addition to the reserve policy, the City holds debt funds as required. The City is legally required to abide by debt service covenants on each bond and must raise wastewater rates as needed to achieve a minimum of 110% coverage on annual debt service. In other words, annual net revenues (total revenues less total operations and maintenance expenses) must be at least 110% of combined annual debt service payments on all parity (i.e., first-lien) wastewater obligations. Coverage ratios are a financial measure of the wastewater utility's ability to repay outstanding debt and are a standard legal covenant for securing wastewater revenue bonds or similar debt financing. BWA has ensured that the City maintains a minimum 110% debt service coverage ratio each year of the financial plan.

Based on 2019-20 budget expenditures, the total minimum reserve fund for the wastewater enterprise is \$11.8 million.

Baseline Operating Expenses

Operations and maintenance costs are expenditures that the City incurs in the daily operations of the wastewater system. Operations and Maintenance costs are estimated to be \$10.5 million in 2020-21. BWA projected the annual wastewater operating expenditures according to City-provided estimates of labor costs, chemicals, treatment fees, and other expenditures. The wastewater operations fund faces an average overall cost increase of 3% per year through FY 2040. Detailed operating cost projections can be found in the Appendix.

Capital Improvement Plan

City staff developed a 20-year schedule of necessary capital improvement projects through FY 2040, including projects for the ongoing repair and replacement of wastewater system infrastructure, wastewater treatment projects, and ongoing annual repair and replacement. These projects are necessary for the long-term sustainability and integrity of the wastewater system.

The 5-year Capital Improvement Plan has a total project cost of \$19.6 million in current dollars. BWA has included a 3% annual inflation factor per year to reflect the average annual change in construction costs, resulting in a 5-year CIP total of \$21.2 million. Inflation-adjusted CIP costs are summarized in Table 4.

Table 4 – Five Year Wastewater CIP Summary

	2021-22	2022-23	2023-24	2024-25	2025-26
Total CIP Project Cost (Inflation-Adjusted)	\$4,834,000	\$3,990,000	\$7,170,000	\$2,040,000	\$2,790,000

The detailed 20-year Capital Improvement Plan is provided in the Appendix.

Current Debt Service

The wastewater enterprise pays annual debt service on one loan, issued by the State Revolving Fund (SRF) loan in December 2014 to pay for Davis Wastewater Treatment Plant Secondary and Tertiary Improvement projects and meet the City's future wastewater treatment needs. Annual debt service payments for this loan are shown on Table 5:

Table 5 – Summary of Debt Service Payments

	Total Annual Payment
SRF Loan - WWTP 8010	\$2,086,828

Cash Flow Projection

BWA developed 5-year and 20-year cash flow projections to summarize the current and projected revenue and expenditures discussed in this report and evaluate the need for wastewater rate revenue adjustments. The 5-year cash flow projection, including proposed rate adjustments, is provided in Table 6.

Table 6 – Five Year Wastewater Cash Flow Projection

Projection	Budget	1	2	3	4	5
Fiscal Year	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Effective Date		5/1/22	5/1/23	5/1/24	5/1/25	5/1/26
Months Effective		2	2	2	2	2
Proposed Rate Revenue Increase		5.0%	5.0%	5.0%	5.0%	5.0%
Growth		0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$25,276,899	\$15,892,704	\$13,856,193	\$13,104,936	\$9,326,416	\$11,698,721
REVENUE						
Operating Revenue						
Wastewater Rate Revenue*	\$13,881,179	\$14,648,114	\$15,457,423	\$16,311,445	\$17,212,653	\$18,163,652
All Other Operating Revenue	\$353,298	\$355,064	\$356,840	\$358,624	\$360,417	\$362,219
Total Operating Revenue	\$14,234,477	\$15,003,179	\$15,814,262	\$16,670,069	\$17,573,070	\$18,525,871
Non- Operating Revenue						
Total Investment Income	\$455,390	\$461,254	\$467,204	\$473,239	\$479,362	\$485,574
Capacity Fees	\$200,000	\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262
All Other Non-Operating Revenue	\$0	\$0	\$0	\$0	\$0	\$0
Total Non-Operating Revenue	\$655,390	\$1,453,927	\$1,489,657	\$1,526,366	\$1,564,083	\$1,602,836
TOTAL REVENUE	\$14,889,867	\$16,457,106	\$17,303,919	\$18,196,435	\$19,137,152	\$20,128,707
EXPENDITURES						
Operating Expenses						
Total Salaries and Wages	\$2,173,451	\$2,222,354	\$2,272,357	\$2,323,485	\$2,375,763	\$2,429,218
Total Personnel Costs	\$2,639,274	\$3,494,206	\$3,629,769	\$3,771,861	\$3,920,858	\$4,077,159
Other Resources	\$5,591,802	\$5,711,209	\$5,833,232	\$5,957,929	\$6,085,361	\$6,215,589
Total Operating Expenses	\$10,404,527	\$11,427,769	\$11,735,357	\$12,053,274	\$12,381,981	\$12,721,966
Non-Operating Expenses						
Total CIP	\$11,782,707	\$4,979,020	\$4,232,991	\$7,834,853	\$2,296,038	\$3,234,375
Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$13,869,535	\$7,065,848	\$6,319,819	\$9,921,680	\$4,382,866	\$5,321,203
TOTAL EXPENDITURES	\$24,274,062	\$18,493,617	\$18,055,176	\$21,974,955	\$16,764,847	\$18,043,168
Net Revenue	(\$9,384,195)	(\$2,036,511)	(\$751,257)	(\$3,778,520)	\$2,372,305	\$2,085,539
Ending Fund Balance	\$15,892,704	\$13,856,193	\$13,104,936	\$9,326,416	\$11,698,721	\$13,784,260
Fund Balance Target	\$11,363,025	\$9,830,536	\$9,622,343	\$9,405,553	\$8,915,481	\$9,004,249
Debt Service Coverage	1.84	1.71	1.95	2.21	2.49	2.78

*Rate revenue from service charges based on Table S2 calculated revenue

Rate Revenue Requirements

The 5-year cash flow projection indicates that the City will need 5% annual increases to wastewater rate revenue to accomplish the following:

- Complete annual operations and Capital Improvement Plan funding
- Minimum fund balance targets
- Minimum debt service coverage of 110% net operating revenues

BWA recommends that the City implement the proposed rate increases on May 1 of each year (or as soon after as possible), beginning May 1, 2022.

The 5-year schedule of rate revenue requirements is shown on Table 7.

Table 7 – 5-Year Wastewater Cash Flow Projection: Proposed Rate Revenue Requirements

Fiscal Year	FY 2021-22	2022-23	2023-24	2024-25	2025-26
Adoption Date	5/1/22	5/1/23	5/1/24	5/1/25	5/1/26
Effective Months	2	2	2	2	2
Revenue Increase	5.0%	5.0%	5.0%	5.0%	5.0%
Projected Rate Revenues	\$14,648,114	\$15,457,423	\$16,311,445	\$17,212,653	\$18,163,652

Please find additional details and 20-year cash flow projections in the Appendix tables attached.

Cost of Service Study

In addition to the proposed increases, Bartle Wells Associates recommends that the City make changes to the current rate structure to align with the latest cost of service. The recommended rates ensure compliance with the requirements set forth in Proposition 218, equality between customer classes, and provide greater security of revenue collection.

BWA conducted a comprehensive cost of service analysis of the City's wastewater enterprise expenses first to fixed/variable cost components, and second to account, flow and strength cost components. Costs were analyzed in the base year FY 2020-21, or the first year of the proposed rate schedule, for inside City customers only.

System Demand Factors

First, costs were allocated to major demand factors that impact the Wastewater System. Cost components include:

1. Number of Accounts
2. Total Flow (shown as million gallons per day, or mgd)
3. Biochemical Oxygen Demand (BOD, shown as total lbs/day)
4. Total Suspended Solids (TSS, shown as total lbs/Day)
5. Ammonia (N, shown as mg/L)

The FY 2020-21 revenue requirement was allocated to account, flow, BOD TSS, and Ammonia cost components as shown on Table 8.

Table 8 –2021 Cost Allocation Summary

	% CS	% Flow	% BOD	% TSS	% Ammonia	Total
% Cost Allocation*	6%	61%	15%	15%	2%	100%
\$ Revenue Requirement	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,419	\$13,600,084

*Inside City rate revenues only, see Table 2

BWA used average system data from FY 2016-FY 2020 as the assumed demand factors for the cost of service study. Demand factors are summarized in Table 9.

Table 9 – Summary of 2021 Billable Units

Cost Component	Billable Units
Accounts	15,781
Flow (mg)	2,242,430
BOD (lbs/Yr)	2,211,348
TSS (lbs/yr)	2,529,885
Ammonia (total N)	250

Unit rates were developed by dividing the rate revenue allocation by the demand factor for each cost component (account, flow, BOD, TSS, Ammonia). Unit rates should be used in any case where a customer's wastewater is tested on a regular basis, or they exceed the strength assumptions in the City's defined customer classes. Unit rates are calculated in Table 10 below.

Table 10 - 2021 COS Proposed Unit Rates

	Customer Service	Flow	BOD	TSS	Ammonia
Total Cost Allocation	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,419
Billable Units	15,781	2,242,430	2,211,348	2,529,885	250
\$/Unit	\$4.05	\$3.72	\$0.94	\$0.82	\$1.36

A detailed cost allocation summary, including two alternative cost of service allocation scenarios, can be found in the Appendix Tables.

Fixed Rates

Proposed Fixed Charges

Customer Classes and Billing Units

Fixed rates include account-based rates and flow-based per dwelling unit charges (for residential customers only). Account data is assumed to be constant from FY 2019, while residential flow data reflects billable water use for each customer class.

A summary of wastewater customer data assumed for the fixed rate calculation (including adjustments to the fixed per-dwelling-unit customer classes) is shown on Table 11.

Table 11 - Fixed Rate Demand Assumptions

	# Accounts	# Dwelling Units	Flow (ccf)
Single Family	13,001	13,008	1,135,155
Multi Family			
Condo	1,219	1,280	63,309
Duplex	629	1,261	82,625
Triplex	62	186	13,372
Quadplex	88	352	21,804
5+ Units	225	10,741	633,977
Mobile Home Park	5	565	18,556
Total Multi Family	2,228	14,385	833,643
Total Residential	15,229	27,393	2,019,981
Total Commercial	521	562	280,576
Total All Users	15,781	27,955	2,249,374

Fixed Base Rate Calculation

Proposed wastewater base rates were developed according to the customer service revenue requirement shown in Table and the number of billing units as identified in the FY 2020-21 cost of service study. The proposed base rates are calculated on Table 12.

Table 12 - Proposed Base Rate Calculation	FY 2020-21
Base Rate Revenue Requirement	\$746,141
Total Accounts (All Users)	15,781
Monthly Base Rate (\$/account)	\$3.94

Fixed Per Unit Rate Calculation

Fixed Per Dwelling Unit rates were developed based on flow-related costs for each residential housing type. BWA has updated the fixed revenue requirement by customer class according to the latest flow data from these customers and the updated overall rate revenue allocation to flow-related costs. Account-level water consumption was adjusted to reflect overall system flow. Revenue requirements and associated per-dwelling-unit rates are shown on Table 13.

Table 13 - Fixed Per Unit Rates by Customer Class (Current Structure)			
Customer Class	# Dwelling Units	\$ Revenue Req.	\$/Unit
Single Family	1,280	\$2,850,368	\$18.26
Multi Family			
Condo *	186	\$191,438	\$12.46
Duplex	352	\$215,177	\$14.22
Triplex	10,741	\$33,525	\$15.02
Quadplex	565	\$64,712	\$15.32
5+ Units	1,280	\$1,660,090	\$12.88
Mobile Home Park	1,261	\$87,123	\$12.85

BWA recommends that the City make modifications to the current fixed per-dwelling unit rate structure.

BWA Recommendation: Blended Multi Family Fixed Rate

The current schedule of per dwelling unit rates is complicated difficult for customers to understand. While multi-family wastewater flow does not vary greatly with the number of apartments in each complex demand for each class may vary based on the types of housing developments in the City at any given time. BWA recommends that the City consider condensing the current per-dwelling-unit classes to one single family and one multifamily user class. A single rate would apply more broadly and equitably to all multifamily customers.

BWA Recommendation: Dormitory-Style Multi Family Housing Fixed Rate

The City is anticipating several new student housing developments that have as many as 8 beds per dwelling unit. This type of housing generates wastewater flow with high concentrations of wastewater flow per dwelling unit (i.e. more use of the same toilet, showers, and sinks) based on the number of beds in each unit.

BWA recommends that the City charge student housing complexes a fixed rate per bed (rather than per dwelling unit) based on a factor of 1/3 the single-family residential per dwelling unit rate as outlined in Table 14 below.

Table 14 - Dormitory Style Housing Assumptions

Gallons per capita per day, indoor**	57
ccf single family monthly average	7
<u>Gallons per SFR per day</u>	<u>5,236</u>
Assumed number of people (beds) per SFR	3.06
Rounded factor for per-bed fixed charge	1/3
Proposed Dormitory-Style Housing Rate	\$6.08

This recommended charge per bed deviates from the current Per Unit rate category structured on a per-dwelling-unit basis. To avoid confusion, BWA recommends that the City rename this category of charges from “Per unit Charges” to “Residential Fixed Rates” in the future.

Summary of Proposed Residential Fixed Rates

A simplified calculation of the fixed residential rates is shown in Table 15 below, reflecting the sum of multi family dwelling units and total multifamily revenue requirement, and the 1/3 factor for dormitory style housing.

Table 15 - Residential Fixed Rate Summary

Customer Class	# Units	\$ Revenue Req.	\$/Unit
Single Family (\$/unit)	1,280	\$2,850,368	\$18.26
Multi Family (\$/unit)	13,452	\$2,252,065	\$13.05
Dormitory-Style Housing (\$/bed)			\$6.08

Variable Rates

Volumetric Rate Calculation

Volumetric wastewater rates were calculated according to the volumetric rate revenue requirement (40%) and billable units. A summarized calculation of volumetric rates is shown on Table 16.

Customer Class	2020-21		
	Rev	Flow (ccf)	\$/ccf
Residential	\$3,906,301	1,968,798	\$3.13
Commercial			
Low Strength	\$418,825	93,206	\$4.53
Standard Strength	\$449,856	92,903	\$4.69
Medium Strength	\$60,465	12,020	\$4.96
High Strength	\$604,689	75,503	\$8.12

BWA Recommendation: Condense Customer Classes

BWA proposes that the City update the current commercial volumetric customer classes (C-1 to C-7) to a larger listing of commercial customer classes under four strength categories: low, standard, medium, and high strength). Examples of commercial user types in each category are shown in Table 17

Table 17 - Example Customer Classes

Strength Category	Example Customer Classes
Low Strength	Banks & Financial Institutions, Barber Shops, Hair Salons, Dry Cleaners, Laundromats, Offices – Business and Professional, Offices- Medical/Dental (without surgery)
Standard Strength	Residential (All) Auto Dealers, Beauty Shops, Nail Salons, Pet Groomers, Bars & Taverns, Halls & Lodges, Fire Stations, Hospitals, Hotels, Motels, Vacation Rentals
Medium Strength	Restaurants without dishwasher/garbage disposal, Hotels/Motels with a restaurant, carpet cleaners, Funeral Homes, Tasting Rooms
High Strength	Restaurants with a Dishwasher, Bakeries, Butcher Shops, Markets with food service, dairy products, and specialty foods manufacturing

Volumetric Demands

Account level strength factors including BOD and TSS and Ammonia were developed based on Staff input, California State Revenue Guidelines, and BWA expertise. Total flows and strengths were adjusted to reflect the total average annual effluent strength measured at the wastewater plant. A summary of adjusted wastewater demand data by proposed customer class is shown on Table 17.

Table 18 – Volumetric Demands - Proposed Customer Classes

Strength Category	Flow (ccf)	BOD (mg/L) ²	TSS (mg/L) ²	Ammonia mg-N/L	BOD (lbs/Yr)	TSS (lbs/yr)	Ammonia (total N)
Residential	1,968,798	244	264	0.035	3,073,226	3,073,226	3,073,226
Commercial							
Low Strength	93,206	127	84	0.000	75,656	46,557	75,656
Standard Strength	92,903	137	166	0.005	81,510	91,293	81,510
Medium Strength	12,020	244	105	0.005	18,763	7,505	18,763
High Strength	75,503	586	580	0.008	282,858	259,287	282,858
Total	2,242,430				3,532,012	3,477,868	3,532,012
<i>Adjustment Factor</i>					-2.3%	5.4%	0%

Proposed Variable Rate Summary

Volumetric wastewater rates were calculated according to the volumetric rate revenue requirement (40%) and billable units. A summarized calculation of volumetric rates is shown on Table 19.

Table 19 - Proposed Volumetric Rates

Customer Class	2020-21 Rev	Flow (ccf)	Proposed Rate
Residential	\$3,906,301	1,968,798	\$3.13
Commercial			
Low Strength	\$418,825	93,206	\$4.53
Standard Strength	\$449,856	92,903	\$4.69
Medium Strength	\$60,465	12,020	\$4.96
High Strength	\$604,689	75,503	\$8.12

Proposed Rate Summary

The proposed rates were calculated to generate approximately the same rate revenue as the **2020-21 budget** while adjusting the proportional share of rates between customer classes based on the updated cost of service. In order to generate the annual rate revenue requirements, set in the financial plan projection, the wastewater rate revenues will need to be increased 5% per year

Table 20 summarizes the proposed 5-year rate schedule based on the recommended 60% fixed/40% variable rate revenue scenario.

Table 20 - 5-Year Schedule of Proposed Rates

Overall Rate Revenue Increase			5%	5%	5%	5%	5%
Fiscal Year	Current	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Effective Date		Restructure	5/1/2022	5/1/2023	5/1/2024	5/1/2025	5/1/2026
% Fixed Revenue	43%	60%					
Base Rate - Monthly \$/account, all users							
All Users	\$3.94	\$4.05	\$4.25	\$4.47	\$4.69	\$4.93	\$5.17
Monthly Per Unit Rate (\$/dwelling unit)							
Single Family	\$18.26	\$26.46	\$27.78	\$29.17	\$30.63	\$32.16	\$33.77
Multi Family	N/A	\$18.90	\$19.85	\$20.84	\$21.88	\$22.98	\$24.12
Dormitory	\$6.08						
% Vol. Revenue	57%	40%					
Residential	\$3.13	\$1.98	\$2.08	\$2.19	\$2.30	\$2.41	\$2.53
Commercial							
Low Strength	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
Standard Strength	\$4.69	\$4.84	\$5.08	\$5.34	\$5.61	\$5.89	\$6.18
Medium Strength	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
High Strength	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22

(1 ccf = 748 gallons)

*billable use equal to average monthly winter water use (in ccf) from November - February of prior year

Detailed rate calculations are provided in the appendix following this document.

APPENDIX

Wastewater Rate Study
Draft Calculation Tables



City of Davis

Draft Wastewater COS Rate Study 2021

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BARTLE WELLS ASSOCIATES
INDEPENDENT PUBLIC FINANCE ADVISORS

Intro/Financial Plan

Table S1: Current Monthly Wastewater Rates
City of Davis
Draft Wastewater COS Rate Study 2021

Current Monthly Wastewater Rates

Rates Effective	1/1/19
Base Rate - Monthly \$/account, all users	
Base Rate	\$3.94
Monthly Per Unit Rate (\$/dwelling unit, residential only)	
Single Family	\$18.26
Multi Family	
Condominium	\$12.46
Duplex	\$14.22
3 Units	\$15.02
4 Units	\$15.32
5+ Units	\$12.88
Mobile Home	\$12.85
Volumetric Rate (\$/ccf* by customer class)	
Residential	\$3.13
Commercial	
C-1 Office, Retail, Motels	\$4.53
C-2 Laundry, Dry Cleaning	\$4.69
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69
C-4 Convalescent Hospital	\$4.96
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33
C-6 Restaurants / Fast Food	\$8.12
C-7 Industrial	\$6.74
<i>(1 ccf = 748 gallons)</i>	
<i>*billable use equal to average monthly winter water use (in ccf) from November - February of prior year</i>	
Monthly Sewer Cap (maximum monthly ccf billable, by customer class)	
Single Family	24
Multi Family	
Condo	19
Duplex	36
Triplex	56
Quadplex	76
5+ units	19 ccf/unit
Mobile Home Park	19 ccf/unit
Commercial	N/A

Table S2: Current Rate Revenue
 City of Davis
 Draft Wastewater COS Rate Study 2021

Current Rate Revenue

Wastewater Customer Class	Current Demand			Current Rates			Wastewater Rate Revenue			
	#Accounts	# Dwelling Units	Billable Water Use (ccf)*	Fixed Base Rates (\$/acct)	Fixed Unit Rates (\$/dwelling unit)	Volumetric Rates (\$/ccf)	Account Base Charges	Dwelling Unit Charges	Volumetric Revenue	Total
Single Family										
Inside City	13,001	13,008	1,135,155	\$3.94	\$18.26	\$3.13	\$614,699	\$2,850,368	\$3,553,035	\$7,018,102
El Macero	229	338	35,961	\$3.94	\$18.26	\$3.13	\$10,842	\$74,095	\$112,558	\$197,495
North Davis Meadows	97	143	15,222	\$3.94	\$18.26	\$3.13	\$4,589	\$31,365	\$47,646	\$83,600
Subtotal	13,328	13,490	1,186,338				\$630,130	\$2,955,828	\$3,713,239	\$7,299,197
Multi Family										
Condo *	1,219	1,280	63,309	\$3.94	\$12.46	\$3.13	\$57,650	\$191,438	\$198,157	\$447,245
Duplex	629	1,261	82,625	\$3.94	\$14.22	\$3.13	\$29,715	\$215,177	\$258,616	\$503,509
Triplex	62	186	13,372	\$3.94	\$15.02	\$3.13	\$2,931	\$33,525	\$41,854	\$78,310
Quadplex	88	352	21,804	\$3.94	\$15.32	\$3.13	\$4,161	\$64,712	\$68,247	\$137,119
5+ Units	225	10,741	633,977	\$3.94	\$12.88	\$3.13	\$10,650	\$1,660,090	\$1,984,349	\$3,655,089
Mobile Home Park	5	565	18,556	\$3.94	\$12.85	\$3.13	\$236	\$87,123	\$58,080	\$145,440
Subtotal MF	2,228	14,385	833,643				\$105,344	\$2,252,065	\$2,609,303	\$4,966,712
Total Residential	15,556	27,875	2,019,981				\$735,474	\$5,207,893	\$6,322,542	\$12,265,909
Commercial										
Office/Retail	249	249	93,206	\$3.94		\$4.53	\$11,761		\$422,223	\$433,984
Laundry	3	3	4,840	\$3.94		\$4.69	\$142		\$22,700	\$22,841
All Other	159	159	70,459	\$3.94		\$4.69	\$7,529		\$330,453	\$337,982
Conv. Hospital	2	2	12,020	\$3.94		\$4.96	\$95		\$59,619	\$59,714
Auto/Service Station	50	50	17,604	\$3.94		\$5.33	\$2,364		\$93,829	\$96,193
Restaurants	89	89	75,503	\$3.94		\$8.12	\$4,196		\$613,084	\$617,280
Industrial	10	10	6,944	\$3.94		\$6.74	\$473		\$46,803	\$47,275
Subtotal Commercial	562	562	280,576				\$26,560	\$0	\$1,588,711	\$1,615,270
**Inside City Revenue	15,791	27,955	2,249,374				\$746,602	\$5,102,432	\$7,751,049	\$13,600,084
Total Rate Revenue	16,679	28,998	2,581,133				\$762,034	\$5,207,893	\$7,911,253	\$13,881,179
<i>% Total</i>										

*Reflects prior year average winter water use, November 2018 - February 2019. Residential users subject to cap

**Does not include irrigation accounts or city accounts inside the City, El Macero and North Davis Meadows accounts outside city (billed separately)

Table S3: Current Demand
 City of Davis
 Draft Wastewater COS Rate Study 2021

Current Demand

Monthly Sewer Demand by Strength Factor Flow	1/1/19	2/1/19	3/1/19	4/1/19	5/1/19	6/1/19	7/1/19	8/1/19	9/1/19	10/1/19	11/1/19	12/1/19	CY 2019 Total	
2019 Sewer Flow														
Flow (mgd)	4.36	5.45	6.04	6.49	6.30	5.63	4.58	4.56	4.17	4.64	4.87	4.23	5.11	avg mgd
avg daily flow (ccf)	5,822	7,290	8,078	8,671	8,427	7,522	6,118	6,090	5,577	6,202	6,507	5,652	6,829.50	avg ccf/month
Monthly Sewer Flow (ccf)	180,471	204,117	250,421	260,126	261,222	225,665	189,667	188,785	167,304	192,247	195,201	169,552	2,484,777	ccf/yr
Billable Monthly Sewer Flow (ccf, Table S2)	163,373	184,779	226,697	235,482	236,474	204,286	171,698	170,900	151,454	174,034	176,708	153,489	2,249,374	adj. ccf/yr
Adjustment Factor													91%	
2016-2020 Avg Assumed Strength Factors*														
Billable Monthly Sewer Flow (gpd)	334,826	378,698	464,605	482,610	484,644	418,675	351,889	350,252	310,398	356,675	362,156	314,569		adj. gpd
Biochemical Oxygen Demand (BOD, mg/l)	293	267	240	246	226	215	244	243	229	254	243	262		mg/L
Total Suspended Solids (TSS, mg/l)	303	300	242	263	249	241	249	265	243	248	247	254		mg/L
Ammonia (total as N)	44	45	44					45	31			48		mg/L
2019 Calculated WW Flows & Loadings														
Biochemical Oxygen Demand (BOD, total lbs)	298,419	307,923	339,037	361,014	333,975	274,589	260,977	259,245	216,660	275,573	268,108	251,046	3,446,568	total lbs/yr
Total Suspended Solids (TSS, total lbs)	308,848	345,617	342,444	386,341	367,995	306,559	267,085	282,736	230,044	269,487	271,983	243,693	3,622,831	total lbs/yr
Ammonia (mg total N)	44,847	51,876	62,229					47,522	29,291			45,964	281,729	total lbs/yr

Source: City of Davis

*Does not include irrigation accounts or city accounts inside the City, El Macero and North Davis Meadows accounts outside city (billed separately)

Table S4: Customer Growth Projections
City of Davis
Draft Wastewater COS Rate Study 2021

Customer Growth Projections

	Budget	Accounts	Projected				
	2020-21		2020-21	2021-22	2022-23	2023-24	2024-25
Estimated Capacity Fee Increase ¹			3.0%	3.0%	3.0%	3.0%	3.0%
Capacity Fee, \$/EDU²	\$6,150	15,556	\$6,335	\$6,525	\$6,720	\$6,922	\$7,130
Residential							
Single-family	\$6,150						
Single-family condo	\$4,780						
Duplex	\$4,640						
Triplex	\$4,810						
Quadplex	\$4,860						
Multiple-family (five or more units)	\$3,320						
MH mobile homes	\$3,400						
Commercial/Industrial		562					
Flow (hcf/day, Nov-Feb)	\$14,346						
BOD (lbs/day)	\$1,556						
TSS (lbs/day)	\$853						
Estimated Annual Growth		0.5%					
Estimated Growth, EDUs ³		33	157	157	157	157	157
Estimated Revenue	\$200,000		\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262

EDUs estimated using number of accounts, 2020-21 growth estimated using budget divided by fee

1 - Estimated annual increase of Engineering News Record Construction Cost Index (ENR CCI) for San Francisco

Table S5: Wastewater Revenue Projection
 City of Davis
 Draft Wastewater COS Rate Study 2021

Wastewater Revenue Projection

% Escalation by Activity #	
Sales	0.5%
Investments	1.0%
Other Agencies	0.0%
SRF Reimbursements	0.0%

	Budget		Projected								
	2020-21	% Escalation	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
531 - Operations and Maintenance											
Grants / Ofc Emerg Svcs Reimb		0.5%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sewer Service Fee	\$13,600,084	0.5%	\$13,668,085	\$13,736,425	\$13,805,107	\$13,874,133	\$13,943,503	\$14,013,221	\$14,083,287	\$14,153,703	\$14,224,472
Sewer Maintenance/El Macero	197,495	0.5%	\$198,482	\$199,475	\$200,472	\$201,475	\$202,482	\$203,494	\$204,512	\$205,534	\$206,562
Sewer Maint/N Davis Meadows	83,600	0.5%	\$84,018	\$84,438	\$84,860	\$85,285	\$85,711	\$86,140	\$86,570	\$87,003	\$87,438
Sewer Tap/Lateral Install Fee	5,000	0.5%	\$5,025	\$5,050	\$5,075	\$5,101	\$5,126	\$5,152	\$5,178	\$5,204	\$5,230
Interest Earned / From Investments	131,045	2.0%	\$133,666	\$136,339	\$139,066	\$141,847	\$144,684	\$147,578	\$150,530	\$153,540	\$156,611
Tower Leases / Verizon	16,318	0.5%	\$16,400	\$16,482	\$16,564	\$16,647	\$16,730	\$16,814	\$16,898	\$16,982	\$17,067
Land Lease/Open Spc Crops	46,980	0.5%	\$47,215	\$47,451	\$47,688	\$47,927	\$48,166	\$48,407	\$48,649	\$48,892	\$49,137
Pretreatment Fees	285,000	0.5%	\$286,425	\$287,857	\$289,296	\$290,743	\$292,197	\$293,658	\$295,126	\$296,602	\$298,085
Total Fund 531	\$14,365,522		\$14,439,315	\$14,513,517	\$14,588,130	\$14,663,156	\$14,738,600	\$14,814,463	\$14,890,749	\$14,967,461	\$15,044,601
532 - Capital Replacement											
Interest Earned / From Investments	\$324,345	1.00%	\$327,588	\$330,864	\$334,173	\$337,515	\$340,890	\$344,299	\$347,742	\$351,219	\$354,731
Total Fund 532	\$324,345		\$327,588	\$330,864	\$334,173	\$337,515	\$340,890	\$344,299	\$347,742	\$351,219	\$354,731
533 - Capital Expansion											
Interest Earned / From Investments	\$0	0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Wastewater Capacity Fees	200,000	Growth Proj.	992,673	1,022,453	1,053,127	1,084,721	1,117,262	1,150,780	1,185,304	1,220,863	1,257,489
Total Fund 532	\$200,000		\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262	\$1,150,780	\$1,185,304	\$1,220,863	\$1,257,489
Total Revenue	\$14,889,867		\$15,759,577	\$15,866,835	\$15,975,429	\$16,085,392	\$16,196,752	\$16,309,542	\$16,423,794	\$16,539,543	\$16,656,821
Rate Revenue (No Rate Increases)	\$13,881,179	0.5%	\$13,950,585	\$14,020,338	\$14,090,440	\$14,160,892	\$14,231,696	\$14,302,855	\$14,374,369	\$14,446,241	\$14,518,472
All Other Operating Revenue	\$353,298	0.0%	\$355,064	\$356,840	\$358,624	\$360,417	\$362,219	\$364,030	\$365,850	\$367,680	\$369,518
Total Operating Revenue	\$14,234,477		\$14,305,650	\$14,377,178	\$14,449,064	\$14,521,309	\$14,593,916	\$14,666,885	\$14,740,220	\$14,813,921	\$14,887,990
Total Investment Income	\$455,390	1.00%	\$461,254	\$467,204	\$473,239	\$479,362	\$485,574	\$491,877	\$498,271	\$504,759	\$511,342
Capacity Fees	\$200,000	3.00%	\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262	\$1,150,780	\$1,185,304	\$1,220,863	\$1,257,489
All Other Non-Operating Revenue	\$0	0.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Non-Operating Revenue	\$655,390		\$1,453,927	\$1,489,657	\$1,526,366	\$1,564,083	\$1,602,836	\$1,642,657	\$1,683,575	\$1,725,622	\$1,768,831

Table S6: Wastewater O&M Expense Projection
 City of Davis
 Draft Wastewater COS Rate Study 2021

Wastewater O&M Expense Projection

	Budget		Projected									
	2020-21	% Escalation	1 2021-22	2 2022-23	3 2023-24	4 2024-25	5 2025-26	6 2026-27	7 2027-28	8 2028-29	9 2029-30	10 2030-31
Salaries/Wages	\$2,173,451	2.25%	\$2,222,354	\$2,272,357	\$2,323,485	\$2,375,763	\$2,429,218	\$2,483,875	\$2,539,762	\$2,596,907	\$2,655,337	\$2,715,082
Part time Wages/Benefits	\$211,066	3.20%	\$217,820	\$224,790	\$231,984	\$239,407	\$247,068	\$254,974	\$263,134	\$271,554	\$280,244	\$289,211
Overtime/Standby/Callback	\$130,528	2.25%	\$133,465	\$136,468	\$139,538	\$142,678	\$145,888	\$149,171	\$152,527	\$155,959	\$159,468	\$163,056
Retirement	\$890,634	6.97%	\$952,711	\$1,019,115	\$1,090,147	\$1,166,131	\$1,247,410	\$1,334,355	\$1,427,359	\$1,526,846	\$1,633,267	\$1,747,106
Leave	\$25,818	2.25%	\$26,399	\$26,993	\$27,600	\$28,221	\$28,856	\$29,505	\$30,169	\$30,848	\$31,542	\$32,252
Health/Dental/Cafeteria Plan	\$527,033	3.00%	\$542,844	\$559,129	\$575,903	\$593,180	\$610,976	\$629,305	\$648,184	\$667,630	\$687,659	\$708,288
Retiree Medical	\$563,588	2.50%	\$577,678	\$592,120	\$606,923	\$622,096	\$637,648	\$653,589	\$669,929	\$686,677	\$703,844	\$721,440
Add Pays	\$35,568	2.25%	\$36,368	\$37,187	\$38,023	\$38,879	\$39,754	\$40,648	\$41,563	\$42,498	\$43,454	\$44,432
Other Benefits	\$1,397	1.00%	\$1,411	\$1,425	\$1,439	\$1,454	\$1,468	\$1,483	\$1,498	\$1,513	\$1,528	\$1,543
Workers Comp	\$93,786	2.25%	\$95,896	\$98,054	\$100,260	\$102,516	\$104,823	\$107,181	\$109,593	\$112,058	\$114,580	\$117,158
Unemployment Insurance	\$9,856	2.25%	\$10,078	\$10,305	\$10,536	\$10,773	\$11,016	\$11,264	\$11,517	\$11,776	\$12,041	\$12,312
Additional Labor Expenses**	\$150,000	2.74%	\$899,536	\$924,184	\$949,506	\$975,523	\$1,002,252	\$1,029,714	\$1,057,928	\$1,086,915	\$1,116,697	\$1,147,294
Resiliency		TBD										
Other Resources (All Other Expenses)												
45 Professional Services	\$294,951	2.00%	\$300,850	\$306,867	\$313,004	\$319,264	\$325,650	\$332,163	\$338,806	\$345,582	\$352,494	\$359,544
19 Transfers	\$908,165	2.00%	\$926,328	\$944,855	\$963,752	\$983,027	\$1,002,688	\$1,022,741	\$1,043,196	\$1,064,060	\$1,085,341	\$1,107,048
13 Insurance	\$6,189	2.00%	\$6,313	\$6,439	\$6,568	\$6,699	\$6,833	\$6,970	\$7,109	\$7,251	\$7,396	\$7,544
41 Internal Support Services	\$653,215	2.00%	\$666,279	\$679,605	\$693,197	\$707,061	\$721,202	\$735,626	\$750,339	\$765,345	\$780,652	\$796,265
Staff Development/Training	\$156,383	2.00%	\$159,511	\$162,701	\$165,955	\$169,274	\$172,659	\$176,113	\$179,635	\$183,228	\$186,892	\$190,630
10 Leave Time Pay	\$0	2.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 Transfers	\$521,825	2.00%	\$532,262	\$542,907	\$553,765	\$564,840	\$576,137	\$587,660	\$599,413	\$611,401	\$623,629	\$636,102
88 Indirect Cost Recovery	\$624,440	2.00%	\$636,929	\$649,667	\$662,661	\$675,914	\$689,432	\$703,221	\$717,285	\$731,631	\$746,264	\$761,189
49 Rental/Leasing	\$162,527	2.00%	\$165,778	\$169,093	\$172,475	\$175,924	\$179,443	\$183,032	\$186,692	\$190,426	\$194,235	\$198,120
01 Regular Full Time	\$5,211	2.00%	\$5,315	\$5,422	\$5,530	\$5,641	\$5,753	\$5,868	\$5,986	\$6,106	\$6,228	\$6,352
11 Special Duty Pay	\$0	2.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12 Additional Pays	\$3,041	2.00%	\$3,102	\$3,164	\$3,227	\$3,292	\$3,358	\$3,425	\$3,493	\$3,563	\$3,634	\$3,707
23 Materials & Supplies	\$575,660	2.00%	\$587,173	\$598,917	\$610,895	\$623,113	\$635,575	\$648,287	\$661,252	\$674,477	\$687,967	\$701,726
25 Small Tools & Equipment	\$266,350	2.00%	\$271,677	\$277,111	\$282,653	\$288,306	\$294,072	\$299,953	\$305,952	\$312,071	\$318,313	\$324,679
43 Maint & Repair Services	\$270,700	2.00%	\$276,114	\$281,636	\$287,269	\$293,014	\$298,875	\$304,852	\$310,949	\$317,168	\$323,512	\$329,982
46 Technical Services	\$267,000	2.00%	\$272,340	\$277,787	\$283,343	\$289,009	\$294,790	\$300,685	\$306,699	\$312,833	\$319,090	\$325,472
04 Temporary Part Time	\$1,022	2.00%	\$1,042	\$1,063	\$1,085	\$1,106	\$1,128	\$1,151	\$1,174	\$1,197	\$1,221	\$1,246
05 Overtime Pay	\$0	2.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
48 Special/Utility Services	\$757,123	3.00%	\$779,837	\$803,232	\$827,329	\$852,149	\$877,713	\$904,044	\$931,166	\$959,101	\$987,874	\$1,017,510
50 Payment To Other Agencies	\$118,000	2.00%	\$120,360	\$122,767	\$125,223	\$127,727	\$130,282	\$132,887	\$135,545	\$138,256	\$141,021	\$143,841
Total Other Resources	\$5,591,802		\$5,711,209	\$5,833,232	\$5,957,929	\$6,085,361	\$6,215,589	\$6,348,678	\$6,484,692	\$6,623,698	\$6,765,763	\$6,910,957
Total Operations & Maintenance Expenses	\$10,404,527		\$11,427,769	\$11,735,357	\$12,053,274	\$12,381,981	\$12,721,966	\$13,073,742	\$13,437,855	\$13,814,879	\$14,205,423	\$14,610,132
<i>Overall Percent Change</i>				3%	3%	3%	3%	3%	3%	3%	3%	3%

**staff augmentation and additional staff for identified needs

Table S7: Current Debt Service
City of Davis
Draft Wastewater COS Rate Study 2021

Current Debt Service

	Annual Debt Service	2020 Outstanding Principal	Year of Final Payment	Description
SRF Loan - WWTP 8010	\$2,086,828	\$50,116,921	2049	2014 loan for Davis Wastewater Treatment Plant Secondary and Tertiary Improvements project to meet the City's future wastewater treatment needs
Total				

Capital Improvement Plan

	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Sewer Lift Station 4 , 1 , 3										
Phase 1 Recycled Water Facilities										
WWTP Biofilter	\$1,500,000									
WWTP Storage Building						\$1,000,000				
WWTP Access Rd Repair	\$184,000	\$1,640,000								
Sewer Trunk Rehabilitation	\$2,050,000	\$950,000	\$6,280,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
Primary Sedimentation tank 3 (1997)				\$150,000	\$1,000,000		\$100,000	\$100,000	\$100,000	\$100,000
WWTP Levee Improvement										
Grit Basin Rehab/Coating/Equipment (1970)		\$250,000	\$250,000	\$1,000,000						
Sed Tank 1 Rehab Coating/Equipment			\$100,000	\$100,000	\$100,000	\$300,000				
Sed Tank 2 Rehab Coating/Equipment		\$1,150,000						\$100,000	\$100,000	\$100,000
Primary/Scum Equipment Replacement (1997)			\$200,000	\$200,000	\$500,000					
Digester Improvement (Coating, Mixing System)			\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000
Miscellaneous Improvements							\$300,000	\$300,000	\$300,000	\$300,000
Influent Barscreen Structure										
Wastewater Resiliency Projects										
Equipment Replacement Schedule			\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000
Additional Aeration Basin/WWTP Future					\$600,000	\$1,500,000	\$1,500,000	\$1,500,000		
Lift 1 Force main	\$0	\$0	\$0	\$0	\$0					
Total	\$4,834,000	\$3,990,000	\$7,170,000	\$2,040,000	\$2,790,000	\$3,390,000	\$2,490,000	\$2,590,000	\$1,090,000	\$1,090,000
Inflation Adjusted Total (3% per year)*	\$4,979,020	\$4,232,991	\$7,834,853	\$2,296,038	\$3,234,375	\$4,047,837	\$3,062,386	\$3,280,935	\$1,422,203	\$1,464,869

Table S8B: Capital Improvement Plan
 City of Davis
 Draft Wastewater COS Rate Study 2021

2031-2041

Capital Improvement Plan

	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	20 YEAR TOTAL
Sewer Lift Station 4 , 1 , 3											\$9,031,427
Phase 1 Recycled Water Facilities											\$1,453,280
WWTP Biofilter											\$1,500,000
WWTP Storage Building											\$1,000,000
WWTP Access Rd Repair											\$1,922,000
Sewer Trunk Rehabilitation	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$14,280,000
Primary Sedimentation tank 3 (1997)	\$100,000	\$100,000									\$1,750,000
WWTP Levee Improvement											\$0
Grit Basin Rehab/Coating/Equipment (1970)											\$1,500,000
Sed Tank 1 Rehab Coating/Equipment	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000					\$1,200,000
Sed Tank 2 Rehab Coating/Equipment	\$100,000	\$100,000	\$100,000								\$1,750,000
Primary/Scum Equipment Replacement											\$900,000
Digester Improvement (Coating, Mixing System)	\$125,000										\$1,125,000
	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$4,200,000
Influent Barscreen Structure		\$5,000,000									\$5,000,000
Wastewater Resiliency Projects											\$0
Equipment Replacement Schedule	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$215,000	\$3,870,000
Additional Aeration Basin/WWTP Future Lift 1 Force main											\$5,100,000
											\$0
Total	\$1,190,000	\$6,065,000	\$965,000	\$865,000	\$865,000	\$865,000	\$765,000	\$765,000	\$765,000	\$765,000	\$57,131,707
Inflation Adjusted Total (3% per year)*	\$1,647,238	\$8,647,240	\$1,417,135	\$1,308,390	\$1,347,642	\$1,388,071	\$1,264,428	\$1,302,361	\$1,341,432	\$1,381,675	\$68,683,826

Table S9: Fund Balance
 City of Davis
 Draft Wastewater COS Rate Study 2021

Fund Balance

Fund Balance - Working Capital		Actual
Fund	Description	6/30/20
531	Operations	\$3,338,163
532	Capital Replacement	\$20,868,572
533	Capital Expansion	\$1,070,164
Total Fund Balance - Working Capital		\$25,276,899

Minimum Fund Balance Requirements	FY 2020-21	Calculated Projection											
		2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2030-31	2031-32	2032-33	2033-34
1. Fund 531 - Operations	\$2,601,132	\$2,856,942	\$2,933,839	\$3,013,319	\$3,095,495	\$3,180,491	\$3,268,436	\$3,359,464	\$3,453,720	\$3,551,356	\$3,652,533	\$3,757,422	\$3,866,202
The City will maintain a target 3-month operating cost reserve balance													
2. Fund 532 - Capital Replacement	\$5,963,341	\$4,164,800	\$3,876,000	\$3,576,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
Target reserve shall be the average of the planned expenditures in the 5-year CIP <i>recommended: 5-year rolling average CIP, minimum of \$3 million</i>													
3. Rate Stabilization	\$711,724	\$721,966	\$725,676	\$729,406	\$733,158	\$736,930	\$740,723	\$744,537	\$748,373	\$752,230	\$756,109	\$760,009	\$763,931
5% of annual wastewater operating revenue													
4. Debt Funds Held as Required	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
One year of debt service payments													
Total Minimum Fund Balance	\$11,363,025	\$9,830,536	\$9,622,343	\$9,405,553	\$8,915,481	\$9,004,249	\$9,095,987	\$9,190,829	\$9,288,921	\$9,390,414	\$9,495,470	\$9,604,259	\$9,716,962

Table S10A: 5-Year Cash Flow Projection
City of Davis
Draft Wastewater COS Rate Study 2021

5-Year Cash Flow Projection

Projection	Budget	1	2	3	4	5
Fiscal Year	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Effective Date		5/1/22	5/1/23	5/1/24	5/1/25	5/1/26
Months Effective		2	2	2	2	2
Proposed Rate Revenue Increase		5.0%	5.0%	5.0%	5.0%	5.0%
<i>Growth</i>		0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$25,276,899	\$15,892,704	\$13,285,908	\$11,917,192	\$7,409,480	\$8,930,500
REVENUE						
Operating Revenue						
Wastewater Rate Revenue*	\$13,881,179	\$14,077,829	\$14,839,964	\$15,582,253	\$16,361,367	\$17,179,436
All Other Operating Revenue	\$353,298	\$355,064	\$356,840	\$358,624	\$360,417	\$362,219
Total Operating Revenue	\$14,234,477	\$14,432,894	\$15,196,804	\$15,940,877	\$16,721,784	\$17,541,655
Non- Operating Revenue						
Total Investment Income	\$455,390	\$461,254	\$467,204	\$473,239	\$479,362	\$485,574
Capacity Fees	\$200,000	\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262
All Other Non-Operating Revenue	\$0	\$0	\$0	\$0	\$0	\$0
Total Non-Operating Revenue	\$655,390	\$1,453,927	\$1,489,657	\$1,526,366	\$1,564,083	\$1,602,836
TOTAL REVENUE	\$14,889,867	\$15,886,821	\$16,686,460	\$17,467,243	\$18,285,867	\$19,144,491
EXPENDITURES						
Operating Expenses						
Total Salaries and Wages	\$2,173,451	\$2,222,354	\$2,272,357	\$2,323,485	\$2,375,763	\$2,429,218
Total Personnel Costs	\$2,639,274	\$3,494,206	\$3,629,769	\$3,771,861	\$3,920,858	\$4,077,159
Other Resources	\$5,591,802	\$5,711,209	\$5,833,232	\$5,957,929	\$6,085,361	\$6,215,589
Total Operating Expenses	\$10,404,527	\$11,427,769	\$11,735,357	\$12,053,274	\$12,381,981	\$12,721,966
Non-Operating Expenses						
Total CIP	\$11,782,707	\$4,979,020	\$4,232,991	\$7,834,853	\$2,296,038	\$3,234,375
Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$13,869,535	\$7,065,848	\$6,319,819	\$9,921,680	\$4,382,866	\$5,321,203
TOTAL EXPENDITURES	\$24,274,062	\$18,493,617	\$18,055,176	\$21,974,955	\$16,764,847	\$18,043,168
Net Revenue	(\$9,384,195)	(\$2,606,796)	(\$1,368,716)	(\$4,507,712)	\$1,521,020	\$1,101,323
Ending Fund Balance	\$15,892,704	\$13,285,908	\$11,917,192	\$7,409,480	\$8,930,500	\$10,031,823
<i>Fund Balance Target</i>	\$11,363,025	\$9,830,536	\$9,622,343	\$9,405,553	\$8,915,481	\$9,004,249
Debt Service Coverage	1.84	1.44	1.66	1.86	2.08	2.31

*Rate revenue from service charges based on Table S2 calculated revenue

Table S11A: Cash Flow Projection: Years 1-10
City of Davis
Draft Wastewater COS Rate Study 2021

CASH FLOW PROJECTION: YEARS 1-10

Projection Fiscal Year	Budget 2020-21	1 2021-22	2 2022-23	3 2023-24	4 2024-25	5 2025-26	6 2026-27	7 2027-28	8 2028-29	9 2029-30	10 2030-31
Proposed Rate Revenue Increase		5.0%	5.0%	5.0%	5.0%	5.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Growth		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$25,276,899	\$15,892,704	\$13,285,908	\$11,917,192	\$7,409,480	\$8,930,500	\$10,031,823	\$10,809,456	\$10,451,496	\$9,917,642	\$11,279,080
REVENUE											
Rate Revenue	\$13,881,179	\$14,077,829	\$14,839,964	\$15,582,253	\$16,361,367	\$17,179,436	\$17,979,353	\$18,520,156	\$19,075,768	\$19,648,041	\$20,237,482
All Other Operating Rev.	\$353,298	\$355,064	\$356,840	\$358,624	\$360,417	\$362,219	\$364,030	\$365,850	\$367,680	\$369,518	\$371,366
Capacity Fees	\$200,000	\$992,673	\$1,022,453	\$1,053,127	\$1,084,721	\$1,117,262	\$1,150,780	\$1,185,304	\$1,220,863	\$1,257,489	\$1,295,213
All Other Non-Operating Rev.	\$455,390	\$461,254	\$467,204	\$473,239	\$479,362	\$485,574	\$491,877	\$498,271	\$504,759	\$511,342	\$518,022
Total Revenue	\$14,889,867	\$15,886,821	\$16,686,460	\$17,467,243	\$18,285,867	\$19,144,491	\$19,986,040	\$20,569,582	\$21,169,070	\$21,786,390	\$22,422,083
EXPENDITURES											
Operating Expenses											
Total Salaries and Wages	\$2,173,451	\$2,222,354	\$2,272,357	\$2,323,485	\$2,375,763	\$2,429,218	\$2,483,875	\$5,883,717	\$6,092,490	\$6,310,923	\$6,539,569
Other Personnel Costs	\$2,639,274	\$3,494,206	\$3,629,769	\$3,771,861	\$3,920,858	\$4,077,159	\$4,241,189	\$9,355,472	\$3,507,359	\$3,667,626	\$3,836,798
Other Resources	\$5,591,802	\$5,711,209	\$5,833,232	\$5,957,939	\$6,085,361	\$6,215,589	\$6,348,678	\$6,539,139	\$6,735,313	\$6,937,372	\$7,145,493
Total Operating Expenses	\$10,404,527	\$11,427,769	\$11,735,357	\$12,053,274	\$12,381,981	\$12,721,966	\$13,073,742	\$15,778,328	\$16,335,161	\$16,915,921	\$17,521,861
Non-Operating Expenses											
Total CIP	\$11,782,707	\$4,979,020	\$4,232,991	\$7,834,853	\$2,296,038	\$3,234,375	\$4,047,837	\$3,062,386	\$3,280,935	\$1,422,203	\$1,464,869
Total Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$13,869,535	\$7,065,848	\$6,319,819	\$9,921,680	\$4,382,866	\$5,321,203	\$6,134,665	\$5,149,214	\$5,367,762	\$3,509,031	\$3,551,697
Total Expenditures	\$24,274,062	\$18,493,617	\$18,055,176	\$21,974,955	\$16,764,847	\$18,043,168	\$19,208,407	\$20,927,542	\$21,702,924	\$20,424,952	\$21,073,557
Net Revenue	(\$9,384,195)	(\$2,606,796)	(\$1,368,716)	(\$4,507,712)	\$1,521,020	\$1,101,323	\$777,633	(\$357,960)	(\$533,854)	\$1,361,438	\$1,348,526
Ending Fund Balance	\$15,892,704	\$13,285,908	\$11,917,192	\$7,409,480	\$8,930,500	\$10,031,823	\$10,809,456	\$10,451,496	\$9,917,642	\$11,279,080	\$12,627,606
Fund Balance Target	\$11,363,025	\$9,830,536	\$9,622,343	\$9,405,553	\$8,915,481	\$9,004,249	\$9,095,987	\$9,190,829	\$9,288,921	\$9,390,414	\$9,495,470
Debt Service Coverage	1.84	1.44	1.66	1.86	2.08	2.31	2.53	1.49	1.49	1.49	1.48

Table S11B: Cash Flow Projection: Years 11-20

Projection Fiscal Year	11 2031-32	12 2032-33	13 2033-34	14 2034-35	15 2035-36	16 2036-37	17 2037-38	18 2038-39	19 2039-40	20 2040-41
Proposed Rate Revenue Increase	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$12,627,606	\$13,964,069	\$14,506,563	\$7,826,403	\$8,131,549	\$8,277,833	\$8,092,878	\$7,549,437	\$6,783,719	\$5,604,367
REVENUE										
Rate Revenue	\$20,810,377	\$20,810,377	\$21,227,425	\$21,651,978	\$22,085,017	\$22,526,718	\$22,977,252	\$23,436,797	\$23,905,533	\$24,383,644
All Other Operating Rev.	\$373,223	\$375,089	\$376,964	\$378,849	\$380,743	\$382,647	\$384,560	\$386,483	\$388,415	\$390,357
Capacity Fees	\$1,334,070	\$1,374,092	\$1,415,314	\$1,457,774	\$1,501,507	\$1,546,552	\$1,592,949	\$1,640,737	\$1,689,959	\$1,740,658
All Other Non-Operating Rev.	\$524,799	\$531,677	\$538,656	\$545,737	\$552,924	\$560,217	\$567,618	\$575,129	\$582,752	\$590,489
Total Revenue	\$23,042,468	\$23,091,234	\$23,558,359	\$24,034,338	\$24,520,191	\$25,016,134	\$25,522,379	\$26,039,146	\$26,566,660	\$27,105,148
EXPENDITURES										
Operating Expenses										
Total Salaries and Wages	\$6,779,016	\$7,029,892	\$7,292,861	\$7,568,633	\$7,857,965	\$8,161,661	\$8,480,579	\$8,815,632	\$9,167,795	\$9,538,104
Other Personnel Costs	\$4,015,434	\$4,204,128	\$4,403,518	\$4,614,280	\$4,837,139	\$5,072,866	\$5,322,286	\$5,586,278	\$5,865,780	\$6,161,794
All Other Baseline Expenses	\$7,359,858	\$7,580,654	\$7,808,073	\$8,042,316	\$8,283,585	\$8,532,093	\$8,788,055	\$9,051,697	\$9,323,248	\$9,602,945
Total Operating Expenses	\$18,154,308	\$18,814,674	\$19,504,452	\$20,225,229	\$20,978,689	\$21,766,620	\$22,590,921	\$23,453,608	\$24,356,823	\$25,302,844
Non-Operating Expenses										
Total CIP	\$1,464,869	\$1,647,238	\$8,647,240	\$1,417,135	\$1,308,390	\$1,347,642	\$1,388,071	\$1,264,428	\$1,302,361	\$1,341,432
Total Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,827	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$3,551,697	\$3,734,066	\$10,734,068	\$3,503,963	\$3,395,218	\$3,434,469	\$3,474,899	\$3,351,256	\$3,389,189	\$3,428,260
Total Expenditures	\$21,706,005	\$22,548,740	\$30,238,519	\$23,729,192	\$24,373,907	\$25,201,089	\$26,065,820	\$26,804,864	\$27,746,012	\$28,731,104
Net Revenue	\$1,336,463	\$542,494	(\$6,680,160)	\$305,146	\$146,284	(\$184,955)	(\$543,441)	(\$765,718)	(\$1,179,353)	(\$1,625,956)
Ending Fund Balance	\$13,964,069	\$14,506,563	\$7,826,403	\$8,131,549	\$8,277,833	\$8,092,878	\$7,549,437	\$6,783,719	\$5,604,367	\$3,978,410
Fund Balance Target	\$9,604,259	\$9,716,962	\$9,833,770	\$9,954,886	\$10,080,526	\$10,210,915	\$10,346,298	\$10,486,930	\$10,633,082	\$10,785,044
Debt Service Coverage	2.34	2.05	1.94	1.83	1.70	1.56	1.40	1.24	1.06	0.86

Projected Rate Revenue Requirement

		Calculated 2020-21									
<u>Baseline Rate Revenue, Table S2</u>											
Inside City		\$13,600,084									
<u>Outside City (El Macero, North Davis Meadows)</u>		\$281,095									
Total		\$13,881,179									
Projection		1	2	3	4	5	6	7	8	9	10
Fiscal Year		2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Effective Date		5/1/22	5/1/23	5/1/24	5/1/25	5/1/26	5/1/27	5/1/28	5/1/29	5/1/30	5/1/31
Rate Revenue Increase (Table S12)		5.0%	5.0%	5.0%	5.0%	5.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Growth Projection (Table S4)		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
<i>Assumed # Months Growth</i>	12	12	12	12	12	12	12	12	12	12	12
<i># Months without Rate Increase</i>	10	10	10	10	10	10	10	10	10	10	10
<i># Months with Rate Increase</i>	2	2	2	2	2	2	2	2	2	2	2
Full Year of Rate Increases - Inside City	\$13,600,084	\$14,280,088	\$14,994,093	\$15,743,797	\$16,530,987	\$17,357,537	\$17,878,263	\$18,414,611	\$18,967,049	\$19,536,060	\$20,122,142
Full Year of Rate Increases - Outside City	\$281,095	\$295,150	\$309,907	\$325,403	\$341,673	\$358,756	\$369,519	\$380,605	\$392,023	\$403,783	\$415,897
	\$0	\$69,406	\$73,223	\$76,886	\$80,730	\$84,767	\$89,005	\$91,684	\$94,434	\$97,268	\$100,186
Total Rate Revenue (Full Year)	\$13,881,179	\$14,644,644	\$15,377,223	\$16,146,086	\$16,953,390	\$17,801,060	\$18,336,787	\$18,886,899	\$19,453,506	\$20,037,111	\$20,638,225
Months without Rate Increase	\$11,567,649	\$12,203,870	\$12,814,353	\$13,455,072	\$14,127,825	\$14,834,217	\$15,280,656	\$15,739,083	\$16,211,255	\$16,697,593	
Months With Rate Increase	\$2,440,774	\$2,562,871	\$2,691,014	\$2,825,565	\$2,966,843	\$3,056,131	\$3,147,817	\$3,242,251	\$3,339,519	\$3,439,704	
Growth Revenue	\$69,406	\$73,223	\$76,886	\$80,730	\$84,767	\$89,005	\$91,684	\$94,434	\$97,268	\$100,186	
Adjusted Total Rate Revenue Projection	\$13,881,179	\$14,077,829	\$14,839,964	\$15,582,253	\$16,361,367	\$17,179,436	\$17,979,353	\$18,520,156	\$19,075,768	\$19,648,041	\$20,237,482
<i>Inside City Rate Revenue (for COS Analysis)</i>	\$13,600,084	\$13,713,418	\$14,399,089	\$15,119,044	\$15,874,996	\$16,668,745	\$17,444,324	\$17,967,654	\$18,506,684	\$19,061,884	\$19,633,741
<i>Outside City Rate Revenue</i>	\$281,095	\$283,437	\$297,609	\$312,490	\$328,114	\$344,520	\$360,550	\$371,367	\$382,508	\$393,983	\$405,802

Cost of Service Analysis

Wastewater Cost of Service Allocation 50F/50V Split

Expenditure Category	2020-21 Budget	% CS	% Flow	% BOD	% TSS	% Ammonia	Total	% Fixed	% Variable	\$ CS	\$ Flow	\$ BOD	\$ TSS	\$ Ammonia	\$ Total	\$ Fixed	\$ Variable
(From Table 5)																	
Salaries/Wages	\$2,173,451	8%	50%	20%	20%	2%	100%	50%	50%	\$173,876	\$1,086,726	\$434,690	\$434,690	\$43,469	\$2,173,451	\$1,086,726	\$1,086,726
Part time Wages/Benefits	\$211,066	8%	50%	20%	20%	2%	100%	50%	50%	\$16,885	\$105,533	\$42,213	\$42,213	\$4,221	\$211,066	\$105,533	\$105,533
Overtime/Standby/Callback	\$130,528	8%	50%	20%	20%	2%	100%	50%	50%	\$10,442	\$65,264	\$26,106	\$26,106	\$2,611	\$130,528	\$65,264	\$65,264
Retirement	\$890,634	8%	50%	20%	20%	2%	100%	80%	20%	\$71,251	\$445,317	\$178,127	\$178,127	\$17,813	\$890,634	\$712,507	\$178,127
Leave	\$25,818	8%	50%	20%	20%	2%	100%	80%	20%	\$2,065	\$12,909	\$5,164	\$5,164	\$516	\$25,818	\$20,654	\$5,164
Health/Dental/Cafeteria Plan	\$527,033	4%	64%	15%	15%	2%	100%	70%	30%	\$21,081	\$337,301	\$79,055	\$79,055	\$10,541	\$527,033	\$368,923	\$158,110
Retiree Medical	\$563,588	4%	70%	12%	12%	2%	100%	100%	0%	\$22,544	\$394,512	\$67,631	\$67,631	\$11,272	\$563,588	\$563,588	\$0
Add Pays	\$35,568	4%	70%	12%	12%	2%	100%	80%	20%	\$1,423	\$24,898	\$4,268	\$4,268	\$711	\$35,568	\$28,454	\$7,114
Other Benefits	\$1,397	4%	70%	12%	12%	2%	100%	50%	50%	\$56	\$978	\$168	\$168	\$28	\$1,397	\$699	\$699
Workers Comp	\$93,786	4%	70%	12%	12%	2%	100%	70%	30%	\$3,751	\$65,650	\$11,254	\$11,254	\$1,876	\$93,786	\$65,650	\$28,136
Unemployment Insurance	\$9,856	4%	70%	12%	12%	2%	100%	80%	20%	\$394	\$6,899	\$1,183	\$1,183	\$197	\$9,856	\$7,885	\$1,971
Additional Labor Expenses**	\$150,000	4%	70%	12%	12%	2%	100%	50%	50%	\$6,000	\$105,000	\$18,000	\$18,000	\$3,000	\$150,000	\$75,000	\$75,000
Resiliency	\$0	4%	70%	12%	12%	2%	100%	50%	50%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other Resources (All Other Expenses)															\$0	\$0	\$0
45 Professional Services	\$294,951	5%	67%	12%	12%	4%	100%	50%	50%	\$14,748	\$197,617	\$35,394	\$35,394	\$11,798	\$294,951	\$147,476	\$147,476
19 Transfers	\$908,165	5%	67%	12%	12%	4%	100%	50%	50%	\$45,408	\$608,471	\$108,980	\$108,980	\$36,327	\$908,165	\$454,083	\$454,083
13 Insurance	\$6,189	5%	67%	12%	12%	4%	100%	90%	10%	\$309	\$4,147	\$743	\$743	\$248	\$6,189	\$5,570	\$619
41 Internal Support Services	\$653,215	5%	67%	12%	12%	4%	100%	20%	80%	\$32,661	\$437,654	\$78,386	\$78,386	\$26,129	\$653,215	\$130,643	\$522,572
Staff Development/Training	\$156,383	5%	67%	12%	12%	4%	100%	50%	50%	\$7,819	\$104,777	\$18,766	\$18,766	\$6,255	\$156,383	\$78,192	\$78,192
10 Leave Time Pay	\$0	5%	67%	12%	12%	4%	100%	50%	50%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
95 Transfers	\$521,825	5%	67%	12%	12%	4%	100%	40%	60%	\$26,091	\$349,623	\$62,619	\$62,619	\$20,873	\$521,825	\$208,730	\$313,095
88 Indirect Cost Recovery	\$624,440	5%	67%	12%	12%	4%	100%	40%	60%	\$31,222	\$418,375	\$74,933	\$74,933	\$24,978	\$624,440	\$249,776	\$374,664
49 Rental/Leasing	\$162,527	5%	67%	12%	12%	4%	100%	50%	50%	\$8,126	\$108,893	\$19,503	\$19,503	\$6,501	\$162,527	\$81,264	\$81,264
01 Regular Full Time	\$5,211	8%	50%	20%	20%	2%	100%	50%	50%	\$417	\$2,606	\$1,042	\$1,042	\$104	\$5,211	\$2,606	\$2,606
11 Special Duty Pay	\$0	8%	50%	20%	20%	2%	100%	40%	60%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
12 Additional Pays	\$3,041	8%	50%	20%	20%	2%	100%	60%	40%	\$243	\$1,521	\$608	\$608	\$61	\$3,041	\$1,825	\$1,216
23 Materials & Supplies	\$575,660	4%	65%	15%	15%	1%	100%	60%	40%	\$23,026	\$374,179	\$86,349	\$86,349	\$5,757	\$575,660	\$345,396	\$230,264
25 Small Tools & Equipment	\$266,350	4%	65%	15%	15%	1%	100%	50%	50%	\$10,654	\$173,128	\$39,953	\$39,953	\$2,664	\$266,350	\$133,175	\$133,175
43 Maint & Repair Services	\$270,700	4%	65%	15%	15%	1%	100%	50%	50%	\$10,828	\$175,955	\$40,605	\$40,605	\$2,707	\$270,700	\$135,350	\$135,350
46 Technical Services	\$267,000	4%	65%	15%	15%	1%	100%	50%	50%	\$10,680	\$173,550	\$40,050	\$40,050	\$2,670	\$267,000	\$133,500	\$133,500
04 Temporary Part Time	\$1,022	8%	66%	12%	12%	2%	100%	50%	50%	\$82	\$675	\$123	\$123	\$20	\$1,022	\$511	\$511
05 Overtime Pay	\$0	4%	70%	12%	12%	2%	100%	30%	70%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
48 Special/Utility Services	\$757,123	2%	70%	12%	12%	4%	100%	10%	90%	\$15,142	\$529,986	\$90,855	\$90,855	\$30,285	\$757,123	\$75,712	\$681,411
50 Payment To Other Agencies	\$118,000	4%	55%	20%	20%	1%	100%	10%	90%	\$4,720	\$64,900	\$23,600	\$23,600	\$1,180	\$118,000	\$11,800	\$106,200
Total Other Resources	\$5,591,802																
Total Operations & Maintenance	\$10,404,527	5%	61%	15%	15%	3%	100%	51%	49%	\$571,946	\$6,377,040	\$1,590,365	\$1,590,365	\$274,810	\$10,404,527	\$5,296,490	\$5,108,037
Debt Service	\$2,086,828	5%	61%	15%	15%	3%	100%	51%	49%	\$114,715	\$1,279,038	\$318,978	\$318,978	\$55,118	\$2,086,828	\$1,062,313	\$1,024,515
Capital Improvement Plan	\$11,782,707	5%	61%	15%	15%	3%	100%	51%	49%	\$647,706	\$7,221,740	\$1,801,025	\$1,801,025	\$311,211	\$11,782,707	\$5,998,061	\$5,784,646
Total Expenditures	\$24,274,062	5%	61%	15%	15%	3%	100%	50%	50%	\$1,334,367	\$14,877,818	\$3,710,369	\$3,710,369	\$641,139	\$24,274,062	\$12,356,863	\$11,917,199
(Less Other Revenues)	(\$1,008,688)																
(Less Net Revenues)	(\$9,384,195)																
(Less El Macero, NDM Revenues)	(\$281,095)																
Total Revenue Requirement	\$13,600,084									\$747,609	\$8,335,629	\$2,078,817	\$2,078,817	\$359,213	\$13,600,084	\$6,800,042	\$6,800,042
Overall Percent Allocation		5%	61%	15%	15%	3%	100%	50%	50%							50%	50%

Table S13C: Cost Allocation
 City of Davis
 Draft Wastewater COS Rate Study 2021

Rate Revenue Projection - Fixed/Variable Alternatives

	Current COS	Option 1	Option 2	Option 3 - Phased In				
	2021-22	2021-22	2021-22	<u>2021-22</u>	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>	<u>2025-26</u>
Total	100%	100%	100%	100%	100%	100%	100%	100%
% Fixed	43%	60%	50%	46%	50%	53%	57%	60%
% Variable	57%	40%	50%	54%	50%	47%	43%	40%
\$ Total	\$13,600,084	\$13,600,084	\$13,600,084	\$13,600,084	\$13,600,084	\$13,600,084	\$13,600,084	\$13,600,084
\$ Fixed	\$5,849,035	\$8,160,050	\$6,800,042	\$6,311,238	\$6,773,441	\$7,235,644	\$7,697,847	\$8,160,050
\$ Variable	\$7,751,049	\$5,440,034	\$6,800,042	\$7,288,846	\$6,826,643	\$6,364,440	\$5,902,237	\$5,440,034

Table S14: Sewer Flow Estimate Options
 City of Davis
 Draft Wastewater COS Rate Study 2021

Sewer Flow Estimate Options

WATER CONSUMPTION

Water Demand by Customer Class (ccf)*	1/1/19	2/1/19	3/1/19	4/1/19	5/1/19	6/1/19	7/1/19	8/1/19	9/1/19	10/1/19	11/1/19	12/1/19	CY 2019 Total
Single Family Residential	94,913	79,001	85,313	140,508	181,759	237,533	255,227	273,553	231,451	219,918	162,110	92,213	2,053,499
Multi Family Residential	61,594	54,580	57,402	68,215	80,821	76,802	76,538	80,904	74,666	84,234	70,736	49,720	836,212
Commercial	15,471	12,425	14,147	16,405	19,148	21,513	22,441	23,584	21,950	21,044	17,508	12,941	218,577
Total Water Demand	171,978	146,006	156,862	225,128	281,728	335,848	354,206	378,041	328,067	325,196	250,354	154,874	3,108,288
Single Family Residential	3,488	2,903	3,135	5,164	6,680	8,730	9,380	10,054	8,506	8,082	5,958	3,389	75,470
Multi Family Residential	2,264	2,006	2,110	2,507	2,970	2,823	2,813	2,973	2,744	3,096	2,600	1,827	30,732
Commercial	569	457	520	603	704	791	825	867	807	773	643	476	8,033
Total Water Demand	6,320	5,366	5,765	8,274	10,354	12,343	13,018	13,894	12,057	11,952	9,201	5,692	114,235
Billable Water Demand	178,298	151,372	162,627	233,402	292,082	348,191	367,224	391,935	340,124	337,148	259,555	160,566	3,222,523

Billable Water Use Period & Alternatives (ccf)	Prior: Nov 2018 - Feb 2018 (Table S2 - Used in Model)		Current: Nov - Feb 2019 (Billing Alternative - Not Used)		Dec - Feb 2019 (Billing Alternative - Not Used)		Nov - Mar 2019 (Billing Alternative - Not Used)		Dec - Mar 2019 (Billing Alternative - Not Used)	
	Total (ccf)	Adj. Annual (ccf)	Total	Adj. Annual	Monthly Avg	Adj. Annual	Monthly Avg	Adj. Annual	Monthly Avg	Adj. Annual
Residential	656,266	1,968,798	164,067	1,968,798	138,210	1,658,524	167,452	2,009,429	143,684	1,787,576
Commercial	93,525	280,576	23,381	280,576	20,163	241,957	15,031	180,375	171,014	171,014
Total		2,249,374		2,249,374		1,900,482		2,189,804		1,958,590
<i>Compared to Latest (Nov- Feb 2019)</i>				0%		-16%		-3%		-13%

Table S15: Proposed Sewer Use by Customer Class
 City of Davis
 Draft Wastewater COS Rate Study 2021

Proposed Sewer Use by Customer Class

	<u># Accounts</u>	<u># Dwelling Units</u>	<u>Water Use</u> <u>Period</u>	<u>Flow (ccf)</u>	Average (ccf/unit)	<u>Current Cap</u> <u>(ccf</u> <u>maximum)</u>
Single Family	13,001	13,008	Nov - Feb	1,135,155	7	24
Multi Family						
Condo	1,219	1,280	Nov - Feb	63,309	4	19
Duplex	629	1,261	Nov - Feb	82,625	5	36
Triplex	62	186	Nov - Feb	13,372	6	56
Quadplex	88	352	Nov - Feb	21,804	5	76
5+ Units	225	10,741	Nov - Feb	633,977	5	19 ccf/unit
Mobile Home Park	5	565	Nov - Feb	18,556	123	19 ccf/unit
Dormitory-Style Housing (per bed)			Nov - Feb			
Subtotal Multi Family	2,228	14,385		833,643		
Subtotal Residential	15,229			2,019,981		
Commercial						
Office/Retail	249	249	All Use	93,206	31	N/A
Laundry	3	3	All Use	4,840	134	N/A
All Other	159	159	All Use	70,459	37	N/A
Conv. Hospital	2	2	All Use	12,020	501	N/A
Auto/Service Station	50	50	All Use	17,604	29	N/A
Restaurants	89	89	All Use	75,503	71	N/A
Subtotal Commercial	552	552		273,632		
Total	15,781	27,945		2,242,430		

*proposed cap = 2.5 times the average monthly winter water consumption for each customer class, ccf per billing unit

Dormitory Style Multi Family Assumptions	
57	gallons per capita per day, indoor**
7	ccf single family monthly average
5236	gallons per SFR per day
3.06	assumed number of people (beds) per SFR
1/3	Rounded factor for per-bed fixed charge

**gpcd data provided by City Staff

Rate Design

Table S16: Flows & Loadings
 City of Davis
 Draft Wastewater COS Rate Study 2021

Flows and Loadings by Customer Class

Strength Category	Strength Category	Strength Factor Assumptions			2021 Sewer Use by Customer Class			2021 Calculated Sewer Flows & Loadings					Adjusted Strength Factors			% total demand				
		BOD (mg/L) ²	TSS (mg/L) ²	Ammonia mg-N/L	# Accounts	# Dwelling Units	Flow (ccf)	Flow (mg)	Flow (gpd)	BOD (lbs/Yr)	TSS (lbs/yr)	Ammonia (total N)	BOD (mg/L) ²	TSS (mg/L) ²	Ammonia mg-N/L	% CS	% Flow	% BOD	% TSS	% N
Single Family	Single Family	250	250	0.035	13,001	13,008	1,135,155	849	2,326,452	1,729,072	1,866,175	155	244	264	0.035	82.4%	51%	50%	51%	62%
Multi Family																				
Condo	Multi Family	250	250	0.035	1,219	1,280	63,309	47	129,749	96,432	104,079	7	244	264	0.035	8%	3%	3%	3%	3%
Duplex	Multi Family	250	250	0.035	629	1,261	82,625	62	169,336	125,855	135,834	9	244	264	0.035	4%	4%	4%	4%	4%
Triplex	Multi Family	250	250	0.035	62	186	13,372	10	27,405	20,368	21,983	1	244	264	0.035	0%	1%	1%	1%	1%
Quadplex	Multi Family	250	250	0.035	88	352	21,804	16	44,686	33,212	35,845	2	244	264	0.035	1%	1%	1%	1%	1%
5+ Units	Multi Family	250	250	0.035	225	10,741	633,977	474	1,299,309	965,676	1,042,247	69	244	264	0.035	1%	28%	28%	28%	28%
Mobile Home Park	Multi Family	250	250	0.035	5	565	18,556	14	38,030	28,265	30,506	2	244	264	0.035	0%	1%	1%	1%	1%
Subtotal Multi Family					2,228	14,385	833,643	624	1,708,516	1,269,808	1,370,495	91				14%	37%	37%	37%	36%
Total Residential					15,229	27,393	2,019,981	1,473	4,034,968	2,998,880	3,236,670	246				97%	88%	87%	88%	99%
Commercial																				
Office/Retail	Low Strength	130	80	0.000	249	249	93,206	70	191,022	73,825	49,033	0	127	84	0.000	2%	4%	2%	1%	0%
Laundry	Standard Strengt	150	110	0.000	3	3	4,840	4	9,919	4,423	3,501	0	146	116	0.000	0%	0%	0%	0%	0%
All Other	Standard Strengt	130	130	0.005	159	159	70,459	53	144,403	55,808	60,233	1	127	137	0.005	1%	3%	2%	2%	0%
Conv. Hospital	Medium Strengt	250	100	0.005	2	2	12,020	9	24,634	18,309	7,904	0	244	105	0.005	0%	1%	1%	0%	0%
Auto/Service Station	Standard Strengt	180	280	0.005	50	50	17,604	13	36,079	19,306	32,414	0	176	295	0.005	0%	1%	1%	1%	0%
Restaurants	High Strength	600	550	0.008	89	89	75,503	56	154,740	276,015	273,076	2	586	580	0.008	1%	3%	8%	7%	1%
Subtotal Commercial					552	552	273,632	205	560,797	447,688	426,162	3				3%	12%	13%	12%	1%
Total					15,781	27,945	2,242,430	1,677	4,595,765	3,446,568	3,662,831	250				100%	100%	100%	100%	100%
Compare to Total from WWTP, Table S3										3,446,568	3,622,831	250								
Adjustment Factor										0.9766	1.0540									
Customer Class - Alternative Option (4 strength categories)																				
Residential		244	264	0.035	15,229	27,393	1,968,798	1,473	4,034,968	2,998,880	3,236,670	246	244	264	0.035	97%	88%	87%	88%	99%
Low Strength		127	84	0.000	249	249	93,206	70	191,022	73,825	49,033	0	127	84	0.000	2%	4%	2%	1%	0%
Standard Strength		137	166	0.005	212	212	92,903	69	190,401	79,538	96,148	1	137	166	0.005	1%	4%	2%	3%	1%
Medium Strength		244	105	0.005	2	2	12,020	9	24,634	18,309	7,904	0	244	105	0.005	0%	1%	1%	0%	0%
High Strength		586	580	0.008	89	89	75,503	56	154,740	276,015	273,076	2	586	580	0.008	1%	3%	8%	7%	1%
Subtotal Commercial					15,781	27,945	2,242,430	1,677	4,595,765	3,446,568	3,662,831	250				100%	100%	100%	100%	100%

Table S16: Revenue Requirement Allocation
 City of Davis
 Draft Wastewater COS Rate Study 2021

Revenue Requirement Allocation

	% Demand					% Fixed % Variable		\$ Revenue Requirement							
	% CS	% Flow	% BOD	% TSS	% N	% Fixed	% Variable	CS	Flow	BOD	TSS	Ammonia	Total	Fixed	Variable
Total Revenue Requirement	6%	61%	15%	15%	2%	60%	40%	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,419	\$13,600,084	\$8,160,050	\$5,440,034
Single Family	82%	51%	50%	51%	62%	60%	42%	\$632,225	\$4,219,632	\$1,042,899	\$1,059,136	\$210,852	\$7,164,745	\$4,896,511	\$2,268,233
Multi Family															
Condo *	8%	3%	3%	3%	3%	4%	2%	\$59,294	\$235,334	\$58,164	\$59,069	\$9,408	\$421,269	\$297,339	\$123,929
Duplex	4%	4%	4%	4%	4%	4%	3%	\$30,563	\$307,136	\$75,910	\$77,092	\$12,278	\$502,978	\$340,807	\$162,172
Triplex	0%	1%	1%	1%	1%	1%	0%	\$3,015	\$49,707	\$12,285	\$12,477	\$1,987	\$79,471	\$53,207	\$26,264
Quadplex	1%	1%	1%	1%	1%	1%	1%	\$4,279	\$81,050	\$20,032	\$20,344	\$3,240	\$128,946	\$86,115	\$42,830
5+ Units	1%	28%	28%	28%	28%	29%	23%	\$10,953	\$2,356,639	\$582,453	\$591,521	\$94,208	\$3,635,774	\$2,389,383	\$1,246,391
Mobile Home Park	0%	1%	1%	1%	1%	1%	1%	\$243	\$68,977	\$17,048	\$17,313	\$2,757	\$106,339	\$69,857	\$36,482
Subtotal Multi Family	14%	37%	37%	37%	36%	39%	31%	\$108,347	\$3,098,844	\$765,892	\$777,816	\$123,878	\$4,874,776	\$3,207,191	\$1,667,585
Subtotal Residential	97%	88%	87%	88%	99%	99.7%	72%	\$740,572	\$7,318,476	\$1,808,791	\$1,836,951	\$334,730	\$12,039,521	\$8,133,220	\$3,906,301
Commercial						(CS Only)								(CS Only)	(All Other)
Office/Retail	2%	4%	2%	1%	0%	0.1%	8%	\$12,096	\$346,468	\$44,528	\$27,829	\$0	\$430,921	\$12,096	\$418,825
Laundry	0%	0%	0%	0%	0%	0.0%	0%	\$146	\$17,991	\$2,668	\$1,987	\$0	\$22,792	\$146	\$22,646
All Other	1%	3%	2%	2%	0%	0.1%	6%	\$7,744	\$261,912	\$33,661	\$34,185	\$1,496	\$338,998	\$7,744	\$331,254
Conv. Hospital	0%	1%	1%	0%	0%	0.0%	1%	\$97	\$44,681	\$11,043	\$4,486	\$255	\$60,563	\$97	\$60,465
Auto/Service Station	0%	1%	1%	1%	0%	0.0%	2%	\$2,431	\$65,438	\$11,645	\$18,396	\$374	\$98,284	\$2,431	\$95,853
Restaurants	1%	3%	8%	7%	1%	0.1%	11%	\$4,316	\$280,662	\$166,480	\$154,983	\$2,564	\$609,005	\$4,316	\$604,689
Subtotal Commercial	3%	12%	13%	12%	1%	0.3%	28%	\$26,830	\$1,017,153	\$270,025	\$241,865	\$4,689	\$1,560,563	\$26,830	\$1,533,733
Total	100%	100%	100%	100%	100%	100%	100%	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,419	\$13,600,084	\$8,160,050	\$5,440,034
Demand by Customer Class - Alternative Option (4 strength categories)															
Residential	97%	88%	87%	88%	99%	99.7%	72%	\$740,572	\$7,318,476	\$1,808,791	\$1,836,951	\$334,730	\$12,039,521	\$8,133,220	\$3,906,301
Low Strength	2%	4%	2%	1%	0%	0%	8%	\$12,096	\$346,468	\$44,528	\$27,829	\$0	\$430,921	\$12,096	\$418,825
Standard Strength	1%	4%	2%	3%	1%	0%	8%	\$10,321	\$345,342	\$47,974	\$54,568	\$1,972	\$460,177	\$10,321	\$449,856
Medium Strength	0%	1%	1%	0%	0%	0%	1%	\$97	\$44,681	\$11,043	\$4,486	\$255	\$60,563	\$97	\$60,465
High Strength	1%	3%	8%	7%	1%	0%	11%	\$4,316	\$280,662	\$166,480	\$154,983	\$2,564	\$609,005	\$4,316	\$604,689
Subtotal Commercial	3%	12%	13%	12%	1%	0.3%	28%	\$26,830	\$1,017,153	\$270,025	\$241,865	\$4,792	\$1,560,666	\$26,830	\$1,533,836
Total	100%	100%	100%	100%	100%	100%	100%	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,522	\$13,600,187	\$8,160,050	\$5,440,034

Unit Rate Calculation (Total costs/Total billable Units)

	CS	Flow	BOD	TSS	Ammonia
Total Cost Allocation	\$767,402	\$8,335,629	\$2,078,817	\$2,078,817	\$339,419
Billable Units	15,781	2,242,430	3,446,568	3,662,831	250
Unit Rates	\$4.05	\$3.72	\$0.60	\$0.57	\$1.36
	\$/acct	\$/hcf	\$/lb	\$/lb	\$/mg total N

Compare to City of Davis 2017 Water Cost of Service Study

	CS	Flow	BOD	TSS	Ammonia
Total Cost Allocation	\$723,175	\$9,401,276	\$2,169,525	\$2,169,525	N/A
Billable Units	15,231	2,177,498	3,029,500	4,197,500	N/A
Unit Rates	\$3.96	\$4.32	\$0.72	\$0.52	N/A
	\$/acct	\$/hcf	\$/lb	\$/lb	\$/mg total N

Table S18: Fixed Rate Calculation
 City of Davis
 Draft Wastewater COS Rate Study 2021

Fixed Rate Calculation

	2020-21 Current	2020-21 Current	2020-21 Restructure 1	2020-21 Restructure 2	2020-21 Restructure 3
Total Fixed Rate Revenue Requirement		\$5,849,035	\$8,160,050	\$6,800,042	\$6,256,039
% Total collected from Fixed Rates		43%	60%	50%	46%
Base Rate - Monthly \$/account, all users					
Base Rate Revenue Requirement		\$746,141	\$767,402	\$767,402	\$767,402
Total Accounts (All Users)		15,781	15,781	15,781	15,781
Monthly Base Rate (\$/account)		\$3.94	\$4.05	\$4.05	\$4.05

Monthly Per Dwelling Unit Rate (\$/unit, residential only)

Dwelling Unit Rate Revenue Requirement		\$5,102,432	\$7,392,648	\$6,032,640	\$5,488,636
Total Residential Dwelling Units		27,393	27,393	27,393	27,393

<u>Customer Class</u>	<u># Accounts</u>	<u># Units</u>	<u>\$ Rev Req.</u>	<u>\$/Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>
Single Family \$/Unit	13,001	13,008	\$2,850,368	\$18.26	\$26.46	\$21.59	\$19.64
Multi Family \$/Unit (Blended Rate)		14,385	\$2,252,065	\$13.05	\$18.90	\$15.42	\$14.03
Condo *	1,219	1,280	\$191,438	\$12.46	\$18.05	\$14.73	\$13.40
Duplex	629	1,261	\$215,177	\$14.22	\$20.60	\$16.81	\$15.30
Triplex	62	186	\$33,525	\$15.02	\$21.76	\$17.76	\$16.16
Quadplex	88	352	\$64,712	\$15.32	\$22.20	\$18.11	\$16.48
5+ Units	225	10,741	\$1,660,090	\$12.88	\$18.66	\$15.23	\$13.85
Mobile Home Park	5	565	\$87,123	\$12.85	\$18.62	\$15.19	\$13.82
Dormitory-Style Housing (per bed)				N/A	\$8.82	\$7.20	\$6.55
Total	15,781	27,393	\$5,102,432				

Dormitory Style Housing Bill Impacts - Fixed Rates, \$/Unit vs \$/Bed

Proposed Multi Family Housing Developments		# Units	# Beds	Current Rates \$/Unit (5+ Units)	Restructure 1 \$/Bed Charge	Restructure 2 \$/Bed Charge	Restructure 3 \$/Bed Charge
#1	Chiles Rd	57	549	\$734	\$4,841	\$3,951	\$3,595
#2	Lincoln 40	79	708	\$1,018	\$6,244	\$5,095	\$4,636
#3	Nishi Student Housing	700	2,200	\$9,016	\$19,401	\$15,832	\$14,404
#4	1037 Olive Drive	47	61	\$605	\$538	\$439	\$399
Total Dormitory Rate Revenue Projection (TBD)				\$11,373	\$31,024	\$25,317	\$23,034

Table S19: Variable Rate Calculation
City of Davis
Draft Wastewater COS Rate Study 2021

Variable Rate Calculation

		2020-21 Current						2020-21 Restructure 1	2020-21 Restructure 2	2020-21 Restructure 3	
Total Variable Rate Revenue Requirement		\$7,751,049						\$5,440,034	\$6,800,042	\$7,344,045	
% Total collected from variable rate		56%						40%	50%	54%	
		\$ Revenue Requirement						Billable Units			
		\$/ccf	\$ Flow (Net)	BOD	TSS	Ammonia	Total	Flow (ccf)	\$/ccf	\$/ccf	\$/ccf
Single Family	Single Family	\$3.13	\$89,883	\$1,042,899	\$1,059,136	\$210,852	\$2,402,771	1,135,155	\$1.98	\$2.67	\$2.95
Multi Family											
Condo *	Multi Family	\$3.13	-\$42,030	\$58,164	\$59,069	\$9,408	\$84,610	63,309	\$1.98	\$2.67	\$2.95
Duplex	Multi Family	\$3.13	-\$4,623	\$75,910	\$77,092	\$12,278	\$160,657	82,625	\$1.98	\$2.67	\$2.95
Triplex	Multi Family	\$3.13	\$1,135	\$12,285	\$12,477	\$1,987	\$27,883	13,372	\$1.98	\$2.67	\$2.95
Quadplex	Multi Family	\$3.13	-\$12,707	\$20,032	\$20,344	\$3,240	\$30,909	21,804	\$1.98	\$2.67	\$2.95
5+ Units	Multi Family	\$3.13	-\$48,579	\$582,453	\$591,521	\$94,208	\$1,219,603	633,977	\$1.98	\$2.67	\$2.95
Mobile Home Park Dormitory-Style	Multi Family	\$3.13	-\$57,251	\$17,048	\$17,313	\$2,757	-\$20,132	18,556	\$1.98	\$2.67	\$2.95
		N/A									
Subtotal Multi Family			-\$164,055	\$765,892	\$777,816	\$123,878	\$1,503,530	833,643			
Total Residential			-\$74,172	\$1,808,791	\$1,836,951	\$334,730	\$3,906,301	1,968,798			
Commercial											
Office/Retail	Low Strength	\$4.53	\$346,468	\$44,528	\$27,829	\$0	\$418,825	93,206	\$4.49	\$4.49	\$4.49
Laundry	Standard Strength	\$4.69	\$17,991	\$2,668	\$1,987	\$0	\$22,646	4,840	\$4.68	\$4.68	\$4.68
All Other	Standard Strength	\$4.69	\$261,912	\$33,661	\$34,185	\$1,496	\$331,254	70,459	\$4.70	\$4.70	\$4.70
Conv. Hospital	Medium Strength	\$4.96	\$44,681	\$11,043	\$4,486	\$255	\$60,465	12,020	\$5.03	\$5.03	\$5.03
Auto/Service Station	Standard Strength	\$5.33	\$65,438	\$11,645	\$18,396	\$374	\$95,853	17,604	\$5.44	\$5.44	\$5.44
Restaurants	High Strength	\$8.12	\$280,662	\$166,480	\$154,983	\$2,564	\$604,689	75,503	\$8.01	\$8.01	\$8.01
Subtotal Commercial			\$1,017,153	\$270,025	\$241,865	\$4,689	\$1,533,733	273,632			
Total			\$942,981	\$2,078,817	\$2,078,817	\$339,419	\$5,440,034	2,242,430			
Commercial Demand by Customer Class - Alternative Option (4 strength categories)											
Low Strength		\$4.53	\$346,468	\$44,528	\$27,829	\$0	\$418,825	93,206	\$4.49	\$4.49	\$4.49
Standard Strength		\$4.69	\$345,342	\$47,974	\$54,568	\$1,972	\$449,856	92,903	\$4.84	\$4.84	\$4.84
Medium Strength		\$4.96	\$44,681	\$11,043	\$4,486	\$255	\$60,465	12,020	\$5.03	\$5.03	\$5.03
High Strength		\$8.12	\$280,662	\$166,480	\$154,983	\$2,564	\$604,689	75,503	\$8.01	\$8.01	\$8.01
Total			\$1,017,153	\$270,025	\$241,865	\$4,792	\$1,533,836	273,632			

Table S20A: Proposed Rate Summary
City of Davis
Draft Wastewater COS Rate Study 2021

Wastewater Rate Projection (60/40)

Year	Current	<i>Restructure</i>					
Fiscal Year	2020-21	1	1	2	3	4	5
Effective Date		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Overall Rate Revenue Increase			5%	5%	5%	5%	5%
% Fixed Rate Revenue	43%	60%					
Base Rate - Monthly \$/account, all users							
Base Rate	\$3.94	\$4.05	\$4.25	\$4.47	\$4.69	\$4.93	\$5.17
Monthly Per Unit Rate (\$/dwelling unit, residential only)							
Single Family	\$18.26	\$26.46	\$27.78	\$29.17	\$30.63	\$32.16	\$33.77
Multi Family	N/A	\$18.90	\$19.85	\$20.84	\$21.88	\$22.98	\$24.12
Condominium	\$12.46	\$18.05	\$18.96	\$19.90	\$20.90	\$21.94	\$23.04
Duplex	\$14.22	\$20.60	\$21.63	\$22.71	\$23.85	\$25.04	\$26.29
3 Units	\$15.02	\$21.76	\$22.85	\$23.99	\$25.19	\$26.45	\$27.77
4 Units	\$15.32	\$22.20	\$23.31	\$24.47	\$25.70	\$26.98	\$28.33
5+ Units	\$12.88	\$18.66	\$19.59	\$20.57	\$21.60	\$22.68	\$23.82
Dormitory-Style Housing (per bed)	N/A	\$8.82	\$9.26	\$9.72	\$10.21	\$10.72	\$11.26
Mobile Home	\$12.85	\$18.62	\$19.55	\$20.53	\$21.55	\$22.63	\$23.76
% Volumetric Rate Revenue	57%	40%					
Volumetric Rate (\$/ccf* by customer class) - No Structure Change							
Residential	\$3.13	\$1.98	\$2.08	\$2.19	\$2.30	\$2.41	\$2.53
Commercial							
C-1 Office, Retail, Motels	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
C-2 Laundry, Dry Cleaning	\$4.69	\$4.68	\$4.91	\$5.16	\$5.42	\$5.69	\$5.97
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69	\$4.70	\$4.94	\$5.18	\$5.44	\$5.71	\$6.00
C-4 Convalescent Hospital	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33	\$5.44	\$5.72	\$6.00	\$6.30	\$6.62	\$6.95
C-6 Restaurants / Fast Food	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22
Commercial - Alternative Option (4 strength categories)							

Low Strength	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
Standard Strength	\$4.69	\$4.84	\$5.08	\$5.34	\$5.61	\$5.89	\$6.18
Medium Strength	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
High Strength	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22

(1 ccf = 748 gallons)

**billable use equal to average monthly winter water use (in ccf) from November - February of prior year*

Monthly Sewer Cap	Current
Single Family	24
Multi Family	
Condo	19
Duplex	36
Triplex	56
Quadplex	76
5+ units	19 ccf/unit
Mobile Home Park	19 ccf/unit
Dormitory-Style Housing (per bed)	N/A
Commercial	N/A

Table S19B: Proposed Rate Summary
 City of Davis
 Draft Wastewater COS Rate Study 2021

Wastewater Rate Projection (50/50)

Year Fiscal Year Effective Date	Restructure		1 2021-22	2 2022-23	3 2023-24	4 2024-25	5 2025-26
	Current 2020-21	2 2020-21					
Overall Rate Revenue Increase			5%	5%	5%	5%	5%
% Fixed Rate Revenue	43%	50%					
Base Rate - Monthly \$/account, all users							
Base Rate	\$3.94	\$4.05	\$4.25	\$4.47	\$4.69	\$4.93	\$5.17
Monthly Per Unit Rate (\$/dwelling unit, residential only)							
Single Family	\$18.26	\$21.59	\$22.67	\$23.80	\$24.99	\$26.24	\$27.55
Multi Family (Blended Rate)	N/A	\$15.42	\$16.20	\$17.01	\$17.86	\$18.75	\$19.69
Condominium	\$12.46	\$14.73	\$15.47	\$16.24	\$17.05	\$17.91	\$18.80
Duplex	\$14.22	\$16.81	\$17.65	\$18.54	\$19.46	\$20.44	\$21.46
3 Units	\$15.02	\$17.76	\$18.65	\$19.58	\$20.56	\$21.59	\$22.66
4 Units	\$15.32	\$18.11	\$19.02	\$19.97	\$20.97	\$22.02	\$23.12
5+ Units	\$12.88	\$15.23	\$15.99	\$16.79	\$17.63	\$18.51	\$19.44
Mobile Home	\$12.85	\$15.19	\$15.95	\$16.75	\$17.59	\$18.47	\$19.39
Dormitory-Style Housing (per bed)	N/A	\$7.20	\$7.56	\$7.93	\$8.33	\$8.75	\$9.18
% Volumetric Rate Revenue	57%	50%					
Volumetric Rate (\$/ccf* by customer class) - No Structure Change							
Residential	\$3.13	\$2.67	\$2.81	\$2.95	\$3.10	\$3.25	\$3.41
Commercial							
C-1 Office, Retail, Motels	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
C-2 Laundry, Dry Cleaning	\$4.69	\$4.68	\$4.91	\$5.16	\$5.42	\$5.69	\$5.97
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69	\$4.70	\$4.94	\$5.18	\$5.44	\$5.71	\$6.00
C-4 Convalescent Hospital	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33	\$5.44	\$5.72	\$6.00	\$6.30	\$6.62	\$6.95
C-6 Restaurants / Fast Food	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22
Commercial - Alternative Option (4 strength categories)							
Low Strength	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
Standard Strength	Varies	\$4.84	\$5.08	\$5.34	\$5.60	\$5.88	\$6.18
Medium Strength	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
High Strength	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22
(1 ccf = 748 gallons)							
*billable use equal to average monthly winter water use (in ccf) from November - February of prior year							
Monthly Sewer Cap							
Single Family	24						
Multi Family							
Condo	19						
Duplex	36						
Triplex	56						
Quadplex	76						
5+ units	19 ccf/unit						
Mobile Home Park	19 ccf/unit						
Dormitory-Style Housing (per bed)	6 ccf/bed						
Commercial	N/A						

Table S19C: Proposed Rate Summary
 City of Davis
 Draft Wastewater COS Rate Study 2021

Wastewater Rate Projection (Phase-In)

Year Fiscal Year Effective Date	Restructure		1 2021-22	2 2022-23	3 2023-24	4 2024-25	5 2025-26
	Current 2020-21	3 2020-21					
Overall Rate Revenue Increase			5%	5%	5%	5%	5%
% Fixed Rate Revenue	43%	46%	46%	50%	53%	57%	60%
Base Rate - Monthly \$/account, all users							
Base Rate	\$3.94	\$4.05	\$4.25	\$4.47	\$4.69	\$4.93	\$5.17
Monthly Per Unit Rate (\$/dwelling unit, residential only)							
Single Family	\$18.26	\$19.64	\$22.47	\$25.29	\$28.12	\$30.94	\$33.77
Multi Family (Blended Rate)	N/A	\$14.03	\$16.05	\$18.07	\$20.09	\$22.11	\$24.12
Condominium	\$12.46	\$13.40	\$15.33	\$17.26	\$19.19	\$21.11	\$23.04
Duplex	\$14.22	\$15.30	\$17.50	\$19.70	\$21.90	\$24.10	\$26.29
3 Units	\$15.02	\$16.16	\$18.48	\$20.80	\$23.13	\$25.45	\$27.77
4 Units	\$15.32	\$16.48	\$18.85	\$21.22	\$23.59	\$25.96	\$28.33
5+ Units	\$12.88	\$13.85	\$15.85	\$17.84	\$19.83	\$21.82	\$23.82
Mobile Home	\$12.85	\$13.82	\$13.31	\$12.80	\$12.28	\$11.77	\$11.26
Dormitory-Style Housing (per bed)	N/A	\$6.55	\$9.99	\$13.43	\$16.88	\$20.32	\$23.76
% Volumetric Rate Revenue	57%	54%	54%	51%	47%	44%	40%
Volumetric Rate (\$/ccf* by customer class) - No Structure Change							
Residential	\$3.13	\$2.67	\$2.65	\$2.62	\$2.59	\$2.56	\$2.53
Commercial							
C-1 Office, Retail, Motels	\$4.53	\$4.49	\$4.74	\$4.99	\$5.24	\$5.49	\$5.74
C-2 Laundry, Dry Cleaning	\$4.69	\$4.68	\$4.94	\$5.20	\$5.45	\$5.71	\$5.97
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69	\$4.70	\$4.96	\$5.22	\$5.48	\$5.74	\$6.00
C-4 Convalescent Hospital	\$4.96	\$5.03	\$5.31	\$5.59	\$5.86	\$6.14	\$6.42
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33	\$5.44	\$5.75	\$6.05	\$6.35	\$6.65	\$6.95
C-6 Restaurants / Fast Food	\$8.12	\$8.01	\$8.45	\$8.89	\$9.34	\$9.78	\$10.22
Commercial - Alternative Option (4 strength categories)							
Low Strength	\$4.53	\$4.49	\$4.72	\$4.95	\$5.20	\$5.46	\$5.74
Standard Strength	\$4.69 - \$5.33	\$4.84	\$5.08	\$5.34	\$5.60	\$5.88	\$6.18
Medium Strength	\$4.96	\$5.03	\$5.28	\$5.55	\$5.82	\$6.11	\$6.42
High Strength	\$8.12	\$8.01	\$8.41	\$8.83	\$9.27	\$9.73	\$10.22
(1 ccf = 748 gallons)							
*billable use equal to average monthly winter water use (in ccf) from November - February of prior year							
Monthly Sewer Cap	Current						
Single Family	24						
Multi Family							
Condo	19						
Duplex	36						
Triplex	56						
Quadplex	76						
5+ units	19 ccf/unit						
Mobile Home Park	19 ccf/unit						
Dormitory-Style Housing (per bed)	N/A						
Commercial	N/A						

Table S20: Current Rate Revenue
 City of Davis
 Draft Wastewater COS Rate Study 2021

Proposed Rate Revenue Check

Wastewater Customer Class	Current Demand			Rate Restructure 1 (60/40)			Wastewater Rate Revenue			
	# Accounts	# Dwelling Units	Billable Water Use (ccf)*	Fixed Base Rates (\$/acct)	Fixed Unit Rates (\$/dwelling unit)	Volumetric Rates (\$/ccf)	Account Base Charges	Dwelling Unit Charges	Volumetric Revenue	Total
Single Family										
Inside City	13,001	13,008	1,135,155	\$4.05	\$26.46	\$1.98	\$632,215	\$4,129,749	\$2,252,266	\$7,014,230
El Macero	223	233	56,730	\$4.05	\$26.46	\$1.98	\$10,842	\$74,095	\$112,558	\$197,495
North Davis Meadows	94	99	24,014	\$4.05	\$26.46	\$1.98	\$4,589	\$31,365	\$47,646	\$83,600
Subtotal	13,319	13,340	1,215,898				\$647,646	\$4,235,209	\$2,412,469	\$7,295,324
Multi Family										
Condo	1,219	1,280	63,309	\$4.05	\$18.05	\$1.98	\$59,293	\$277,365	\$125,612	\$462,269
Duplex	629	1,261	82,625	\$4.05	\$20.60	\$1.98	\$30,562	\$311,759	\$163,937	\$506,258
Triplex	62	186	13,372	\$4.05	\$21.76	\$1.98	\$3,015	\$48,572	\$26,531	\$78,118
Quadplex	88	352	21,804	\$4.05	\$22.20	\$1.98	\$4,279	\$93,757	\$43,261	\$141,298
5+ Units	225	10,741	633,977	\$4.05	\$18.66	\$1.98	\$10,953	\$2,405,218	\$1,257,877	\$3,674,048
Mobile Home Park	5	565	18,556	\$4.05	\$18.62	\$1.98	\$243	\$126,228	\$36,817	\$163,288
Dormitory-Style Housing (per bed)										
Subtotal MF	2,228	14,385	833,643				\$108,345	\$3,262,899	\$1,654,035	\$5,025,279
Total Residential	15,547	27,726	2,049,542				\$755,991	\$7,498,108	\$4,066,504	\$12,320,604
Commercial										
Office/Retail	249	249	93,206	\$4.05		\$4.49	\$12,096	\$0	\$418,825	\$430,921
Laundry	3	3	4,840	\$4.05		\$4.68	\$146	\$0	\$22,646	\$22,792
All Other	159	159	70,459	\$4.05		\$4.70	\$7,744	\$0	\$331,254	\$338,998
Conv. Hospital	2	2	12,020	\$4.05		\$5.03	\$97	\$0	\$60,465	\$60,563
Auto/Service Station	50	50	17,604	\$4.05		\$5.44	\$2,431	\$0	\$95,853	\$98,284
Restaurants	89	89	75,503	\$4.05		\$8.01	\$4,316	\$0	\$604,689	\$609,005
Subtotal Commercial	552	552	273,632				\$26,830	\$0	\$1,533,733	\$1,560,563
**Inside City Revenue	15,781	27,945	2,242,430				\$767,390	\$7,392,648	\$5,440,034	\$13,600,072
<i>% Total</i>										

*Reflects prior year water use November - February*3. Residential use is subject to a cap.

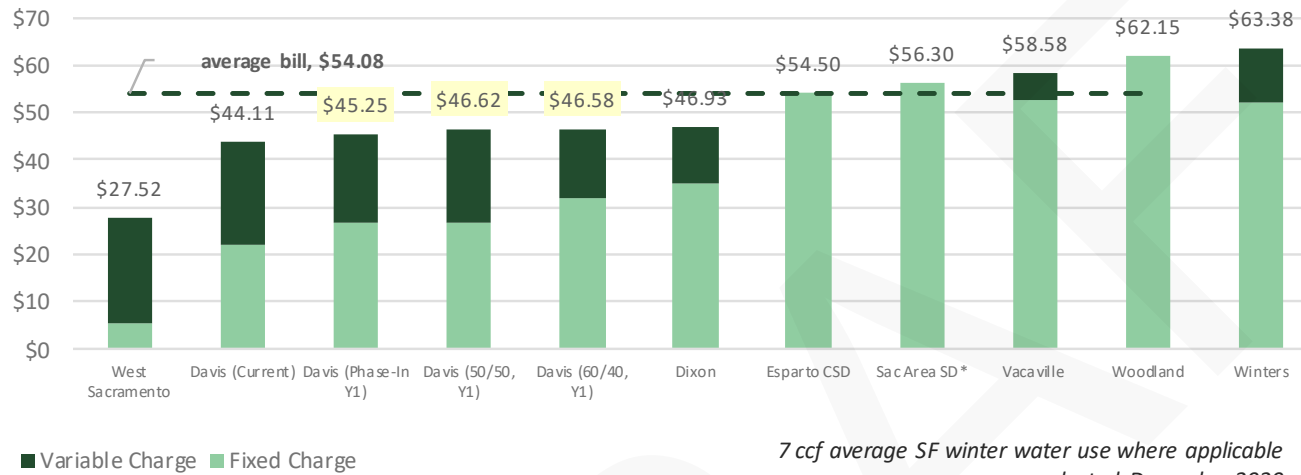
**Does not include irrigation accounts or city accounts inside the City, El Macero and North Davis Meadows accounts outside city (billed separately)

Table S21: Revenue Check

City of Davis

Draft Wastewater COS Rate Study 2021

Single Family Wastewater Monthly Bill Survey FY 2021



Single Family Bill Survey, Fixed & Variable Charges

