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Wastewater Extra-Strength Charges Cost of Service Study

Final Report

Prepared for:



CLACKAMAS



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2024 Extra-Strength Sewage Charges Cost of Service Analysis and Review of Billing Policies and Procedures

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Executive Summary

The purpose of this study is to provide a thorough review of the policies and procedures used by Water Environment Services (WES) to charge industrial customers that discharge high strength wastewater into the wastewater collection and treatment systems owned and operated by WES. This study focuses on the following key items:

- 1. How is WES charging industrial extra strength customers now?
- 2. What are the industry practices and standards for charging industrial strength customers?
- 3. Are there any changes that should be made to current policies and procedures that will enhance customer service, increase rate equity, and boost business efficiency?

WES was created in August, 1984, to administer several county service districts formed under ORS Chapter 451. The enabling legislation establishes county service districts as independent municipal corporations authorized to provide specific services within specified boundaries in Clackamas County. The Board of County Commissioners (BOCC) is designated as the governing body with the County Administrator serving as the Administrator of the Districts.

In November of 2016, the BOCC in their capacity as directors of the Tri-City Service District (TCSD), and Clackamas County Service District No. 1 (CCSD1) created an intergovernmental partnership for the delivery of wastewater collection and treatment services. This municipal partnership is called WES. In May of 2017, that partnership agreement was amended to include the Surface Water Management Agency of Clackamas County (SWMACC). WES' formation enables more efficient and cost-effective delivery of wastewater and surface water services on a regionalized basis. At the time of formation, the BOCC created rate zones. As of today, there are three (3) rate zones within WES. Rate zone 1 is coterminous with the boundaries of TCSD. Rate zone 2 is coterminous with the boundaries of CCSD1, and rate zone 3 is coterminous with SWMACC.

The scope of this extra strength cost of service study update is limited to industrial customers charged by WES in rate zones 1 and 2. As of this report's date, there are two (2) industrial customers in rate zone 1, and five (5) industrial customers in rate zone 2.

How is WES charging industrial extra strength customers now?

Regulation of industrial extra strength customers that discharge wastes into Publicly Owned Treatment Works (POTW's) is mandated by the Clean Water Act, and its implementing regulations at Title 40 of the Code of Federal Regulations, Parts 122, 123, 124, 403, and Chapter I, subchapter N. As a result of these federal regulations, WES implemented an industrial pretreatment program in 1986. Direct services provided by the program include industrial permitting, facility inspections, sampling, laboratory analysis and enforcement. Indirect services include development of local limits, updating rules and regulations, load investigations, responding to regulatory authorities and conducting industrial surveys. Staff inspects the industrial pretreatment processes of businesses to eliminate illegal discharge of harmful chemicals into the sewage treatment process and collects wastewater samples to ensure industrial compliance with federal and state environmental regulations and local wastewater ordinances.

The policies and procedures that are followed by WES' industrial pretreatment staff are codified in the Rules and Regulations of WES last updated in April, 2023. All non-residential wastewater customers are subject to evaluation to determine if they are required to pay an extra strength charge. Non-residential wastewater customers whose wastewater discharges exceed or have the potential to exceed residential

levels of Biochemical Oxygen Demand (BOD) or Total Suspended Solids (TSS) are required to pay an extra strength charge in an amount established by WES for each respective rate zone. The purpose of the extra strength charges is to recover the cost of treating extra strength wastewater discharged into the wastewater system of WES. Extra strength discharges have a concentration of BOD or TSS higher than the concentration assumed as part of the residential wastewater user charge. Additional charges to ratepayers for extra strength wastewater is necessary for rate equity and to prevent the high cost of treatment of extra strength wastewater from being passed on to all other ratepayers.

WES bills rate zone 1 and 2 sanitary sewer customers on the basis of Equivalent Dwelling Units (EDU) rather than on metered water consumption. Section 1.1 of the WES rules defines the EDU as follows:

Equivalent Dwelling Unit, or EDU. A unit of measurement of sewer usage which is assumed to be equivalent to the usage of an average dwelling unit. Equivalent Dwelling Unit (EDU) has the following definition for the purposes listed below:

- (a) User Charge. A unit, based on water consumption and strength of sewage of a single dwelling unit, by which all users of the sanitary sewers may be measured. Where unit equivalency must be computed it shall be equivalent to (a) 1,000 cubic feet of water consumption per month; (b) 0.449 pounds of BOD per day; and (c) 0.449 pounds of suspended solids per day.
- (b) System Development Charge. A unit, based upon a single dwelling unit or its equivalent, for connecting to the District sewerage system.

An industrial extra strength customer is billed for any flows and loads that exceed the assumed EDU thresholds established in section 1.1 of the rules. The specific policies and procedures for calculating the amount of the extra strength charges for customs is codified in section 5.8.4 of the rules, and shown below:

An industrial waste user charge will be applied to each class of Industrial User as defined in Table 2. The user charge shall be composed of rates for the customer's proportionate contribution of flow, TSS, and BOD that are in excess of domestic sewage contributions.

Rates for industrial flows shall be based on the EDU calculation, as determined by metered water consumption. Rates for TSS and BOD removal shall be based on the actual treatment cost per pound incurred by the District, including administrative overhead, operation, maintenance, and other expenses as established by the District. The user charge shall be based on simultaneous monitoring of flow, TSS, and BOD concentrations measured at the customer's property and the POTW periodically during the preceding 3-month period. Quarterly adjustments may be made to reconcile differences in projected versus actual conditions.

Such user charges shall be payable from the date of connection to the District or city sanitary sewer system or from the date on which the property owner is required to connect to the District or city sanitary sewer system, whichever occurs first.

Observations & Conclusions on Existing Extra Strength Charging Practices

The principal driver for billing industrial extra strength customers, and for that matter, all customers is the definition of an EDU. For billing purposes, WES defines an EDU as follows:

"1 EDU per each 1,000 cubic feet or fraction thereof per month of metered water consumption"

The 1,000 cubic foot assumption for monthly wastewater flow is in our opinion very high and should be revisited for accuracy. Analytical work done by us in other Portland area jurisdictions indicate the EDU flow standard is 590 cubic feet per month. Clearly this issue is moot for the single-family residential customer, but it has significant financial implications for non-residential customers that are billed on assumed flow and load. It is our understanding that WES management is studying this issue as part of the comprehensive rules and regulations update.

Prior to the 2016 extra-strength cost of service study, WES industrial pretreatment technical staff were taking section 5.8.4 of the rules very literally. Considerable time and effort were put forth to capture monthly treatment cost data. This tedious effort culminated in quarterly changes to the BOD and TSS rates. This resulted in significant swings in the quarterly rates charged to customers. The results of the 2016 cost of service study concluded this effort was not necessary, and not in line with industry practice. All the jurisdictions that were surveyed set their extra strength charges on an annual basis (at budget time) and keep them at those levels throughout the fiscal year. Our 2024 analysis reaffirms this conclusion, and we recommend updating the 2016 rates with the new rates calculated herein.

Finally, the extra strength charges that were calculated in the 2016 study, are unique to TCSD and CCSD1. For this 2024 study, we recommend WES move to unified rates for the entire WES sanitary sewer service area. The current service district-specific rates and the proposed new unified WES rates are still significantly below the average rates charged by the Northwest jurisdictions we surveyed. The data from our survey, and the proposed cost of service-based rates are shown below in Table 1. The details of our cost of service analysis and the industry survey are expanded upon in the body of this report.

Water Environment Services												
2024 Extra St	2024 Extra Strength Cost of Service Study											
Market Sur	Market Survey of Extra Strength Rates											
Biochemical Oxygen Demand Total Suspended Solid												
		Threshold		Threshold								
Jurisdiction	\$/lb	mg/l	\$/lb	mg/l								
Northwest POTWs:												
Portland (Bureau of Environmental Services)	\$ 0.828000	300	\$ 1.198000	350								
Clean Water Services (Washington County)	\$ 0.190000	800	\$ 0.280000	400								
Canby	\$ 1.180000	300	\$ 1.180000	300								
Gresham	\$ 0.640000	400	\$ 0.630000	400								
Salem	\$ 0.409840	300	\$ 0.369580	300								
Eugene & Springfield (MWMC)	\$ 1.059715	400	\$ 1.059715	400								
Seattle	\$ 0.441900	300	\$ 0.471500	400								
Vancouver, Washington	\$ 0.581200	200	\$ 0.554000	200								
Simple average - other communities	<u>\$ 0.666332</u>		<u>\$ 0.717849</u>									
Water Environment Services:												
Current charges per 2016 COSA												
Rate Zone 2	\$ 0.242100	219	\$ 0.149000	219								
Rate Zone 1	\$ 0.167500	219	\$ 0.145700	219								
Proposed WES unified charges												
WES	\$ 0.341780	219	\$ 0.241660	219								

Table 1 - Extra Strength Charges from the Industry Survey and the Proposed Cost of Service Rates for WES

What are the industry practices and standards for charging industrial strength customers?

There are three principal methods in use to bill for industrial extra strength Customers. All of these methods are rational and have stood up to legal challenges. These three methods are described below:

1. *Excess of Domestic Strength Method* – This is the method currently in use by WES. As discussed above, this method starts billing customers for extra strength whenever that customer's flows and load exceeds the defined level of domestic strength wastewater. In the case of the Service Districts, the trigger points for billing are:

(1,000 cubic feet of flow per month + .449 pounds of BOD per day + .449 pounds of TSS per day)

2. *Threshold of Strength Method* – This is the most prevailing billing method used in the industry, and least controversial. Under this method, the customer does not start getting billed for extra

strength until his/her <u>average monthly</u> strength of discharge reaches a specified threshold above the standard for domestic strength wastewater. Generally, domestic strength wastewater is assumed to consist of 200 milligrams per liter of BOD, and 200 milligrams per liter of TSS. Jurisdictions like Portland's Bureau of Environmental Services set their extra strength billing thresholds at 300 milligrams per liter BOD, and 350 milligrams per liter TSS. This higher threshold is in favor of the customer, and discounts daily variations in the strength of discharges, and really focuses on the average monthly load placed on the treatment system.

3. Classification Method – Under this method, classes of non-residential customers are established. Generally, they range from low, medium, high, and very high strength discharge classes. The City of Eugene uses this method and does not have a specific schedule of extra strength charges. Under their program, a monitored customer's flow and average load are observed over a sample period. The results of the sampling period determine what billing class that customer is assigned to. That customer will stay in that billing class until the next sampling period is set by the City (in some cases the customer is never sampled again). This method is rather simple to administer, and billing can be completely automated. Shown below in Table 2 is the current schedule of wastewater rates for the City of Eugene

Commercial / Industrial Customers										
		Low	Medium	High	Very High	Super High				
	Residential	ntial Strength Strer		Strength	Strength	Strength over				
Service Category	Customer	400*	800*	1,200*	1,600*	1,600*				
MWMC	\$3.016	\$4.055	\$5.906	\$8.381	\$10.863	\$13.339				
City of Eugene	\$3.020	\$3.020	\$3.020	\$3.020	\$3.020	\$3.020				
Total	\$6.036	\$7.075	\$8.926	\$11.401	\$13.883	\$16.359				
*Combined biochemical oxygen demand and suspended solids in milligrams per liter (mg/L)										

Table 2 City of Eugone	Wastowator Flow Based	Eco (por 1 000	allone) Effective	101/2 1 2022
Table 2 - City of Eugene	Wastewater Flow-Daset	1 i ee (per 1,000	gallons) Ellective	July 1, 2023

Observations & Conclusions on Industry Practice of Charging for Extra Strength Customers

WES charges its extra strength customers based on the strict "Excess of Domestic Strength" method. This method has been in place since the inception of the industrial pretreatment program back in 1986 and has served WES well. This method is rational, and defensible. There is no reason to change billing methodologies. However, as we discussed above, the assumption of 1,000 cubic feet of monthly wastewater flow as the basis for the EDU definition needs to be revisited in our opinion. If WES wants to move off of the current billing methodology, we suggest they move to the "threshold of strength" method. This method is more customer friendly, and perhaps a bit easier to administer for WES staff.

Are there any changes that should be made to current policies and procedures that will enhance customer service, increase rate equity, and boost business efficiency?

The extra strength billing policies and procedures currently in force are rules based and in compliance with industry standards. However, there are issues that need to be addressed by senior management. The key issues that we have identified in this cost of service study, and our recommendations for corrective action are shown below in Table 3

Table 3 - Policies and Procedures Issues and Recommended Action Items

	Policy or Procedure Issue	Recommended Action Item					
•	The current extra-strength charges are different for customers located in rate zones 1 and 2. Based on our analysis, if WES moves to a unified set of extra-strength charges, the two (2) customers in rates zone 1 will see a significant increase in their monthly sewer bills.	•	Move the existing extra-strength customers to the cost of service based unified WES rates calculated in this study. Consider phasing in the increases to the two (2) extra-strength customers in rate zone 1. Initiate a customer outreach for all seven (7) existing extra strength customers and keep them in the loop.				
•	The current definition of an EDU at 1,000 cubic feet of wastewater flow per month is significantly higher than what is observed in other Portland area communities.	•	Implement a study of single-family residential winter water consumption in the Service Districts to recalibrate the flow component of the EDU definition.				
•	The current definition of strength of discharge for an EDU at .449 pounds per day of BOD and TSS equates to 218.92 milligrams per liter.	•	218.92 milligrams per liter is within the industry relevant range of 200 milligrams per liter definition for domestic strength wastewater. We suggest WES move to the threshold of strength billing method for its monitored extra strength customers. Under this method the high strength charges would not apply to a customer's monthly measured discharge until the average monthly strength exceeds the threshold limit of 350 mg/l BOD and 350 mg/l TSS.				
•	The current "excess of domestic strength" billing methodology is rational and defensible.	•	Stay with the current billing methodology that is in the rules. However, if you want to move to a more customer friendly method, go to the "threshold of strength" method as used by the City of Portland.				

- Extra strength customers are currently being billed with an off line spreadsheet-based program. This quasi manual system is subject to data entry errors.
- Work on finding a way to get extra strength billing a part of the standard automated billing procedure (i.e., on the INCODE billing system).



Analysis Section

Who are the Extra Strength Customers Served by WES?

Currently, WES has identified and serves seven (7) industrial extra strength customers through its industrial pretreatment program. Generally, these are large businesses that have been in the program for many years. As of February, 2025, the seven industrial extra strength customers are:

Rate Zone 2

- FCC/Forum Clackamas Campus (formerly Safeway Distribution Center and Bread Plant, Clackamas)
- Kroger Fred Meyer Bakery, Clackamas
- Pacific Seafood, Clackamas
- Interstate Meats, Clackamas
- Agrinos Inc, Clackamas

Rate Zone 1

- Del-Mesa Farms, Inc., Oregon City (Foster Farms Chicken)
- Larsen's Creamery, Clackamas

Neighboring Communities Rates – Survey Methodology

Federal rules mandate that POTWs must monitor the point sources of pollutants entering their wastewater collection systems. Our survey of industry POTWs with active industrial pretreatment programs focused first on the Portland area, second on other large Oregon communities, and finally, on large Washington State cities/regional purveyors. The survey was done via telephone contact, and where appropriate, via internet queries. All of the rate data collected in this survey reflect rates as of February, 2024. In all likelihood, the rate data compiled in our "snapshot" survey will change in the next budget cycle. Figure 1 contains scatter diagrams of the survey rates for BOD and TSS plotted against the threshold at which the extra strength billing is initiated.



Figure 1 - Scatter Diagram of Survey Results for Extra Strength Charges



As the scatter diagrams show, there is significant variations not only in the rates charged by the service providers in the survey, but the thresholds from which the extra strength billing starts. What the survey tells us is there is not any meaningful measure of central tendency in the data. There is no single industry standard for charging for extra strength wastewater customers. But for a point of reference, we see that the simple average rates charged by the service providers in the survey calculate out to \$0.67 milligram per liter BOD and \$0.72 milligram per liter TSS. The raw survey data and the averages are shown below in Table 4.

	Biochemical Ox	ygen Demand	Total Susper	nded Solids
		Threshold		Threshold
Jurisdiction	\$/lb	mg/l	\$/Ib	mg/l
Northwest POTWs:				
Portland (Bureau of Environmental Services)	\$ 0.828000	300	\$ 1.198000	350
Clean Water Services (Washington County)	\$ 0.190000	800	\$ 0.280000	400
Canby	\$ 1.180000	300	\$ 1.180000	300
Gresham	\$ 0.640000	400	\$ 0.630000	400
Salem	\$ 0.409840	300	\$ 0.369580	300
Eugene & Springfield (MWMC)	\$ 1.059715	400	\$ 1.059715	400
Seattle	\$ 0.441900	300	\$ 0.471500	400
Vancouver, Washington	\$ 0.581200	200	\$ 0.554000	200
Simple average - other communities	<u>\$ 0.666332</u>		<u>\$ 0.717849</u>	

Table 4 - 2024 Extra Strength Charges Survey Data

The Current Definition of an Equivalent Dwelling Unit

As discussed in the Executive Summary, the 1,000 cubic foot assumption for monthly wastewater flow is in our opinion very high and should be revisited for accuracy. Analytical work done by us in other Portland area jurisdictions indicate the EDU flow standard is more like 590 cubic feet per month. Clearly this issue is moot for the single-family residential customer but is has significant financial implications for non-residential customers that are billed on assumed flow and load. Shown below is actual winter monthly average water consumption for single family residential customers in Portland area jurisdictions.

	Monthly	Observation Period
Community	Winter Average (CCF)	November - April
Gladstone	5.50	2003 - 2004
Molalla	6.13	2004 - 2005
Silverton	5.95	2011 - 2012
Oak Lodge Sanitary District	6.60	2003 - 2004
Gresham	5.83	2011 - 2012
Gresham	5.82	2012 - 2013
Gresham	5.76	2013 - 2014
Average	5.94	

We suggest WES implement a study of single-family residential winter water consumption in the rate zones to recalibrate the flow component of the EDU definition.

Cost of Service Analysis

Background and Study Methodology

To pay for the operation, maintenance, replacement, and improvement of the wastewater systems, the WES charges its customers fees on a monthly basis. The purpose of this study is to evaluate the methodology for calculating a unique set of fees; specifically, extra strength charges expressed in units of dollars per pound. The process used to prepare the COSA follows standard ratemaking principles, as outlined by the Water Environment Federation (WEF) and the U.S. Environmental Protection Agency (EPA). This process consists of the following steps:

- 1. Determine revenue requirements ... (how much does it cost to provide services system-wide).
- 2. Classification of wastewater treatment revenue requirements to functions. WEF and EPA methods classify wastewater system costs according to flow (annual average and wet weather), BOD, TSS, and customer services. Costs are classified among these service characteristics so they may then be allocated to customer classes in proportion to system demands. The result of the classification process is to determine the total cost of BOD and TSS removal for the fiscal year ended June 30, 2023
- 3. Calculation of total pounds of BOD and TSS removed in the wastewater treatment process over the period of study. In this case that period of study is fiscal 2022-23 (i.e., July 1, 2022 through June 30, 2023).
- 4. Determine rate per pound for BOD and TSS removal (align rates to recover costs from those causing the need). These unit costs of solids removal are then charged to customers in proportion to their assumed or measured strength of discharge into the systems.

The data sets and calculations that are used to work through these steps are shown in Appendix A. A detailed discussion of the methodological steps follows.

Step 1: Determination of Revenue Requirements

Revenue requirements are the total costs of providing services to utility customers over a specific period of time (usually one year). These costs include operation and maintenance (O&M) and capital costs. O&M costs are the routine costs of operating and maintaining a utility system in order to provide service. For the purpose of rate setting, revenue requirements are projected from budgeted expenses, and adjusted based on historical cost trends and the expertise of utility staff. Examples of O&M costs are chemicals and electricity used at plants, skilled plant operator labor, and administrative expenses.

Capital costs, as defined for wastewater rates, are the resources used to acquire or construct capital assets. These include current revenue funded (pay-as-you-go) improvements, planned annual contributions to funds for such purposes, and ongoing debt service requirements (principal and interest payments on outstanding loans and other obligations). Capital assets are defined as major assets that benefit more than a single fiscal period. Typical examples are land, improvements to land, easements, buildings, building improvements, vehicles, machinery, equipment, and other infrastructure. Capital costs are projected for the rate-setting period based on the capital improvement plan, WES's bond covenants and utility staff expertise.

To determine the amount of revenue that rates must generate annually, the total revenue requirements are reduced by non-rate or other system revenues. Examples of other system revenues are unrestricted interest earnings, revenues from wholesale contract customers, and revenue from miscellaneous charges. Total requirements less other system revenues equal requirements from rates.

Step 2: Classification of Wastewater Treatment Revenue Requirements to Functions

Determination of the costs-of-service by customer class is a four-step process. These steps are referred to as functionalization, joint and specific groupings, classification, and allocation. Functionalization involves categorizing revenue requirements according to utility functions. Wastewater functions typically include treatment (often broken up by unit process), collection, pumping, and customer service. Utilities incur varying levels of costs to perform the different system functions needed to meet customer demands. Therefore, the first step in the cost allocation process is to determine what it costs the utility to perform different service functions. Next, functional costs are grouped by joint and specific categories. This process allows for certain types of costs (e.g., industrial pretreatment costs) to be allocated directly to benefiting customers. The majority of costs are generally joint or common to all customers.

Following functionalization and joint and specific groupings, a classification process is undertaken. A fundamental objective in developing a rate system is to price utility services so that each customer pays for the service they receive in proportion to their use. Some costs incurred by the utility are a function of the quantity of wastewater discharged by customers. Other costs are associated with serving customers regardless of the quantity that flows through the system. WEF and EPA methods classify wastewater system costs according to flow (annual average and wet weather), biochemical oxygen demand¹ (BOD) loadings, total suspended solids² (TSS) loadings and customer services. Costs are classified among these service characteristics so they may then be allocated to customer classes in proportion to system demands.

The cost of service analysis is intended to provide the analytical basis for equitably recovering the forecasted revenue requirement from customer classes according to the demand they place on the wastewater system. Consistent with industry practice, the analysis involves a two-step process; first, capital and O&M costs are allocated to the functional categories (service functions) of the wastewater system using operational and system design criteria. Then, based on customer class characteristics derived from historical billing system data (i.e., number of customers and monthly water usage), these functionally allocated costs are distributed to the customer classes.

Cost of service allocations are made for a test year considered representative of the period in which proposed rates are expected to be in effect. In this case, the fiscal 2022-2023 actuals is the test period.

Functional Cost Allocations

Capital and operating costs are allocated to the following functional components of the wastewater system. The wastewater functional components and their descriptions are shown in Table 5.

¹ BOD is the quantity of oxygen used in the biochemical oxidation of organic matter in a specified time and at a specified temperature.

² TSS are solids that float on the surface of, or are in suspension in wastewater or other liquids, and are largely removable by laboratory filtering.

Table 5 - Wastewater System Functional Components

Wastewater Functional	
Component	Description
Customer Accounts	Costs associated with providing service to customers regardless of the level of wastewater contribution, such as billing and customer service. These costs are typically associated with the number of accounts or customers.
Wastewater Flow (Q)	Costs are associated with conveying and treating customer contributed wastewater flow (volume).
Infiltration & Inflow (I&I)	Costs are associated with conveying and treating I&I of groundwater and stormwater runoff into sanitary sewers.
Strength of Discharge	Costs are associated with treating effluent loadings of biochemical oxygen demand (BOD) and total suspended solids (TSS).

Capital related costs include debt service payments, system reinvestment funding, and a portion of additions/uses of cash reserves. The most common method of assigning the capital portion of the revenue requirement to functional components is to allocate such costs on the basis of existing plant-in-service. The allocation of historical plant assets utilizes documented engineering and planning criteria from WES and industry standards. The following assumptions were applied in the process:

- System peak day to average day flow ratio is estimated for each wastewater treatment plant, and is derived by dividing historical peak flow by average daily flow, as reported to the Oregon Department of Environmental Quality by WES. This factor is used to allocate volume related costs between customer contributed flow and I&I cost components.
- Treatment related costs are allocated to flow, I&I, BOD, and TSS based on a 60/40 split between volume and strength costs, with volume costs further split between flow and I&I using the peak to average day ratio, and strength costs further split between BOD and TSS on a 50/50 basis.
- Collection system costs are allocated to customer accounts (25%) to recognize that local collection mains are a function of the number of connections on the system, with the remainder allocated to flow and I&I based on the peak to average day ratio.
- General plant is allocated in proportion to all other infrastructure costs.

Operating costs include O&M expenses and a portion of additions/uses of cash reserves. These costs are allocated to the functions based on a detailed review of line item categories, generally following the cost causation process used in the allocation of plant. For example, customer billing related costs are assigned to the customer component; system operating costs for collection and treatment are allocated in the same manner as collection and treatment plant costs; other operational costs are assigned in proportion to total plant; and general and administrative costs are allocated in proportion to all other costs.

The functional cost allocation process results in a pool of costs for each functional category. From these cost pools, unit costs are created that form the building blocks for designing rate structures that recognize the demands of each customer class. As a result, costs will be recovered from customer classes based on their demand by functional category. Through this process if one customer class places a higher or lower proportional average demand in one functional category, that customer class pays a higher or lower portion of that functional category's cost.

Step 3: Calculation of Total Pounds of BOD and TSS removal in Fiscal 2018-19

The total amount of solids removed from wastewater is based on the difference between influent and effluent concentrations, generally expressed in milligrams per liter. WES does not weigh or otherwise measure the pounds of BOD and TSS removed. Therefore, a mass balance analysis of the total influent and effluent flows at the wastewater treatment plants was done by WES scientists to estimate the total pounds of BOD and TSS removed from wastewater treated in fiscal year 2022-23. The results of that mass balance analysis are shown below in Table 6.

	Pounds of Solids Removed in FY 2022-23										
WWRF	BOD	TSS	Plant Totals								
Raw DMR data mass balance											
Kellogg Creek	5,613,841	8,233,496	13,847,338								
Tri-City	9,412,965	12,131,778	21,544,743								
WES totals	15,026,806	20,365,274	35,392,080								

Table 6 - Total Pounds of BOD and TSS Recovered in Fiscal Year 2018-19

Step 4: Determine Rate Structure and Develop Rates

The last step in the rate development process is the design of the rate structure and the development of rates. There are a variety of rate structure options available to meet a wide range of policy objectives. In this case, it is a fairly simple calculation. The numerator consists of the fiscal year 2022-23 actual program costs assigned to BOD and TSS divided by the calculated pounds of BOD and TSS removed from treated wastewater in fiscal 2022-23. The resulting rates expressed in dollar per pound.

Appendix A

Appendix A - Extra Strength Charges Calculations for Water Environment Services

	Fiscal 2022-
Line Item Description	23 Actuals
Gross Revenue Requirements:	
Materials and services	\$ 22,564,628
Special payments	1,149,866
Transfers:	
Construction fund	21,863,302
SDC fund	-
Debt service fund	1,636,698
Subtotal Gross Revenue Requirements	\$ 47,214,494
Non-Rate Revenue Offsets:	
Wastewater Permits	\$ 45,625
Fees - Collected for Other Age	761,596
Miscellaneous Fees	93,089
Review Fees	89,075
System Development Charges	25,050
Penalties	1
Interest Income	332,905
Assessment Principal	8,741
Assessment Interest	712
Miscellaneous Revenue	191,937
Rent & Lease Income	74,220
Asset Sale Proceeds	80,791
Loan-Repayment Principal	2,069
Loan-Repayment Interest	569
Construction Transfer Adj	-
subtotal Non-Rate Revenue Offsets	\$ 1,706,380
Net Revenues Required From Rates	\$ 45,508,115

Step 1 – Determination of Total System Revenue Requirements for WES in Fiscal Year 2022-23

Source: WES Staff accounting records

Step 2: Classification of Wastewater Treatment Revenue Requirements to Functions

Step 2A: Determination of the Book Value of Utility Plant-in-Service by Wastewater System Category

Sum of NE	8V		Fund 📑	WW SystemCa 🍸	WW System Ca				
							Sanitary Sewer		
			⊟ 631	631	631	631	Total	Surface Water	Grand Total
			⊟1	Ξ2	= 3	⊟4			
Account	Category	Profile Description	Collection	Treatment	General Plant	Cust. Accts.			
E 15020	E LAND	Gen Plant - Misc Equipment	61,228	97,450			158,678	728,900	887,578
15020	LAND	Land - Collection Plant	540,522				540,522	3,869,063	4,409,585
15020	LAND	Land - General Plant			330,513		330,513		330,513
15020	LAND	Land - Pumping Plant	767,765				767,765		767,765
15020	LAND	Land - Treatment Plant		1,863,870			1,863,870		1,863,870
15020	LAND	Land & Improvement - Collection						90,449	90,449
15020	LAND	Land & Improvement - Gen Plant						140,193	140,193
15160	🗏 INTAN	Gen Plant - Misc Equipment		-	-			-	-
15160	INTAN	Gen Plant - Other Intangible		6,488			6,488	15,532	22,021
15160	INTAN	Intangible Assets - Software	-	-	8,389		8,389		8,389
15180	E TPLNT	Buildings - Treatment Plant		22,252,233	1,946		22,254,179		22,254,179
15180	TPLNT	Gen Plant - Misc Equipment		9,470,665			9,470,665		9,470,665
15180	TPLNT	Land & Improvement - Treatment		5,726,740			5,726,740	296,298	6,023,039
15180	TPLNT	Treatment Plant - Equipment		19,322,878	19,848		19,342,725		19,342,725
15180	TPLNT	Treatment Plant - Misc		9,065,364	14,877		9,080,241		9,080,241
15180	TPLNT	Treatment Plant - Outfall		1,072,706			1,072,706		1,072,706
15180	TPLNT	Treatment Plant - Sewers		176,357			176,357		176,357
= 15190	E CLLCT	Buildings - Collection Plant	184,742				184,742	11,095	195,837
15190	CLLCT	Collection Sewer - Force Mn	4,497,767				4,497,767		4,497,767
15190	СЦСТ	Collection Sewer - Gravity Ln	60,882,315				60,882,315	2,661,715	63,544,030
15190	СПСТ	Flow Measuring Devices	85,363	819,584			904,948	17,452	922,399
15190	CLLCT	Gen Plant - Misc Equipment	13,735,065			9,422	13,744,487	2,326,039	16,070,526
15190	CLLCT	Land & Improvement - Collection	28,959				28,959	1,494,651	1,523,610
15190	СЦСТ	Misc Equip - Collection Plant	72,016				72,016	12,412,570	12,484,586
15190	СЦСТ	Services to Customers						15,691	15,691
15190	сцст	Special Collection Structures	572,528				572,528	400,325	972,853
E 15200	E PPLNT	Buildings - Pumping Plant	293,589				293,589		293,589
15200	PPLNT	Gen Plant - Misc Equipment	780,690				780,690		780,690
15200	PPLNT	Land & Improvement – Pump Station	19,597				19,597		19,597
15200	PPLNT	Pumping Plant - Equipment	922,165	3,530,972			4,453,137		4,453,137
15200	PPLNT	Pumping Plant - Misc	452,816	980,080			1,432,896	9,924	1,442,820
15200	PPLNT	Pumping Plant - Receiving Well	379,980				379,980		379,980
= 15210	E GPLNT	Buildings - General Plant		488,278	-		488,278	23,296	511,574
15210	GPLNT	Gen Plant - Comm Equipment		159,300			159,300	-	159,300
15210	GPLNT	Gen Plant - Lab Equipment		356,746	41,624		398,370	27,738	426,108
15210	GPLNT	Gen Plant - Misc Equipment	100,396	4,752,570	245,026	-	5,097,992	162,137	5,260,130
15210	GPLNT	Gen Plant - Tools, Shop, Garage Equi	p	4,321			4,321		4,321
15210	GPLNT	General Plant - Furn & Equip		13,287	17,148	3,159	33,595	688	34,283
15210	GPLNT	General Plant - Power Equipment	348,350	6,587,692			6,936,042		6,936,042
15210	GPLNT	Land & Improvement - Gen Plant		1,564,641			1,564,641		1,564,641
1521.0	GPLNT	Transportation Equipment	364,734	183,537	1,201,155		1,749,426	-	1,749,426
Grand Tot	al		85,090,586	88,495,762	1,880,528	12,582	175,479,457	24,703,756	200,183,213
6/30/23 C	WIP		9,686,122	12,270,378	79,023		22,035,524	1,017,622	23,053,146
Totals			94,776,709	100,766,140	1,959,551	12,582	197,514,981	25,721,378	223,236,360

2024 Extra Strength Cost of Service Study Allocation of Utility Plant-in-Service													
			- ou c										
				Sew	er S	ystem Functi	ons						
Plant-in-Service Category	Book Value	Flow		1&1		BOD		TSS	Cust. Accts.		Joint Costs		Total
Collection plant	\$ 94,776,709	49.85%		25.15%		0.00%		0.00%	25.00%				100.00%
Treatment plant	100,766,140	39.88%		20.12%		20.00%		20.00%					100.00%
General plant	3,687,491										100.00%		100.00%
Customer accounts	12,582								100.00%				100.00%
Total plant-in-service	\$ 199,242,922	\$ 87,425,290	\$	44,116,924	\$	20,153,228	\$	20,153,228	\$ 23,706,759	\$	3,687,491	\$	199,242,920
Direct cost percentages		44.71%		22.56%		10.31%		10.31%	12.12%				
Allocation of Joint Costs		\$ 1,648,534	\$	831,891	\$	380,019	\$	380,019	\$ 447,027	\$	(3,687,490)		
Plant-in-Service Total	\$ 199,242,922	\$ 89,073,824	\$	44,948,815	\$	20,533,247	\$	20,533,247	\$ 24,153,786				
Allocation Methodology:													
Ireatment Plant	40% strength; 60%	flow (industry	sta	ndard):	14 - 1			••••••					
	May ma ava dail	flowmad	Iri	16 1900	<u>ke</u> l	0 8500	-						
	Average appual d	y now mgu		10.1000		9.8500		20.0500					
	Peaking factor	any now mgu		1.5322		1.4614		1.5046					
	Ū												
Collection Plant	25% customer acc	ounts; 75% flow	/ (in	dustry standa	ard)	:							
			Tri	City 2022-23	Kel	llogg 2022-23	(<u>Combined</u>					
	Max mo. ave. dail	y flow mgd		16.1800		9.8500		26.0300					
	Average annual da	aily flow mgd		10.5600		6.7400		17.3000					
	Peaking factor			1.5322		1.4614		1.5046					
Customer Accounts	100% to customer	accounts											
General Plant	Allocate based on	direct cost spre	ead	pattern									

Step 2B: Allocation of Utility Plant-in-Service to Wastewater System Functions

		FY 2022-23	Volume of Wastewater		Strength of Discharge		Customer				
			Fund 631 -								
			Sewer								
			Operating								
Expense Tyr 🝸	Account	Description	Actuals 🗾	Flow (Q) 💌	I&I 工	BOD 🗾	TSS 🗾	Accounts 🚬	Joint Cost 🗾	Total 🗵	Comment
PROGRAM	42010	Advertising/Marketing	50,944					100.00%	0.00%	100%	Allocate 100% to customer accounts
PROGRAM	42030	Banking & Merchant Fees	362,056					100.00%	0.00%	100%	Allocate 100% to customer accounts
PROGRAM	42080	Dues & Memberships	43,253						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42090	Employee Appreciation	4,018						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42100	Fees	117	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42110	Fees - Permits	215,260	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42150	Insurance - Liability	(29,171)						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42210	Miscellaneous Expenses	279,020	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42220	Office Supplies	24,670					100.00%	0.00%	100%	Allocate 100% to customer accounts
PROGRAM	42240	Postage/Shipping	87,445					100.00%	0.00%	100%	Allocate 100% to customer accounts
PROGRAM	42250	Printing & Copies	61,794					100.00%	0.00%	100%	Allocate 100% to customer accounts
PROGRAM	42270	Publications & Subscriptions	1,736	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42310	Telephone & Internet	210,784	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42320	Training & Development	68,216						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42330	Transportation - Mileage	463						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42340	Transportation - Other	198						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42350	Travel - Lodging Airfare Other	19,229						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	42400	Utilities - Electricty	1,437,812	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42410	Utilities - Gas	69,180	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42420	Utilities - Sewer	303,845	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42430	Utilities - Water	119,880	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	42440	Uniforms Clothing Expense	99,403	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43100	Professional Services	22,116	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43120	Architectual & Engineering Ser	227,322	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43130	Audit & Financial Services	93,418	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43140	Consulting Services	196,187	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43160	Contract Employees	9,442,835	44 710/	22 5 60/	10 210/	10 210/	12 120/	100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAIVI	43190	Environmental Services	1/2,/58	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAIVI	43220		88,001	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	43230	Lab Services	/2,541	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAIVI	43240	Legal Services	3,0/8	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAIVI	43260	Other Contracted Convices	3,778	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAIVI	43280	Utility Plant Convision	811,055			co. 00%	40.00%		100.00%	100%	Solid costs spread based on specific costs spread pattern
PROGRAIVI	43320	Supplies	747,718	44 719/	22 56%	60.00%	40.00%	12 120/	0.00%	100%	60% BOD, 40% ISS
PROGRAM	44100	Chamicals	90,730	44.71%	22.50%	10.51%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44110	Computer c ÉEK	1,590,029	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAIN	44120	Computer < 55K	27,000	44.71%	22.50%	10.51%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44140	Equipment & Furnishings < \$5K	2,045	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44130	Hospitality Event Supplies	1 242	44.71/8	22.30%	10.31%	10.31%	12.12/0	100.00%	100%	Light costs spread based on specific costs spread pattern
PROGRAM	44170	lanitorial Supplies	1,342	11 71%	22 56%	10 21%	10 21%	12 12%	0.00%	100%	Allocate based on total plant in service balance
PROGRAM	44100	Miscellanoous Supplies	1,555	44.71%	22.50%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44210	Office Euroiture < \$5K	3,270	-+-+. / 170	22.3070	10.31%	10.31%	12.1270	100.00%	100%	Init costs spread based on specific costs spread pattern
PROGRAM	44220	Darte	457	11 71%	22 56%	10 31%	10 31%	12 120/	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44240	Program Materials & Supplies	1/0	44.71%	22.50%	10.31%	10.31%	12.12/0	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44250	Shon Supplies	10 702	44.71% AA 71%	22.30%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
I NOONAIN		Such anthrea	10,798	++./170	22.30%	10.31%	10.31%	12.1270	0.00%	100%	should based on total plant-linservice balance

Step 2C: Classification of Wastewater Treatment Revenue Requirements to Functions

		FY 2022-23	Volume of	Nastewater	Strength o	ngth of Discharge Customer					
		Fund 631 -									
			Sewer								
			Operating								
Expense Tyr 🎽	Account	Description	Actuals 🗾	Flow (Q) 💌	I&I 💌	BOD 💌	TSS 🗾	Accounts 🝸	Joint Cost 💌	Total 💌	Comment
PROGRAM	44260	Safety Equipment & Supplies	68,906	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44280	Small Tools & Equipment < \$5K	63,828	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	44300	Training Materials	1,870						100.00%	100%	Joint costs spread based on specific costs spread pattern
PROGRAM	44310	Utility Plant Supplies	535,982	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45100	Repairs & Maintenance	319,192	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45120	Building Maintenance	1,727	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45130	Computer Hardware/Software Mai	228,919	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45160	Equipment Maintenance	19,406	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45170	Grounds Maintenance	2,032	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45200	Park Maintenance	12	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	45260	Vehicle Repair & Maintenance	1,906	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	46130	Rental - Equipment	88,154	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	46135	Rental - Equipment Pool	769,288	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
PROGRAM	47110	Division Indirect Costs	(122,981)						100.00%	100%	Joint costs spread based on specific costs spread pattern
ALLOCATED OV	42150	Insurance - Liability	86,072						100.00%	100%	Joint costs spread based on specific costs spread pattern
ALLOCATED OV	42160	Insurance - Property	303,339						100.00%	100%	Joint costs spread based on specific costs spread pattern
ALLOCATED OV	43160	Contract Employees	2,067,257						100.00%	100%	Joint costs spread based on specific costs spread pattern
ALLOCATED OV	43280	Other Contracted Services	1,266,560						100.00%	100%	Joint costs spread based on specific costs spread pattern
ALLOCATED O	46150	Leases - Office	254,212						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	42170	Insurance - Vehicle	63,482						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	44150	Fuel	155,730						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	45100	Repairs & Maintenance	9,492						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	45260	Vehicle Repair & Maintenance	182,649						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	46139	Equipment Pool Contra	(864,843)						100.00%	100%	Joint costs spread based on specific costs spread pattern
NON-PROGRA	48230	Vehicles	(0)						100.00%	100%	Joint costs spread based on specific costs spread pattern
		Subtotal - Materials and Services	22,564,628								

			FY 2022-23	Volume of V	Nastewater	Strength o	f Discharge	Customer			
			Fund 631 -								
			Sewer								
			Operating								
Expense Tyr 💌	Account	Description	Actuals 💌	Flow (Q) 💌	I&I 💌	BOD	TSS 💌	Accounts 🔻	Joint Cost 🔻	Total 💌	Comment
SPECIAL PAYM	ENTS		1,149,866	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
CAPITAL	48xxx		-	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
EQUIPMENT	48230		-	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
					22.554		10.010/	10.101/			
TRANSFERS		Construction Fund	21,863,302	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
TRANSFERS		SDC Fund	-	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
TRANSFERS		Debt Service Fund	1,636,698	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
		1									
RESERVES AND	CONTINGEN	CIES	-	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
		Subtotal Gross Revenue Requirements	47,214,494								
	3/1550-701vv	Wholesale Payments		11 71%	22 56%	10 31%	10 31%	12 12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	37250	Wastewater Permits	45 625	44.71%	22.50%	10.31%	10.31%	12.12/0	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	34300	Fees - Collected for Other Age	761 596	44 71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	34430	Miscellaneous Fees	93 089	44 71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	34520	Review Fees	89 075	44 71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	34590	System Development Charges	25.050	44 71%	22.56%	10.31%	10 31%	12 12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	35140	Penalties	(0)	44 71%	22.56%	10.31%	10 31%	12 12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	36110	Interest Income	332 905	44 71%	22.56%	10.31%	10 31%	12 12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	37110	Assessment Principal	8,741	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	37120	Assessment Interest	712	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	38100	Miscellaneous Revenue	191 937	44 71%	22 56%	10 31%	10 31%	12 12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	38150	Rent & Lease Income	74,220	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	39120	Asset Sale Proceeds	80,791	44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	39180	Loan-Repayment Principal	2,069	44,71%	22,56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	39190	Loan-Repayment Interest	569	44,71%	22,56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance
REVENUE OFFS	ETS	Construction Transfer Adj		44.71%	22.56%	10.31%	10.31%	12.12%	0.00%	100%	Allocate based on total plant-in-service balance

Water Environment Services Revenue Requirements Allocation Template - Wastewater											
	Functional Categories of Wastewater Service										
	Volume of	Wastewater	Strength o	f Discharge	Customer						
	Flow (Q)	1&1	BOD	TSS	Accounts	Joint Costs	Total				
Forecast Year: FY 2022/23 Gross Revenue Requirements											
Materials and services	3,337,443	1,684,155	1,217,976	1,068,433	1,491,910	13,764,710	22,564,628				
Special Payments	514,061	259,408	118,501	118,501	139,396	-	1,149,866				
Capital outlays	-	-	-	-	-	-	-				
Transfers	10,505,944	5,301,554	2,421,824	2,421,824	2,848,854	-	23,500,000				
Operating contingency	-	-	-	-	-	-	-				
Subtotal Gross Revenue Requirements	14,357,448	7,245,117	3,758,301	3,608,758	4,480,160	13,764,710	47,214,494				
Revenue Offsets:	762,856	384,956	175,853	175,853	206,861	-	1,706,379				
Direct revenue requirement	13,594,592	6,860,161	3,582,448	3,432,905	4,273,299	13,764,710	45,508,115				
add: allocated joint costs	5,894,945	2,974,732	1,553,436	1,488,591	1,853,006	(13,764,710)					
Net Revenues Required From Rates	19,489,537	9,834,893	5,135,884	4,921,496	6,126,305		45,508,115				

Step 2D: Summary of Classified Wastewater Treatment Revenue Requirements to Functions

Step 3: Calculation of Total Pounds of BOD and TSS removal in Fiscal Year 2022-23

	Pounds of Solids Removed in FY 2022-23								
WWRF	BOD	TSS	Plant Totals						
Raw DMR data mass balance									
Kellogg Creek	5,613,841	8,233,496	13,847,338						
Tri-City	9,412,965	12,131,778	21,544,743						
WES totals	15,026,806	20,365,274	35,392,080						

Step 4: Determine Rate Structure and Develop Rates

	BOD	TSS
Forecast Year: FY 2022/23		
Gross Revenue Requirements		
Materials and services	\$ 1,217,976	\$ 1,068,433
Capital outlays	-	-
Transfers	2,421,824	2,421,824
Operating contingency	 -	 -
Subtotal Gross Revenue Requirements	3,758,301	3,608,758
Revenue Offsets:	 175,853	 175,853
Direct revenue requirement	3,582,448	3,432,905
add: allocated joint costs	 1,553,436	 1,488,591
Net Revenues Required From Rates	5,135,884	4,921,496
Total Pounds of Solids Recovered:		
Kellogg Creek WRRF	5,613,841	8,233,496
Tri-City WRRF	 9,412,965	 12,131,778
Total WES pounds recovered	15,026,806	20,365,274
Unit rate per pound recovered in FY 2022-23	\$ 0.341780	\$ 0.241660

Water Environment Services Calculation of Unit Cost of Service Rates For Solids (\$/Pound)