LAKE OROVILLE AREA
PUBLIC UTILITY DISTRICT

WASTEWATER SYSTEM COST OF SERVICE

FINAL RATE STUDY REPORT

April 10, 2019

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RATE STUDY REPORT

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I. Executive Summary

Sauers Engineering, Inc. has been retained by Lake Oroville Area Public Utility District (LOAPUD) (District) to prepare an updated Cost of Service and Wastewater Rate Study (Study). The purpose of the Study is to look at all District operational expenses and provide recommendations for future rates that will insure the District meets all of its operational, maintenance, and administrative goals. The Study includes a thorough review of revenue requirements, cost of service allocations, and design of a system of user charges for the District's wastewater service consistent with State Water Resources Control Board (SWRCB) Revenue Guidelines and District policies.

The specific objectives of the Study included the following tasks:

- Inventory all of the District's existing infrastructure including gravity pipelines, manholes, lift stations, force mains, and septic tanks and pumping equipment. Inventory the District's equipment such as service vehicles, video inspection equipment, pipeline cleaning equipment, patching and repair systems, and construction equipment.

- Based on time of installation, types of materials, and/or original purchase date, determine the estimated service life and time of replacement for the District's existing facilities and equipment.

- Determine the current replacement costs for all of the District's facilities and equipment to be included in the rate analysis.

- Review historic data for the District's ongoing administration and operation and maintenance costs.

- Look at the number and classes of existing District customers and evaluate the impacts of any potential improvements to the system.

- Determine monthly sewer service charges that fully support operations and maintenance, replacement, capital improvements, and potential debt service costs.

- Prepare a report which presents the current rate information, recommended rates over the next five years, including methodology and supporting analysis, and connection fees for new customers.

- To be available to provide updates at regular District Board Meetings as well as provide a presentation of the final report and recommendations.

Review of Findings and Recommendations

The Board of Directors, at their April 9, 2019 Board Meeting, reviewed the rate study report and the options for rate increases over the next five fiscal years. The Board approved what is presented in Section XI of this report as Option 4 which includes:

Five Year Step Increase with Emergency Reserve:
$19.31/EDU/month for first year, annual $1.00/EDU/month increase
Increase of $2.76/EDU/month first year, 17%
Increase of $1.00/EDU/month for four years, 5%

II. Proposition 218 Requirements

Sewer Service Charge increases must comply with the provision of Article XIIID of the California Constitution (Proposition 218). Section 6(b) of Proposition 218 requires the local agency to meet all of the following requirements for all "existing, new or increased fees and charges. A fee or charge shall not be extended, imposed or increased by any agency unless it meets all of the following requirements:

(1) Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.
(2) 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.
(3) 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.
(4) No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question. Fees or charges based on potential or future use of a service are not permitted. Standby charges, whether characterized as charges or assessments, shall be classified as assessments and shall not be imposed without compliance with Section 4 [of Proposition 218].
(5) No fee or charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.

To impose an increased sewer charge, the District is required to:

- Mail information regarding the proposed fee to every property owner
- Conduct a public hearing at least 45 days after the mailing
- Reject the proposed fee if written protests are presented by a majority of the affected property owners

III. Introduction

In order for the District to continue to provide the high quality level of service its customers have come to expect, it must continue to perform maintenance, replacement, and new construction activities, especially given the age and condition of much of its facilities. Experience shows that the cost of these activities generally increases over time, as is reflected in the District's previous and current budgets. Ever increasing regulatory requirements are also creating new sources of expenditure for the District. In preparing its budget, the District routinely identifies areas of highest priority for maintenance and/or replacement activities and projects the amount of funding required. Because of the increase in fuel and construction material costs, along with ongoing regulatory, administration and overhead costs, an increase in expenditures must be matched by revenue. This increase is a reasonable reflection of the actual increases in the cost of providing necessary services.

The District is a single service provider which owns, operates, maintains, repairs, and constructs sewer collection and conveyance facilities. These activities involve the use of heavy equipment, construction materials such as pipe and concrete, and utilization of specialized construction techniques. These activities are very closely related to infrastructure construction projects such as pipelines and pump stations. The Engineering News Record (ENR) follows trends in the costs of construction labor and materials and publishes a Construction Cost Index that is widely used in the construction industry. Because of the type of service provided by the District, this index is more representative of the actual changes in costs of providing that service than a more general index such as the Consumer Price Index (CPI). The ENR Construction Cost Index is, therefore, a reasonable basis for determining subsequent rate increases and will be utilized in this report.

Collection System

The District's collection system consists of approximately 74 miles of gravity sewer pipeline ranging from 3-inch to 36-inch diameter and approximately 4.5 miles of force main. The force main inventory includes approximately 2.5 miles of force main from the District's lift stations and approximately 2 miles of small diameter pressure pipe within the Villa Verona STEP system. The collection system also includes approximately 1,753 manholes. Table III-1 shows the pipeline system inventory. There are also nine sewer lift stations in the system.

Table III-1
COLLECTION SYSTEM INVENTORY

Collection System Pipeline (3"-10", typ)	Collection System Manholes	Interceptor Pipeline (12"-30", typ)	Interceptor Manholes	Force Main (3"-8", typ)	Individual STEP Systems
348,128 ft. (65.9 mi.)	1,550	58,360 ft. (11.0 mi.)	203	23,760 ft. (4.5 mi.)	304

Customer Base

The District provides service connections to approximately 4,392 customers. Customers include single and multiple family residences, a variety of commercial uses, and public facilities including schools and recreational facilities associated with nearby Lake Oroville. For purposes of record keeping and billing, the District converts non-residential customers to equivalent dwelling units (EDU). This adjusts larger wastewater customers to the equivalent number of residential customers which generate the same quantity of wastewater. The District currently serves 6,152 EDU according to District records. Historically, the growth rate in the greater Oroville area has been approximately 1%. This factor will be used to project the future growth of EDU and revenue through service charges.

For the District, an EDU is defined in terms of volume of wastewater flow discharged or the number of plumbing fixture units, which equate to an EDU. The District's EDU are defined as follows:

- 210 gallons per day of wastewater flows = 1 EDU for single family residences
- Sixteen Plumbing Fixture Units = 1 EDU for non residential users

Wastewater Treatment and SC-OR

Since 1977, treatment and disposal of the wastewater conveyed through the District's collection system have been provided by the Sewerage Commission - Oroville Region (SCOR) regional treatment plant located west of the District's service area. The SCOR plant is operated through a Joint Powers Agreement (JPA) which also includes the City of Oroville and the Thermalito Water and Sewer District.

Sewer discharges within the District are not individually metered but a totalizing meter for all flows from within the District is located at the outfall of the District's State Line Interceptor. Based on the metered flows, LOAPUD prepares a statement and pays SC-OR quarterly for the cost of treating the District's wastewater. The District is responsible for passing the cost of

treatment onto its customers as a separate line item on the customer's bill. Costs associated with treatment are not included in this rate study.

IV. Existing Rate Structure

Rate of service charges are set based on generally accepted guidelines and principles. The guiding principles by which rates are set are that they shall be cost-based, easy to understand and administer, and shall be equitable and stable in their ability to provide adequate revenues to meet the utility's financial, operating, maintenance and regulatory requirements.

Maintaining "affordable" rates should almost never take precedence over charging rates that are necessary to recover the full costs of service. Artificially maintaining low rates will lead to deferring maintenance, rehabilitation and replacement, deteriorating infrastructure and creating public health hazards and higher costs in the future.

The District also needs to maintain adequate financial reserves which are necessary to address unpredictable expenditures such as damage from natural disasters, sudden increases in energy costs, etc. Also, as a system ages, there is more likelihood of major breakdowns and unplanned expenditures. Reserve funds are categorized as 1) general operating reserves for unexpected loss, 2) emergency funds for capital construction as a result of unplanned breakdown or natural disaster, 3) rate stabilization to avoid or mitigate abrupt rate increases resulting from sudden operating expenses (i.e. energy cost increases), 4) debt reserve fund required to show bond holders that payment will be made during a financial problem (i.e. high delinquency rate among customers).

Expenses

The District's principal source of revenue to recover operating and maintenance (O&M) expenses and capital expenses are sewer service charges paid by the District's customers. O&M expenses include salaries, wages, and benefits, services and supplies, utilities, professional services, fuel, vehicle maintenance, construction and repair materials, and other miscellaneous expenses. Capital expenses include infrastructure replacement and upgrade projects and equipment and vehicle replacements.

Current Service Charges

The District's monthly service charge is based on a system which converts customers to equivalent dwelling units (EDU). Residential customers are considered one EDU and non-residential customers can range from one to many depending on how their wastewater generation compares to a single family residence. A commercial establishment may have a multiple EDU count and thus the service charge would be multiplied accordingly. The following shows the existing monthly rate charges per month for each EDU:

Monthly charge per EDU:

Primary System	
Service Charge	$ 16.55
RDA Debt Service	$ 4.90
Pumping Charge	$ 4.35
KRE (Kelly Ridge Estates) Pumping Charge	$ 1.87
SC-OR Service Charge	$ 13.85
STEP System	
Service Charge	$ 21.40
RDA Debt Service	$ 4.90
SC-OR Service Charge	$ 13.85

1. Sewer Service Charge
   In the existing rate structure the base fee (sewer service charge) is identical for every user class (residential, commercial & industrial) based on the number of EDU. The single family residential (SFR), multi-family residential (MFR), and Commercial/Industrial users have the same monthly base fee of $16.55 per EDU. As an example, where a single family residence would pay a base charge of $16.55 per month, a commercial customer who has been assigned 5 EDU's would be charged $16.55 x 5, or $82.75 for the basic monthly service. The base charge was last increased on July 1, 2016.

2. RDA Debt Service
   In 2004 and 2005, the District issued a total of $5,000,000 worth of sewer revenue bonds through USDA Rural Development Agency (RDA). The debt service agreements included a requirement for a dedicated source of funds to cover annual principal and interest payments which was calculated at $4.90 per month per EDU. In fiscal year 2016/2017, one of the bonds was paid in full and retired. The outstanding bond's annual principal and interest payments will mature in 2043.

3. Pumping Charge
   For customers that have wastewater flows going through one or more of the District's lift stations, these customers pay a monthly Pumping Charge in addition to the base charge which goes to pay for operation and maintenance and upgrade costs for these lift stations. This monthly charge is presently set at $4.35 per EDU.

4. KRE Pumping Charge

For customers that are within Kelly Ridge Estates, their wastewater is handled by five lift stations. Kelly Ridge Estates customers currently pay an assessment for pumping expenses through the Butte County tax rolls, however it is less than the current Pumping Charge. The District has set a monthly charge for these customers for operation, maintenance and upgrade costs of $1.87 per EDU in addition to the assessment.

5. STEP System Sewer Service Charge
The District operates a STEP (septic tank effluent pump) system in the Villa Verona Assessment District area. This system utilizes individual pumps and septic tanks located on the customer's property to pump wastewater from the customer to a District pipeline. These systems are used where local topography does not lend itself to either a conventional gravity collection system or a regional sewer lift station. These systems are considered high maintenance due to the need for servicing each of the pumps and periodic pumping of the septic tanks. Therefore, to offset these higher operation and maintenance costs for the STEP system units, a separate rate charge for customers on a STEP system has been set at $21.40 per month.

6. SC-OR Service Charge
SC-OR charges LOAPUD customers for wastewater treatment and disposal costs through the District's billing system. The SC-OR service charge is set by SC-OR and included as a separate line item on the District's invoices. Money collected by the District for the SC-OR charge is passed through to SC-OR. SC-OR recently approved a service charge increase in order to fund major improvements at the wastewater treatment plant. The current SC-OR service charge is $13.85 per EDU per month.

V. Financial Guidelines and Assumptions

In addition to the guidelines discussed in Section IV, additional financial guidelines and assumptions were applied to generate equitable customer wastewater rates for the District. The District's budget documents are used as the starting point, however, projections of revenue requirements and requirements from rates are based on a set of assumptions related to customer growth, inflation, projected Capital Improvement Plans (CIPs), future expenditures and other factors during the 5-year study period. Based on the"cash basis" approach to setting rates, the District can determine the aggregate level of rate adjustment needed in order for the District to meet its overall expenditure needs.

The following assumptions and information were utilized in this study:

- The assumed customer growth rate is one percent (1%) throughout the study period based on assumptions in the District Master Plan.
- An inflation factor of three percent (3%) was used to project future expenses.
- The final budget for fiscal year ending (FYE) June 30, 2018 was used as the base year.
- Capital improvement project costs will increase at an annual rate of 3.0 percent, consistent with the 10-year historical average change in the Engineering News Record (ENR) construction cost index for the Sacramento area.
- The District now holds one sewer revenue bond of $3,150,000 which accrues interest at a rate of 4.25%. The bond will mature in 2043. The RDA Debt Service is paid via a set rate to the customers at $4.90 per month per EDU. The debt service requirements annual payments for principal and interest for the next 5 years are as follows:

Year Ended, June 30	Total Annual Service Payment (P&I)
2018	$164,370
2019	$165,160
2020	$164,823
2021	$165,400
2022	$164,850

To determine how much revenue needs to be acquired via rates, operation and maintenance costs as well as capital improvement program costs for the existing system need to be determined and projected over the next 5 years. The following two sections look at these costs.

VI. Operation and Maintenance Costs

Operation and maintenance costs are those expenses that occur while providing wastewater service to the District's customers for operating and maintaining the system including personnel, materials, services, and administration. These expenses are projected to increase due to inflation rate, cost-of-living increases, increased energy costs, and increased maintenance costs.

The facilities necessary to serve the wastewater needs of the District's customers are expensive and have a prescribed service life. Pipes, valves, manholes and wet wells can last 40 to 50 years, while electric controls and pumps may last only 5 to 20 years. In order to obtain the maximum useful life, it is necessary to properly maintain the facilities.

The District maintains approximately 65.9 miles of collector pipelines, 11 miles of main interceptor pipelines, 4.5 miles of force main, 9 lift stations, approximately 1,753 manholes and the Villa Verona STEP System.

The District also owns and must maintain various pieces of equipment and service vehicles such as service trucks, backhoes, excavators, portable pumps, rodding machines, trenchers, video inspection equipment, etc.

Historic O&M expenses from District audits from Fiscal Year (FY) 2013/14 to FY 2017/18 were used to predict trends for projecting future O&M expenses. Various expense categories including salaries and wages, benefits, administration, overhead, parts, construction materials, utilities, training, and others were evaluated over the previous five years to determine the annual percentage increase or decrease. This was used to project changes in expenses for the various categories over the next five years. The average of the five year projections was used as the basis for determining expenses for this rate study. Table VI-1 shows the average percent increase for the various categories of expenses.

Table VI-1
Average Percent Increases in O&M Expenses

	Average Increase
Salaries	7%
Benefits	4%
Admin	7%
Expenses	3%

Table VI-2 shows the most current FY 2018/19 O&M expenses and projected O&M expenses based on the average increases from Table VI-1.

Table VI-2
Projected Operation and Maintenance Expenses
FY 2018/19 to FY 2023/24

FY	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Salaries	$579,500	$620,065	$663,469	$709,912	$759,606	$812,778
Benefits	$349,669	$363,656	$378,202	$393,330	$409,063	$425,426
Admin	$188,154	$201,325	$215,417	$230,497	$246,631	$263,896
Expenses	$149,165	$153,640	$158,249	$162,997	$167,886	$172,923
Total	**$1,266,488**	**$1,338,686**	**$1,415,337**	**$1,496,736**	**$1,583,186**	**$1,675,023**

Average Total O&M Expense Projection = $1,462,576 per Year

The District currently has a total of 6,152 EDU. Based on historical growth patterns, a growth rate of 1% per year is anticipated. Table VI-3 shows the projected number of EDU from the present to FY 2023/24.

Table VI-3
Projected Equivalent Dwelling Units
FY 2018/19 to FY 2023/34

FY	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
EDU	6,152	6,213	6,276	6,338	6,402	6,466

Average EDU = 6,308

VII. Capital Improvement Program Costs

The District's annual budgets include capital improvement projects and purchases for the coming fiscal year. District management and staff prioritize and budget capital improvements based on need and available funds.

Capital improvements are necessary to upgrade, repair and maintain the aging collection system and pumping facilities, improve energy efficiencies, address safety and code inadequacies, and meet regulatory requirements. The District has identified various necessary capital improvement projects for the next 20-year period including projected equipment repairs, purchases, and replacements. A system was developed which lists each of the capital improvements, identifies the number of years until implementation, the estimated cost in today's dollars, the projected cost at the year of implementation at a 3% interest rate, and the amount of money to be collected each year to be able to fund the capital improvement at its year of implementation. This evaluation was done for District-wide projects and for lift station projects and is included as Appendix A, Table VII-1, Summary Listing of Proposed Capital Improvements/Equipment Upgrades.

The total cost of Capital Improvements in 2019 dollars is $2,571,294
The projected cost of Capital Improvements at year of implementation is $4,067,943
The cost per year to meet Capital Improvement Program is $497,820 per year
The monthly cost per EDU to implement the Capital Improvement Program is **$6.74/EDU/month**.

VIII. Emergency Reserves

The District does not presently have a dedicated source of funds for an Emergency Reserve account. Historically, in an emergency situation (natural disaster, unanticipated breakdown of equipment, etc.) the District would need to borrow funds from other accounts with no method of repaying that account. The District should consider establishing an emergency fund paid through service charges which would allow the District to pay for emergencies without having to

take money from other necessary funds or borrow money. It is recommended that the District establish a minimum $50,000 per year emergency reserve account.

IX. Pipeline Replacement Program

In addition to the repairs and replacements of capital items mentioned above, the District's existing sewer pipe system will need to be replaced. Sewer pipe has a limited service life expectancy which varies with type of pipe material. Other factors also influence the service life of sewer pipe including but not limited to; soil conditions, root intrusions, chemical characteristics of the wastewater stream, and installation practices. Furthermore, it is quite often the fittings and gasket materials that leak long before the main section of pipe has even started to deteriorate. Based on some known conditions of the District's existing pipes and on research of industry analysis, for this study we will use the following service life expectancies for the three types of pipe within the District.

Pipe Material	Service Life (yrs.)
Asbestos Cement	60
Vitrified Clay	75
PVC/Ductile Iron	100

In order to pay for replacement of the District's pipes over time as they begin to wear out, funds need to be collected in advance over the years leading up to the projected time of replacement. The entire District piping system was analyzed for type, size and age of pipe installed. From this information, a spreadsheet was created that listed the total amount of pipe within the District for each type of pipe material base on pipe diameter and age of pipe. This information is shown in Appendix B, Table IX-1, Pipeline Inventory Compilation and Costs.

Appendix B, Table IX-1 shows how much pipe of each size and type was installed within a given five-year time frame. This table further shows when that pipe will need to be replaced and how much it will cost to replace, in 2019 dollars. To completely replace the district piping over the assumed life-span of all the pipes, it is projected that approximately $2,509,310 needs to be collected each year.

Appendix B, Table IX-2, Pipeline Replacement Sum of Total Costs, summarizes the total replacement costs from Table VII-1 for each type of pipe material for each five -year period over the next 95 years. This shows that a total of $49,737,382 needs to be collected in those 95 years to pay for the replacement of the District's aging pipeline system.

X. Revenues

In addition to the rates and service charges that are the subject of this report, the District has a number of other revenue sources, including taxes, interest income, connection fees, and other miscellaneous fees such as inspection and plan check fees. Historic non-rate revenues from District audits from Fiscal Year (FY) 2013/14 to FY 2017/18 were used to predict trends for projecting future revenues. Various revenue categories were evaluated over the previous five years to determine the annual percentage increase or decrease. This was used to project changes in revenues for the various categories over the next five years. The average of the five year projections was used as the basis for determining non-rate revenues for this rate study. Table X-1 shows the average percent increase for the various categories of expenses.

Table X-1
Average Percent Increases in Non-Rate Revenues
FY 2018/19 to FY 2023/34

	Average Increase
Taxes	3%
Interest	5%
Late Fee	3%
Misc	6%

Table IX-2 shows the most current FY 2018/19 non-rate revenues and projected non-rate revenues based on the average increases from Table X-1 above.

Table X-2
Projected Non-Rate Revenues
FY 2018/19 to FY 2023/34

FY	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Taxes	$296,816	$305,720	$314,892	$324,339	$334,069	$344,091
Interest	$20,739	$21,776	$22,865	$25,008	$25,208	$26,469
Late Fee	$42,086	$43,349	$44,649	$45,998	$47,368	$48,789
Misc	$17,347	$18,387	$19,941	$20,660	$21,900	$23,214
Total	**$376,988**	**$389,232**	**$402,347**	**$416,005**	**$428,545**	**$442,563**

Average Non-Rate Revenue Projection = $409,280 per Year

XI. Rate Design

To the extent that projected revenues from current non-rate revenue sources are less than projected costs, a rate structure must be designed to assure that the District sewer system is viable and properly funded. The projected difference between annual sewer system O&M costs and total non-rate revenue is shown below. This is the amount that must be covered by the base service charge.

Difference Between Annual Non-Rate Revenue and Annual O&M Expenses

Total Annual Revenue from Existing Non-Rate Sources	$ 409,280
Total Annual Sewer System Costs	$1,462,576
Annual Difference to be Covered by Service Charge	**<$1,053,296>**

Since the District's sewer rates are not metered and are not based on meter sizes, consumption or production levels, the rates simply take into account the proposed budget expenses and divide that among all of the existing users as a flat rate. The sewer service charge required to cover the basic O&M expenses is calculated as follows:

Monthly O&M Service Charge = $\frac{\$1,053,296/year}{6,308\ EDU}$ = $166.98/EDU/year = **$13.91/EDU/month**

In addition to the O&M expenses, capital improvements must also be covered by the monthly service charge. As discussed in Section VII above, the projected monthly **Capital Improvement Program** cost is **$6.74/EDU/month**.

Should the District opt for an emergency reserve fund of $50,000 per year to be covered by the monthly service charge, the cost would be calculated as follows:

Emergency Reserve = $\frac{\$50,000/year}{6,308\ EDU}$ = $7.93/EDU/year = **$0.66/EDU/month**

The total monthly service charge excluding the Emergency Reserve is calculated as follows:

Monthly O&M Service Charge	= $13.91/EDU/month
Capital Improvement Program	= $ 6.74/EDU/month
Total Monthly Service Charge	**= $20.65/EDU/month**

The current monthly service charge is $16.55/EDU/month. The proposed new service charge excluding the emergency reserve would represent an increase of $4.10/EDU/month, or 25%.

The total monthly service charge including the Emergency Reserve is calculated as follows:

Monthly O&M Service Charge	= $13.91/EDU/month
Capital Improvement Program	= $ 6.74/EDU/month
Emergency Reserve	= $ 0.66/EDU/month
Total Monthly Service Charge	**= $21.31/EDU/month**

The proposed new service charge including the emergency reserve would represent an increase of $4.76/EDU/month, or 29%.

Rate Options

Any raise in the monthly service charge will most likely be met with unfavorable response. It may not be politically viable for the District to implement a large increase in the monthly service charge at one time. The minimum rate that should be charged for the current 2019/2020 budget year to cover all the O&M expenses as well as the needed and budgeted capital expenses would be $20.65/EDU/month. However, this would represent a 25% increase compared to the current monthly service charge. In order to reduce the initial rate increase to District customers, the District may want to consider a smaller initial increase followed by modest annual step increases. Table XI-1 shows the projected revenue for each of the next five years, along with the total revenue generated in that time, by implementing the one-time 25% rate increase of $4.10/EDU/month.

Table XI-1
Projected Revenue with One-Time 25% Rate Increase, No Reserve
FY 2019/20 to FY 2023/34

FY	2019/20	2020/21	2021/22	2022/23	2023/24	**Total**
EDU	6,213	6,276	6,338	6,402	6,466	
25% Increase	$20.65	$20.65	$20.65	$20.65	$20.65	
Revenue/Mo	$128,298	$129,599	$130,880	$132,201	$133,523	
Revenue/Yr	$1,539,576	$1,555,188	$1,570,560	$1,586,412	$1,602,276	**$7,854,012**

In order to reduce the initial rate increase to District customers, the District may want to consider a smaller initial increase followed by modest annual step increases.
Projecting the rate over a five year period, if the initial increase was reduced by $2.00/EDU/month and an annual step increase of $1.00/EDU/month was adopted over the following four years, approximately the same amount of revenue will be generated. Table XI-2 shows the projected revenue for each of the next five years, along with the total revenue generated in that time, by implementing a first year 13% increase of $2.10/EDU/month followed by a 5% increase for $1.00/EDU/month for the following four years.

Table XI-2
Projected Revenue with Initial 13% Increase ($2.10) and
5% Stepped Rate Increase ($1.00), No Reserve
FY 2019/20 to FY 2023/34

FY	2019/20	2020/21	2021/22	2022/23	2023/24	**Total**
EDU	6,213	6,276	6,338	6,402	6,466	
Step Increase	$18.65	$19.65	$20.65	$21.65	$22.65	
Revenue/Mo	$115,872	$123,323	$130,880	$138,603	$146,455	
Revenue/Yr	$1,390,464	$1,479,876	$1,570,560	$1,663,236	$1,757,460	**$7,861,596**

There is another concern with the step increase as shown in Table XI-2 above. SC-OR recently approved a rate increase that will be included on the LOAPUD sewer bill. The new SC-OR service charge includes an annual $2.00/EDU/month step increase through FY 2022/23 and a $4.00/EDU/month step increase in FY 2023/24. The District may want to consider avoiding a step increase on top of the larger SC-OR increase in FY 2023/24. An additional option would be to implement a step increase over the next four years that would achieve the same revenue goals as the previous options. Table XI-3 shows the projected revenue for each of the next five years, along with the total revenue generated in that time, by implementing a 9% increase of $1.50/EDU/month for each of the first four years with no increase the fifth year.

Table XI-3
Projected Revenue with 9% ($1.50) Stepped Rate Increase
for the First Four Years, No Reserve
FY 2019/20 to FY 2023/34

FY	2019/20	2020/21	2021/22	2022/23	2023/24	**Total**
EDU	6,213	6,276	6,338	6,402	6,466	
Step Increase	$18.05	$19.55	$21.05	$22.55	$22.55	
Revenue/Mo	$112,145	$122,695	$133,415	$144,365	$145,808	
Revenue/Yr	$1,345,736	$1,472,350	$1,600,979	$1,732,381	$1,749,700	**$7,901,146**

Under the step increase example shown in Table XI-2 above, the initial increase from $16.55/EDU/month to $18.65/EDU/month would represent first year increase of 13% with each of the annual $1.00/EDU/month increases representing a 5% increase. Similarly, a step increase rate structure that includes the Emergency Reserve, would have an initial increase from $16.55/EDU/month to $19.31/EDU/month, representing a first year increase of 17% with each of the annual $1.00/EDU/month increases representing a 5% increase. For the step increase example shown in Table XI-3 above, implementation of the Emergency Reserve would initially increase the service charge from $16.55/EDU/month to $18.72/EDU/month representing a 13% increase.

As mentioned previously, an additional $28.00 per month per EDU would need to be collected to start reserving funds to pay for future pipeline replacement over the next 100 years. This amount would most likely be unfavorable to the rate payers. The District will need to evaluate the minimum amount of pipeline replacement that it feels is necessary and the minimum amount of funds it needs to start collecting.

Service Charge Options

Option 1 – One Time Increase with No Emergency Reserve:
$20.65/EDU/month
Increase of $4.10/EDU/month, 25%

Option 2 - One Time Increase with Emergency Reserve:
$21.31/EDU/month
Increase of $4.76/EDU/month, 29%

Option 3 - Five Year Step Increase with No Emergency Reserve:
$18.65/EDU/month for first year, annual $1.00/EDU/month increase
Increase of $2.10/EDU/month first year, 13%
Increase of $1.00/EDU/month for four years, 5%

Option 4 - Five Year Step Increase with Emergency Reserve:
$19.31/EDU/month for first year, annual $1.00/EDU/month increase
Increase of $2.76/EDU/month first year, 17%
Increase of $1.00/EDU/month for four years, 5%

Option 5 - Four Year Step Increase with No Emergency Reserve:
$18.05/EDU/month for first year, annual $1.50/EDU/month increase
Increase of $1.50/EDU/month for four years, 9%

Option 6 - Step Increase with Emergency Reserve:
$18.71/EDU/month for first year, annual $1.50/EDU/month increase
Increase of $2.16/EDU/month first year, 13%
Increase of $1.50/EDU/month for three years, 9%

XII. Comparison Costs

For comparison purposes, wastewater service rates were obtained from various districts and cities in Northern California of similar service size as LOAPUD. In comparing LOAPUD rates to other service providers, we also tried to find providers that had similar rate structures as LOAPUD. Monthly wastewater service rates of comparable service providers along with LOAPUD are shown in Table XII-1. The information is presented for informational purposes only and does

not necessarily reflect the relative cost-effectiveness of each service provider. The comparison table does give the District a barometer of its rates in relation to surrounding communities and similar service providers.

Table XII-1
Sewer Service Rate Comparisons
Per Single Family EDU

Sewer Service Provider	**Basic Monthly Sewer Charge**
Lake Oroville Area Public Utility District (Range depending on selected option)	$18.05 *base* + $4.90 *RDA* + $13.85 *SC-OR* = $36.80 $21.31 *base* + $4.90 *RDA* + $13.85 *SC-OR* = $40.06
City of Chico	$23.31
City of Corning	$33.64
City of Marysville	$36.80
City of Oroville	$23.56 *base* + $13.85 *SC-OR* = $37.41
City of Gridley	$37.96
Thermalito Water & Sewer District	$28.27 + $13.85 *SC-OR* = $42.12
City of Willows	$40.19
City of Yuba City	$44.58
City of Grass Valley	$55.00
City of Woodland	$57.00
City of Biggs	$65.90
Hamilton City CSD	$67.75
City of Auburn	$72.56
City of Williams	$76.50
City of Colusa	$78.85

XIII. Lift Station Pumping Charge

In addition to the base monthly service charge, District customers whose service requires pumping through one or more of the District's lift stations are also charged a Pumping Charge. The District keeps track of lift station O&M expenses separately to insure that only those customers being pumped are responsible for those costs.

Lift Station O&M Expenses

O&M expenses for the District's lift stations are tracked separately to be attributed to the customers whose sewage requires pumping. These customers are billed a Pumping Charge in addition to the base Service Charge.

Projected lift station O&M expenses were based on the historic expenses and the average percent increases from Table VI-1 above. Table XIII-1 shows the projected lift station O&M expenses.

Table XIII-1
Projected Lift Station Operation and Maintenance Expenses
FY 2018/19 to FY 2023/24

FY	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Salaries	$28,503	$30,498	$32,633	$34,917	$37,361	$39,976
Utilities	$60,924	$62,752	$64,634	$66,573	$68,570	$70,627
Expenses	$12,818	$13,202	$13,599	$14,007	$14,427	$14,860
Total	**$102,245**	**$106,452**	**$110,866**	**$115,497**	**$120,358**	**$125,463**

Average Total Lift Station O&M Expense Projection = $113,480 per Year

The District currently has a total of 2,368 EDU that require pumping. Based on historical growth patterns, a growth rate of 1% per year is anticipated. Table XIII-2 shows the projected number of EDU requiring pumping from the present to FY 2023/24.

Table XIII-2
Projected Equivalent Dwelling Units Requiring Pumping
FY 2018/19 to FY 2023/34

FY	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
EDU	2,368	2,392	2,416	2,440	2,464	2,489

Average EDU requiring pumping = 2,428

Lift Station Capital Improvements

The District has identified various necessary capital improvement projects for the lift stations including projected equipment repairs, purchases, and replacements. A system was developed which lists each of the capital improvements, identifies the number of years until implementation, the estimated cost in today's dollars, the projected cost at the year of implementation at a 3% interest rate, and the amount of money to be collected each year to be able to fund the capital improvement at its year of implementation. This evaluation was done for the lift station projects and is included as Appendix A.

The total cost of Lift Station Improvements in 2019 dollars is $345,000
The projected cost of Lift Station Improvements at year of implementation is $444,279
The cost per year to meet Lift Station Improvements is $56,216 per year
The monthly cost per EDU to implement the Capital Improvement Program is **$1.96/EDU/month**.

Lift Station Rate Design

The pumping charge required to cover the basic O&M expenses is calculated as follows:

Monthly O&M Pumping Charge = $113,480 /year = $46.74/EDU/year = **$3.89/EDU/month**
2,428 EDU

In addition to the O&M expenses, capital improvements must also be covered by the monthly service charge. As discussed in Section VII above, the projected monthly **Lift Station Capital Improvement Program** cost is **$1.96/EDU/month**.

The total monthly Pumping Charge is calculated as follows:

Monthly O&M Pumping Charge	= $3.89/EDU/month
Capital Improvement Program	= $ 1.96/EDU/month
Total Monthly Pumping Charge	**= $5.85/EDU/month**

The current monthly pumping charge is $4.35/EDU/month. The proposed new pumping charge would represent an increase of $1.50/EDU/month, or 34%.

KRE (Kelly Ridge Estates) Pumping Charge

Customers in Kelly Ridge Estates have historically been, and will continue to be, assessed an annual pumping charge through the Butte County tax rolls. The assessment amount is $29.86/EDU/year or $2.48/EDU/month. Therefore, in order to be equitable with other pumping customers, customers in Kelly Ridge Estates should be charged the difference between the total pumping charge and the assessment amount they are already paying.

The total monthly KRE Pumping Charge is calculated as follows:

Total Monthly Pumping Charge	= $5.85/EDU/month
KRE Pumping Assessment	= $ 2.48/EDU/month
Monthly KRE Pumping Charge	**= $3.37/EDU/month**

XIV. Recommendations

Increasing service rates is not an easy process or an exact science. Different rate options may affect how much revenue the District will gain and the District may find that one option works better than another. Therefore the District must evaluate the adequacy of the rates annually. It is recommended that the District increase the monthly sewer service charge as much as politically feasible to ensure adequate revenues are accrued to cover O&M costs, necessary

capital improvements and to start replacing an aging infrastructure. The following steps are recommended:

1. Choose an option as outlined in this report to increase the monthly sewer service charge at a minimum to cover all O&M costs along with an additional increase to cover capital improvements and future facility replacement.

2. Create a dedicated source of reserve funds included in the monthly service charge.

3. Include 5-year projections on the proposed budget to better review revenue needs for future projects or capital improvement items.

4. Increase the pumping charge in order to collect funds to be used for the eventual improvements and repairs that will be needed at all lift stations.

5. Begin collecting revenues to be dedicated to a long term pipeline replacement program.

APPENDIX A

TABLE VII-1, SUMMARY LISTING OF PROPOSED CAPITAL IMPROVEMENTS/EQUIPMENT UPGRADES

Table VII-1
Lake Oroville Area Public Utility District, Oroville, California
Cost of Services Rate Study - 2019
Summary Listing of Proposed Capital Improvements / Equipment Upgrades

Facility	Project Description: Repair/Replacement/Maintenance, etc	Year Initially Installed	Expected Replacement Date	Justification	Project Cost 2019 $	Cost at Time of Replacement @ 3% Inflation	# edu's per facility at present time	# edu's per facility at time of replacement	Years until start of project	Cost per edu per year	Cost per edu per month	Based on # of edu at 1% Growth Over Average Length of Project Start Dates (12.2 years) Cost per edu/year	Cost per edu/month
L1	Retrofit with submersible pumps	2007	2030	Less maint/better reliability	$ 75,000	$ 103,818	2368	2642	11	3.99	0.33	3.71	0.31
L1	Retrofit with piping between overflow strorage and wet well.	2007	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
L2	Retrofit with submersible pumps	2007	2030	Less maint/better reliability	$ 95,000	$ 131,502	2368	2642	11	5.05	0.42	4.70	0.39
L2	Retrofit with piping between overflow strorage and wet well.	2007	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
L3	Retrofit with piping between overflow strorage and wet well.		2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
HT LS	Replace section of force main not replaced in 2003 - 700' of 8"	1973 and 2003	2025	Deteriorating Line	$ 175,000	$ 208,959	2368	2514	6	14.71	1.23	13.70	1.14
HT LS	Retrofit with submersible pumps	1973 and 2003	2030	Less maint/better reliability	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
HT LS	Upgrade SCADA to show generator running	1973 and 2003	2025	Existing Deficiency	$ -	$ -	2368	2514	6	0.00	0.00	0.00	0.00
HT LS	Replace Microtel Auto Dialer - is aging and obsolete	1973	2020	Aging/obsolete	$ -	$ -	2368	2392	1	0.00	0.00	0.00	0.00
RO LS	Install overflow storage	1978 and 2008	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
RO LS	Retrofit with submersible pumps	1978 and 2008	2030	Less maint/better reliability	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
RO LS	Install bypass pumping ports	1978 and 2008	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Install bypass pumping ports	1982	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Replace deteriorated piping	1982	2030	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Retrofit and upgrade pumps -submersible	1982	2030	Less maint/better reliability	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her Ls	Upgrade SCADA	1982	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Upgrade obsolete electrical	1982	2030	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Upgrade backup generator	1982	2030	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Upgrade Microtel autodialer	1982	2030	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
Her LS	Install overflow storage	1982	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Install alarm and SCADA system	1962	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Install overflow storage	1962	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Install bypass pumping ports capability	1962	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Replace deteriorating piping	1962	2030	Deteriorating Line	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Retrofit with upgraded submersible pumps	1962	2030	Less maint/better reliability	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
LP LS	Upgrade obsolete electrical	1962	2020	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
VDC LS	Install overflow storage	1977	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
VDC LS	Upgrade outdated & obsolete electrical & controls	1977	2030	Aging/obsolete	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
VDC LS	Install standby generator	1977	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
VDC LS	Install SCADA	1977	2030	Existing Deficiency	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
VDC LS	Upgrade pumps	1977	2030	Less maint/better reliability	$ -	$ -	2368	2642	11	0.00	0.00	0.00	0.00
MT LS	Retrofit wet well to larger size due to short cycling	1999	2030	Existing Deficiency	$ -	$ -	2368	2861	19	0.00	0.00	0.00	0.00
MT LS	Replace pumps		2030	Aging/obsolete	$ -	$ -	2368	2861	19	0.00	0.00	0.00	0.00
						$ 444,279			***Total LS Costs:***	$ 23.74	$ 1.98	$ 22.11	$ 1.84
									Ave LS Costs	$ 0.72	$ 0.06	$ 0.67	$ 0.06
Villa Verona													
									VV Step Costs:				
Master Plan	Sewer System Master Plan Update		2019		$ 65,000	77,613	6152	6530	6	2.10	0.18	$ 1.98	$ 0.17
Manholes	Manhole repairs - various: see attachment, 20/year		2019		$ 10,000	10,300	6152	6214	1	1.67	0.14	$ 1.66	$ 0.14
Manholes	Manhole repairs - various: see attachment 20/year		2020		$ 10,000	10,609	6152	6276	2	0.86	0.07	$ 0.85	$ 0.07
Manholes	Manhole repairs - various: see attachment 10/year		2021		$ 5,000	5,464	6152	6338	3	0.30	0.02	$ 0.29	$ 0.02
Pipelines	Pipeline repairs - various: see attachment; severe needs, approx. 600'		2019		$ 10,000	10,300	6152	6214	1	1.67	0.14	$ 1.66	$ 0.14
Pipelines	Pipeline repairs - various: see attachment; Heavy needs, approx. 2400'		2020		$ 25,000	26,523	6152	6276	2	2.16	0.18	$ 2.11	$ 0.18
Pipelines	Pipeline repairs - various: see attachment; Average needs, approx. 750'		2021		$ 10,000	10,927	6152	6338	3	0.59	0.05	$ 0.57	$ 0.05
					$ -	0	1	1	1	0.00	0.00	$ -	$ -
Manholes	Manhole replacement - various		2020		$ -	0	6152	6214	1	0.00	0.00	$ -	$ -
Manholes	Manhole replacement - various		2021		$ -	0	6152	6276	2	0.00	0.00	$ -	$ -
					$ -	0	1	1	1	0.00	0.00	$ -	$ -
Pipelines	Pipeline replacement - Mission Slipline 540'x12"		2019	Aging/obsolete	$ 63,294	65,193	6152	6214	1	10.60	0.88	$ 10.49	$ 0.87
Pipelines	Pipeline replacement - Ophir School Pipe Burst		2019		$ 55,000	56,650	6152	6214	1	9.21	0.77	$ 9.12	$ 0.76
Pipelines	Pipeline replacement - North Burbank Bypass A8-A9-A10		2025		$ -	0	6152	6338	3	0.00	0.00	$ -	$ -
Pipelines	Pipeline replacement - Old State Line Xing Lincoln Blvd		2025		$ -	0	6152	6402	4	0.00	0.00	$ -	$ -
Pipelines	Pipeline replacement -		2025		$ -	0	6152	6466	5	0.00	0.00	$ -	$ -
Pipelines	Pipeline replacement - Z-284 to Z-285 in Kelly Ridge Visitor Center Line 3400' 8"		2023		$ 340,000	394,153	6152	6466	5	12.81	1.07	$ 12.19	$ 1.02
PIpelines	Pipeline replacement - Mt Ida S-151 to S-152 200' of 12"		2022		$ 25,000	28,138	6152	6402	4	1.14	0.10	$ 1.10	$ 0.09
Pipelines	Pipeline replacement - Mt Ida S-132 to S-133 200' of 12"		2022		$ 25,000	28,138	6152	6402	4	1.14	0.10	$ 1.10	$ 0.09
					$ -	0	1	1	1	0.00	0.00	$ -	$ -
Equipment	Camera Van		2020		$ 304,000	362,992	6152	6530	6	9.83	0.82	$ 9.26	$ 0.77
Equipment	Install particulate filter on 2000J.D. 410E		2025	Mandatory	$ 24,000	28,657	6152	6530	6	0.78	0.06	$ 0.73	$ 0.06
Equipment	Replace 1988 Case backhoe with new	1988			$ -	0	6152	6466	5	0.00	0.00	$ -	$ -
Equipment	Replace 1970 J.D. 644A loader with new	1970			$ -	0	6152	6596	7	0.00	0.00	$ -	$ -
Equipment	Replace 1998 X331 Bobcat excavator with new	1998	2030		$ 68,000	94,128	6152	6864	11	1.39	0.12	$ 1.25	$ 0.10
Equipment	Install particulate filter on Kabelco ED150		2025	Mandatory	$ 30,000	35,822	6152	6530	6	0.97	0.08	$ 0.91	$ 0.08
Equipment	2008 Ford Explorer	2008	2025	Aging/obsolete	$ 35,000	41,792	6152	6530	6	1.13	0.09	$ 1.07	$ 0.09
Equipment		2001		Aging/obsolete	$ -	0	6152	7142	15	0.00	0.00	$ -	$ -
Equipment	1999 Ford F-450 flatbed dump	1999	2025	Aging/obsolete	$ -	0	6152	7072	14	0.00	0.00	$ -	$ -
Equipment	1996 Ford F-350 7.5L	1996			$ -	0	1	1	1	0.00	0.00	$ -	$ -
Equipment	1996 Ford F-150 fuel truck	1996	2023	Aging/obsolete	$ 30,000	33,765	6152	6402	4	1.37	0.11	$ 1.32	$ 0.11
Equipment	Sterling Jet-Rodder	2004	2030	Aging/obsolete	$ 150,000	179,108	6152	6530	6	4.85	0.40	$ 4.57	$ 0.38
Equipment			2020	Aging/obsolete	$ -	0	6152	6728	9	0.00	0.00	$ -	$ -
Equipment	Peterbilt Dump	2007	2030	Aging/obsolete	$ 80,000	110,739	6152	6864	11	1.64	0.14	$ 1.47	$ 0.12
Equipment	Portable compressor		2022	Aging/obsolete	$ 5,000	5,464	6152	6338	3	0.30	0.02	$ 0.29	$ 0.02
Equipment	Portable Godwin pump		2025	Aging/obsolete	$ 10,000	11,941	6152	6530	6	0.32	0.03	$ 0.30	$ 0.03
Equipment	Back-up Jet Rodder	1983	2030	Aging/obsolete	$ -	0	6152	6864	11	0.00	0.00	$ -	$ -
Equipment	John Deere 410 backhoe		2025	Aging/obsolete	$ 75,000	89,554	6152	6530	6	2.43	0.20	$ 2.29	$ 0.19
Equipment	Easement machine		2030	Aging/obsolete	$ 25,000	43,838	6152	7432	19	0.38	0.03	$ 0.31	$ 0.03
Equipment	Portable Onan DYA 60 generator		2021	Aging/obsolete	$ 12,000	16,127	6152	6796	10	0.26	0.02	$ 0.24	$ 0.02
Equipment	Rodding Machine		2030	Aging/obsolete	$ 45,000	62,291	6152	6864	11	0.92	0.08	$ 0.83	$ 0.07
Equipment	Case 360 trencher		2025	Aging/obsolete	$ 25,000	37,815	6152	7072	14	0.44	0.04	$ 0.38	$ 0.03
Equipment	Kabelco ED150 excavator		2035	Aging/obsolete	$ 150,000	233,695	6152	7142	15	2.53	0.21	$ 2.18	$ 0.18
Equipment	Ford 2008 F-350 dually	2008	2023	Aging/obsolete	$ -	0	6152	6932	12	0.00	0.00	$ -	$ -
Equipment	Gormann Rupp portable pump		2030	Aging/obsolete	$ 15,000	20,764	6152	6864	11	0.31	0.03	$ 0.28	$ 0.02
					$ -	0	1	1	1	0.00	0.00	$ -	$ -
Buildings	Buildings/Office		2045	Aging/obsolete	$ 500,000	1,046,889	6152	7890	25	6.81	0.57	$ 5.31	$ 0.44
					$ 2,571,294	***$ 4,067,943***				$ 80.92	$ 6.74	$ 76.09	$ 6.34

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APPENDIX B

TABLE IX-1, PIPELINE INVENTORY COMPILATION AND COSTS

TABLE IX-2, PIPELINE REPLACEMENT SUM OF TOTAL COSTS

Table IX-1
Lake Oroville Area Public Utility District
Pipeline Inventory Compilation and Costs

CLAY PIPE, 75 year life expectancy

Year Installed:		'56-'60: age = 55 years Years 'til Replacement: 20		'61-'65: age = 50 Years 'til Replacement: 25		'66-'70: age = 45 Years 'til Replacement: 30		'71-'75: age = 40 Years 'til Replacement: 35		'76-'80: age = 35 Years 'til Replacement: 40		'81-'85: age = 30 Years 'til Replacement: 45		'86-'90: age = 25 Years 'til Replacement: 50		'91-'95: age = 20 Years 'til Replacement: 55		'96-'00: age = 15 Years 'til Replacement: 60		'01-'05: age = 10 Years 'til Replacement: 65		'06-'10: age = 5 Years 'til Replacement: 70		
Pipe Size	Replace $/ft In 2019 $	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	
6”	$150	0	$0.00	0	$0.00	1042	$5,210.00	9924	$42,531.43	0	$0.00	0	$0.00	7397	$22,191.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
8”	$175	355	$3,106.25	0	$0.00	0	$0.00	2089	$10,445.00	0	$0.00	1990	$7,738.89	5021	$17,573.50	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
10”	$190	286	$2,717.00	0	$0.00	2615	$16,561.67	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
12”	$200	0	$0.00	0	$0.00	6124	$40,826.67	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
15”	$225	0	$0.00	380	$3,420.00	0	$0.00	0	$0.00	600	$3,375.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
18”	$250	1270	$15,875.00	0	$0.00	13570	$113,083.33	0	$0.00	6891	$43,068.75	0	$0.00	804	$4,020.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
24”	$300	0	$0.00	0	$0.00	2745	$27,450.00	705	$6,042.86	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
30”	$325	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
TOTAL:		1911	$21,698.25	380	$3,420.00	26096	$203,131.67	12718	$59,019.29	7491	$46,443.75	1990	$7,738.89	13222	$43,784.50	0	$0.00	0	$0.00	0	$0.00	0	$0.00	63808

A/C PIPE, 60 year life expectancy

Year Installed:		'56-'60: age = 55 years Years 'til Replacement: 5		'61-'65: age = 50 Years 'til Replacement: 10		'66-'70: age = 45 Years 'til Replacement: 15		'71-'75: age = 40 Years 'til Replacement: 20		'76-'80: age = 35 Years 'til Replacement: 25		'81-'85: age = 30 Years 'til Replacement: 30		'86-'90: age = 25 Years 'til Replacement: 35		'91-'95: age = 20 Years 'til Replacement: 40		'96-'00: age = 15 Years 'til Replacement: 45		'01-'05: age = 10 Years 'til Replacement: 50		'06-'10: age = 5 Years 'til Replacement: 55		
Pipe Size	Replace $/ft In 2019 $	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	
6”	$150	4702	$141,060.00	4227	$63,405.00	2022	$20,220.00	69816	$523,620.00	3703	$22,218.00	9183	$45,915.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
8”	$175	20790	$727,650.00	285	$4,987.50	264	$3,080.00	1780	$15,575.00	1525	$10,675.00	1930	$11,258.33	5058	$25,290.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
10”	$190	0	$0.00	1170	$22,230.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
12”	$200	0	$0.00	1240	$24,800.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
15”	$225	1199	$53,955.00	0	$0.00	2120	$31,800.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
18”	$250	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1620	$16,200.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
24”	$300	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
30”	$325	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
TOTAL:		26691	$922,665.00	6922	$115,422.50	4406	$55,100.00	71596	$539,195.00	6848	$49,093.00	11113	$57,173.33	5058	$25,290.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	132634

PVC PIPE, 100 year life expectancy

Year Installed:		'56-'60: age = 55 years Years 'til Replacement: 45		'61-'65: age = 50 Years 'til Replacement: 50		'66-'70: age = 45 Years 'til Replacement: 55		'71-'75: age = 40 Years 'til Replacement: 60		'76-'80: age = 35 Years 'til Replacement: 65		'81-'85: age = 30 Years 'til Replacement: 70		'86-'90: age = 25 Years 'til Replacement: 75		'91-'95: age = 20 Years 'til Replacement: 80		'96-'00: age = 15 Years 'til Replacement: 85		'01-'05: age = 10 Years 'til Replacement: 90		'06-'10: age = 5 Years 'til Replacement: 95		
Pipe Size	Replace $/ft In 2019 $	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	Length, ft	$/year	
6”	$150	0	$0.00	6517	$19,551.00	0	$0.00	54736	$136,840.00	16185	$37,350.00	16721	$35,830.71	3285	$6,570.00	2767	$5,188.13	3885	$6,855.88	2696	$4,493.33	0	$0.00	
8”	$175	0	$0.00	0	$0.00	0	$0.00	1577	$4,599.58	2302	$6,197.69	3227	$8,067.50	568	$1,325.33	3280	$7,175.00	0	$0.00	0	$0.00	0	$0.00	
10”	$190	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	293	$795.29	0	$0.00	3182	$7,557.25	0	$0.00	268	$565.78	0	$0.00	
12”	$200	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	2050	$5,857.14	0	$0.00	2729	$6,822.50	1617	$3,804.71	5691	$12,646.67	3270	$6,884.21	
15”	$225	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	
18”	$250	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	3146	$9,252.94	0	$0.00	525	$1,381.58	
25”	$250	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	218	$641.18	0	$0.00	0	$0.00	
27”	$300	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	2070	$6,536.84	
30”	$325	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	0	$0.00	5070	$17,344.74	
TOTAL:		0	$0.00	6517	$19,551.00	0	$0.00	56313	$141,439.58	18487	$43,547.69	22291	$50,550.64	3853	$7,895.33	11958	$26,742.88	8866	$20,554.71	8655	$17,705.78	10935	$32,147.37	147875

Total length of pipe: 344317

Total amount to be collected per year: **$2,509,310.15**

Total amount per year per edu: **$397.80**

Total amount per month per edu: **$33.15**

Table IX-2
LOAPUD Rate Study 2019
Pipeline Replacement Sum of Total Costs

Years 'til Replacement	Replacement Year	Existing Pipe Material			Total	Replacement Running Total
		A/C Pipe	Clay Pipe	PVC Pipe		
5	2020	$ 3,438,290.00			$ 3,438,290.00	$ 3,438,290.00
10	2025	$ 944,800.00			$ 944,800.00	$ 4,383,090.00
15	2030	$ 730,950.00			$ 730,950.00	$ 5,114,040.00
20	2035	$ 8,949,500.00	$ 395,565.00		$ 9,345,065.00	$ 14,459,105.00
25	2040	$ 1,050,400.00	$ 79,800.00		$ 1,130,200.00	$ 15,589,305.00
30	2045	$ 1,389,125.10	$ 5,633,850.00		$ 7,022,975.10	$ 22,612,280.10
35	2050	$ 632,250.15	$ 1,691,974.90		$ 2,324,225.05	$ 24,936,505.15
40	2055		$ 1,814,295.20		$ 1,814,295.20	$ 26,750,800.35
45	2060		$ 248,750.10		$ 248,750.10	$ 26,999,550.45
50	2065		$ 1,749,230.00	$ 814,625.00	$ 2,563,855.00	$ 29,563,405.45
55	2070				$ 0.00	$ 29,563,405.45
60	2075			$ 7,039,125.00	$ 7,039,125.00	$ 36,602,530.45
65	2080			$ 2,310,874.80	$ 2,310,874.80	$ 38,913,405.25
70	2085			$ 2,893,270.10	$ 2,893,270.10	$ 41,806,675.35
75	2090			$ 481,625.25	$ 481,625.25	$ 42,288,300.60
80	2095			$ 1,678,930.40	$ 1,678,930.40	$ 43,967,231.00
85	2100			$ 1,598,230.35	$ 1,598,230.35	$ 45,565,461.35
90	2105			$ 1,370,445.30	$ 1,370,445.30	$ 46,935,906.65
95	2110			$ 2,801,474.95	$ 2,801,474.95	$ 49,737,381.60
	Total:	*$ 17,135,315.25*	*$ 11,613,465.20*	*$ 20,988,601.15*	*$ 49,737,381.60*	