Report on Revenue Requirements, Costs of Service, and Rates for Water and Wastewater Service



City of Lawrence, Kansas Department of Utilities





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Black & Veatch Corporation

August 2, 2004

Mr. Mike Wildgen City Manager City of Lawrence 6 East 6th Street Lawrence, Kansas 66044-0708

Dear Mr. Wildgen:

We are pleased to present our *Report on Revenue Requirements, Costs of Service, and Rates for Water and Wastewater Service* for the City of Lawrence.

The report presents analyses of the revenue requirements of the water and wastewater utilities for the five year study period of 2005 through 2009, the results of detailed costs of service, the development of proposed water and wastewater rates to be effective January 1, 2005, the development of revised system development charges for each utility, and the development of proposed charges for waste haulers. Indicated water and wastewater rates for 2006 through 2009 are also developed in the report for the City's future planning and consideration. An Executive Summary precedes the detailed text of the report.

We wish to acknowledge the cooperation and assistance of City staff in providing guidance and information for the study. Ms. Anna White of our organization has been responsible for the detailed preparation of the studies summarized in this report.

It is a pleasure to be of service to the City of Lawrence in this matter.

Very truly yours,

BLACK & VEATCH CORPORATION

Keith D. Barber Senior Consultant

Enclosure

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Report on Revenue Requirements, Costs of Service, and Rates for Water and Wastewater Service

Executive Summary

A financing plan has been developed for the water and wastewater utilities which will provide sufficient revenues to meet annual revenue requirements for the five-year study period of 2005 through 2009. Revenue increases of 4 percent per year for the water utility and 9 percent per year for the wastewater utility are required during the study period. In addition, a total of \$135,800,000 of revenue bonds are proposed to be issued during the study period to help fund the proposed major capital improvement programs.

The total costs of service, or revenue requirements, for fiscal year 2005, the year that the first proposed rate increases are expected to be effective, have been allocated to the various customer classes according to the services rendered. The allocated combined utility cost of service by customer class is summarized in Table A along with the projected revenues under existing rates to identify the revenue adjustments required for each customer class.

Proposed schedules of charges have been designed to recover costs from customer classes in reasonable accord with the allocated cost of service shown in Table A. The proposed water charges are summarized in Table B and the proposed wastewater charges are summarized in Table C. Input and policy guidance concerning the development of these rates as well as the proposed system development charges was obtained from the City Commission during three separate workshops. As a result of our evaluations and analyses, the following summary of findings and recommendations are offered for consideration by the City.

Revenue Under Existing Rates

1. The City of Lawrence currently provides treated water and wastewater services to over 29,600 customers inside the City and about 100 retail customers outside the City. Wholesale treated water service is provided to the City of Baldwin, and Rural Water Districts 1, 2, 4, 5, and 6 of Douglas County. Wholesale treated water service is also provided to Rural Water District No. 13 on a standby basis. The number of inside City customers is projected to increase to about 32,600 by 2009 and the number of outside City customers is projected to remain at its current level.

- 2. Sales of treated water to inside City customers are projected to increase from about 3,588,500 thousand gallons (Mg) in 2004 to about 3,910,900 Mg by 2009. Total treated water sales to outside City customers, including wholesale customers, are projected to increase from about 696,600 Mg in 2004 to about 751,800 Mg in 2009. The majority of all outside City water sales are attributable to the wholesale water service customers. Contributed wastewater volume from inside City customers is projected to increase from about 2,550,000 Mg in 2004 to about 2,780,900 Mg by 2009. Contributed wastewater volume from outside City customers is projected to remain at about 3,500 Mg throughout the five-year study period.
- 3. The City's current water rates became effective on January 1, 2004. These rates include a minimum bill, which varies by meter size, and a three-step declining volume charge. The existing schedule of rates for wastewater service has also been in effect since January 1, 2004. These rates include a minimum bill, which varies by meter size, and a uniform volume charge. The minimum bills for both water and wastewater service includes a volume allowance of 2 Mg per month. Separate minimum bill and volume charges apply to inside and outside City customers for each utility. Excess wastewater strength charges are also applicable for customers whose wastewater strength for BOD and suspended solids exceeds 300 milligrams per liter (mg/l).
- 4. Revenue is principally derived from charges for treated water and wastewater services, with some revenue also derived from other miscellaneous sources. Revenue from treated water sales, under present rates, is projected to increase from \$10,532,200 in 2004 to about \$11,529,800 in 2009. Other water utility revenue, derived from turn-on charges, late payment penalties, payments from other entities for billing and collection services, and miscellaneous other sources is projected to remain at \$348,000 during the five-year study period. Revenue for wastewater collection and treatment services is projected to increase from \$11,654,000 in 2004 to about \$12,798,800 in 2009, under present rates. Other wastewater utility revenue is projected to be about \$443,000 throughout the five-year study period. System development charge revenue under existing rates is expected to remain stable at \$400,000 for the water utility and \$400,000 for the wastewater utility.

Revenue Requirements

5. Costs of service to be recovered from water and wastewater service charges include operation and maintenance expense, existing and proposed future revenue bond debt service costs, existing debt service on State Revolving Fund loans, cash financing of

capital improvements not financed from bond or loan proceeds or contributions, and funding of an operating reserve equal to 90 days of operating expenses.

- 6. Operation and maintenance expense includes the costs of labor, materials, power, chemicals, and other expenses associated with the utility's operation. Operation and maintenance expense for the water utility is projected to increase from \$7,180,000 to \$9,136,400 during the period 2004 through 2009, principally as a result of the combined effects of inflation and system growth. Operation and maintenance expense for the water utility is projected to increase from \$6,107,900 to \$7,789,900 during the five-year study period due to inflation and system growth.
- 7. Capital improvements include ongoing improvements to the Clinton and Kaw water treatment plants, improvements at the Kansas River wastewater treatment plant, design and construction of a new 6.9 mgd wastewater treatment plant, installation of new water mains, sewer lines, pump stations, and other system enhancements. The need for these improvements is largely influenced by system growth, regulatory requirements, and system reliability considerations. Expenditures for the improvements during the projected study period of 2004 through 2009 are estimated to total \$45,951,000 for the water utility and \$105,678,000 for the wastewater utility.
- 8. It is estimated that approximately 82 percent of the funding requirement for the major capital improvement program will be provided by the issuance of revenue bonds. The revenue bonds are assumed to be repaid over a 20-year term at an average interest rate of 5.5 percent. The remaining funding is expected to be derived from annual water and wastewater charge revenue, interest income, and the use of available fund balances.
- 9. Annual principal and interest funding requirements on proposed revenue bonds for the two utilities are projected to increase to about \$9,271,800 by the end of the five-year study period. The utilities current debt obligations for 2004 include \$1,035,400 of existing wastewater revenue bonds and \$4,143,900 of existing state revolving fund loans.
- 10. Analyses of projected revenues and revenue requirements for the water and wastewater utilities were conducted to determine the adequacy of existing rates. The table below summarizes the annual revenue increases required over the next five years to meet future revenue requirements, continue to maintain and improve the infrastructure of both utilities, and maintain combined utility revenue bond debt service coverage at a minimum level of 140 percent. The higher wastewater revenue increases are primarily due to the need to construct the new wastewater treatment plant and generally maintain the reliability of the wastewater system.

Year	Water	Wastewater	Combined
2005	4.0%	9.0%	6.6%
2006	4.0%	9.0%	6.7%
2007	4.0%	9.0%	6.7%
2008	4.0%	9.0%	6.8%
2009	4.0%	9.0%	6.9%

Indicated Revenue Increases

Cost of Service Allocations

The annual cost of service for the water system to be met from water rates during the 11. projected 2005 test year is as follows:

Total Revenue Requirements for water Othity.		
Operation and Maintenance Expense	\$7,692,000	
Debt Service Requirements	1,488,800	
Routine Capital Additions	384,900	
Operating Reserve	162,100	
Cash Financed Capital Improvements	<u>3,700,000</u>	
Total		\$13,427,800
Revenue Requirements Met from Other Sources:		
Other Revenue	\$348,000	
System Development Charge Revenue	400,000	
Interest Income	290,200	
Use of Available Reserves	1,229,700	
Total		<u>\$2,267,900</u>
Net Cost of Service to be Recovered		
by Treated Water Rates		\$11,159,900

Total Revenue Requirements for Water Utility.

12. The annual cost of service for the wastewater system to be met from wastewater rates during the projected 2005 test year is as follows:

Total Revenue Requirements for Wastewater Utility:

Operation and Maintenance Expense	\$6,464,800	
Debt Service Requirements	4,846,500	
Routine Capital Additions	390,300	
Operating Reserve	0	
Cash Financed Capital Improvements	2,600,000	
Total		\$14,301,600
Revenue Requirements Met from Other Sources:		

R ources: 4

Other Revenue	\$443,000	
System Development Charge Revenue	400,000	
Interest Income	410,800	
Use of Available Reserves	95,300	
Total		<u>1,349,100</u>
Net Cost of Service to be Recovered		
by Treated Wastewater Charges		\$12,952,500

- 13. As a basis for the design of schedules of water and wastewater rates, costs of service are allocated to classes of customers in accordance with respective service requirements. The allocated water utility costs are adjusted to recognize recovery of public and private fire protection costs as well as water used by the City for municipal operations from inside City customers. A comparison of adjusted cost of service with revenue under existing rates is shown in Table A. This table indicates that the overall system revenue increase is expected to be 6.6 percent as previously stated but the required revenue increase from inside City residential customers is 5.4 percent.
- 14. Cost of service based unit costs for BOD and suspended solids are equal to the proposed surcharge rates to be applied to excess strength wastewater customers. Currently, the BOD unit cost is applied to BOD levels in excess of 300 mg/l and similarly, the suspended solids unit cost is applied to suspended solids concentrations in excess of 300 mg/l.

Water and Wastewater Rate Adjustments

15. Schedules of proposed rates for water and wastewater service have been designed on the basis of cost of service and local policy considerations as further described in the report. Summaries of these rates are shown in Tables B and C of this summary and Tables 16 and 32 of the report. The proposed water and wastewater rates represent a change from the existing form of rates to reduce the cost to low volume users and promote water conservation. The prior minimum charges for both utilities have been replaced by service charges, thereby eliminating the charge for 2,000 gallons of water or wastewater previously included in the minimum charges. Therefore, the new service charges continue to recover the costs of meter reading, billing, collection, and other customer related costs but do not include any costs related to a minimum usage requirement. The proposed 2005 water rates consist of service charges varying with meter size and uniform volume charges by class. The residential volume charge is proposed to become an inverted two-step block beginning in 2007. The first or

"normal" residential block will be initially set at 20,000 gallons, the same usage block established by the existing declining block rate structure. The usage allowance for this first block will decrease to 15,000 gallons in 2008 and to 10,000 gallons in 2009 and subsequent years. All residential customers using more water than the first block allowance will be charged at a higher rate as shown by Table B. This proposed plan results in a three-year phase-in period of the new residential rate structure to give affected residential customers ample time to adjust to the new inverted block rate structure. The proposed wastewater rates consist of a flat service charge and a single volume charge for all customers plus a set of surcharge rates for high-strength customers.

- 16. Projected revenues under proposed rates are compared with adjusted costs of service in Tables 17 and 33 of the report.
- 17. Typical bills for combined water and wastewater service under rates proposed to become effective January 1, 2005, are shown in Table D. Identical information for each utility is shown in Table 37 of the report.

Rural Water District Charges

18. Water charges to rural water district or wholesale customers will continue to consist of a uniform volume charge for all water usage. It is expected that all new or renegotiated wholesale water contracts will guarantee a minimum purchase amount to partially reduce the risk of serving these customers. The rates for existing wholesale customers are projected as shown below:

	Indicated
Year	Rate
	\$/Mg
2005	2.25
2006	2.41
2007	2.47
2008	2.63
2009	2.72

The projected wholesale water rates do not include any costs related to the maintenance or investment in small water mains serving only retail customers, costs for municipal water usage, public fire protection related costs, or any costs related to the purchase of raw water from the Clinton Reservoir. Table 14a of the report shows

the detailed development of the proposed uniform volume charge applicable to wholesale water customers in calendar year 2005.

Waste Hauler Charges

- 19. The current charge for waste hauler related treatment services is \$119.51 per Mg of chemical waste and \$137.41 per Mg of septage discharged. The current rates do not fully recover all costs required to provide this service.
- 20. The City of Lawrence has the capability to provide regional wastewater treatment services to a portion of County residents that discharge wastewater to privately owned septic tanks and commercial operations that require treatment services for chemical toilet wastes. To provide this service, the City has constructed a secured waste hauler receiving station at its treatment facility. Wastewater charges for this service can range from the minimum recovery of only the operation, maintenance, and replacement (OM&R) costs that are required by federal user charge requirements to full cost recovery of all costs required to serve these customers. The table below indicates a reasonable range of charges that could apply to the waste haulers.

	Minimum Charge		Total Charge	
	Chemical <u>Wastes</u>	Septic <u>Tank Wastes</u>	Chemical <u>Wastes</u>	Septic Tank Wastes
Service Charge - \$/Mg				
Receiving Facility	11.33	11.33	59.33	59.33
Sampling Services	<u>29.33</u>	<u>24.00</u>	29.33	24.00
Total	40.66	35.33	88.66	83.33
Treatment Charge - \$/M	g			
OM&R	83.05	99.87	83.05	99.87
Capital	0.00	0.00	99.49	116.57
Total	83.05	99.87	182.54	216.44
Combined Total - \$/Mg	123.71	135.20	271.20	299.77
Proposed Total Charge -	\$/Mg (a)		171.71	183.20

Range of Potential Waste Hauler Charges

(a) Excludes treatment related capital charges.

The indicated minimum charges in the table above assumes that the City will only recover the applicable share of annual depreciation associated with the waste hauler receiving facility, sampling will be provided on the average of every fifth load discharged, and the City will not charge any capital costs, other than depreciation, related to the treatment plant or receiving facility. The indicated total charge assumes that the City will recover a proportionate share of all capital costs directly from the users of the receiving facility, sampling will also be provided on the average of every fifth load discharged, and both OM&R and capital related treatment costs will be fully recovered. Charges under each case do not include the collection and transportation of the wastes to the receiving facility by the waste hauler. The proposed waste hauler charges recover all costs required to serve the waste haulers except the return on investment related to the treatment facilities. These costs are excluded to offer more competitive rates.

System Development Charges

21. Proposed system development charges for both the water and wastewater utilities have been developed based on a combination of the system buy-in and incremental cost-pricing methodologies. These charges are designed to recover the investment in treatment plant, water mains, major sanitary sewer lines and other "backbone facilities" required to serve new customers. 2005 system development charges for a new residential customer to be served by a 5/8-inch water meter are \$1,250 for the water system and \$770 for the wastewater system or a total of \$2,020 for both utilities. Table E shows a summary comparison of existing and projected system development charges for each utility.

Table A Combined Utilities Comparison of Allocated Cost of Service with Revenue Under Existing Rates Test Year 2005

			Revenue	
		Adjusted	Under	Indicated
Line		Cost of	Existing	Revenue
No.		Service	Rates	Adjustment
		\$	\$	
	Inside City			
1	Residential	16,878,100	16,012,500	5.4%
2	Other Non-residential	5,588,200	5,051,300	10.6%
3	Total Inside City	22,466,300	21,063,800	6.7%
	Outside City			
4	Residential	21,400	23,300	-8.2%
5	Non-residential	463,600	440,400	5.3%
6	Subtotal Outside City	485,000	463,700	4.6%
7	Rural Water Districts	1,140,300	1,067,700	6.8%
8	Total Outside City	1,625,300	1,531,400	6.1%
9	Total Combined Utilities	24,091,600	22,595,200	6.6%

Table B Water Utility Existing and Proposed Water Rates

Water Rates 2005 2006 2007 2008 2009 Inside City Limits Monthly Volume Charge - \$1,000 gallons Minimum Next 480,000 gallons 1.52 Next 480,000 gallons 1.78 Next 480,000 gallons 1.78 2005 2.88 2.93 2.9 Next 480,000 gallons 1.78 2.67 2.78 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifirmily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.10 2.10 Metri Size - Inches 5.8 and 3/4 6.55 1.95 2.10 2.20 2.2 1.30<		Existing	Proposed Water Rates						
Inside City Limits Monthly Volume Charge - \$/1,000 gallons Minimum First 2,000 gallons 0.52 Next 48,000 gallons 1.92 Over 500,000 gallons 1.73 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.7 Residential 2.67 2.78 3.10 3.42 3.7 All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifamily 2.31 2.40 2.49 2.57 2.66 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.02 2.2 1 3.00 3.00 3.00 3.00 3.00 3.20 2.0 2.2 1.2.0 2.00 2.00 3.00 <		Water Rates	2005	2006	2007	2008	2009		
Instance Charge S1,000 gallons First 2000 gallons S1,000 gallons First 800,000 gallons 1.92 Over 500,000 gallons 1.92 Over 500,000 gallons 1.92 Over 500,000 gallons 1.78 Residential Tirst Block (a) 2.267 2.78 3.10 3.23 2.30 2.30 2.30 2.30 2.30 2.30 2.30 2.30 2.31 2.22 2.30 <th 2"2"2"2"2"2"2"2"2"2"2"2"2"2"2"2"2"2<="" colspan="2" td=""><td>Incida City Limita</td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td>Incida City Limita</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		Incida City Limita						
Moning Volume Charge - 5/1,000 gallons First 2,000 gallons 2.52 Next 18,000 gallons 2.52 Over 500,000 gallons 1.78 Residential 2 Tirst Block (a) 2.67 2.78 2.88 2.93 2.9 Number Charge - 5/810 2 All Other Usage 2.67 2.78 2.88 2.90 2.10 2.10 2.10 Multifiamity 2.31 2.40 2.40 2.30 2.31 Industrial 1.85 2.00 2.00 2.00 2.10 2.20 I 12 9.00 3.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00 <th< td=""><td></td><td>h/1 000 11</td><td></td><td></td><td></td><td></td><td></td></th<>		h/1 000 11							
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Next 180,000 gallons 1.292 Over 500,000 gallons 1.78 Residential First Block (a) 2.67 2.78 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifamily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.1 Monthy Charge - S/Bill Meter Size - Inches 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.2 1.1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 1.230 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.00 13.00 32.00 33.0 10 96.00 39.00 30.00 31.00 32.00 33.0 10 96.00 39.00 30.00 31.00 32.00 33.0 10 96.00 39.00 30.00 31.00 32.00 33.0 12 12.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthy Volume Charge - S/1,000 gallons First Block (a) 3.15 Next 480,000 gallons 2.65 Over 500,000 gallons 2.65 Over 500,000 gallons 2.12 Residential First Block (a) 3.26 3.46 3.54 3.62 3.7 All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.43 2.58 2.65 2.79 2.8 1.2 1.00 3.10 3.20 3.30 3.4 2 1.00 3.10 3.20 3.30 3.4 2 1.00 4.30 4.30 4.50 4.60 4.80 4.9 1.1/2 1.1.10 3.00 3.10 3.20 3.30 3.4 2 1.6.90 4.30 4.30 4.50 4.60 4.8 4 5.900 17.00 17.00 17.50 18.00 18.50 4 5.900 17.00 17.00 17.50 18.00 18.50 4 5.900 17.00 17.00 17.50 18.00 18.50 3 4.800 3.50 3.50 3.50 4.500 3.500 3.50 1.2 166.00 52.00 52.00 52.00 55.00 56.00 77.00 2.700	First 2,000 gallons	Minimum 2.52							
Next 480,000 galons 1.92 Over 500,000 galons 1.78 Residential - First Block (a) 2.67 2.78 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifamily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Idustrial 1.88 1.94 2.03 2.10 2.1 Mottr Strze - Inches - - - 2 2.30 3.0 3.00 3.20 2.00 2.00 2.20 2.2 1.30	Next 18,000 gallons	2.52							
Residential 267 2.78 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifamily 2.05 2.13 2.22 2.30 2.3 Commercial 2.05 2.13 2.22 2.30 2.1 Mothly Charge - \$/Bil Meter Size - Inches 2 2.10 2.1 Mothly Charge - \$/Bil 1.88 1.94 2.03 2.10 2.1 Mothly Charge - \$/Bil 2 2.13 2.20 2.2 2 1 8.90 2.35 2.50 2.60 2.7 1/1/2 9.70 2.80 2.90 3.00 3.20 3.30 1.30	Over 500 000 gallons	1.92							
Residential	Over 500,000 ganons	1.70							
First Block (a) 2.67 2.78 2.88 2.93 2.9 All Other Usage 2.67 2.78 3.10 3.42 3.73 Multifamily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.1 Mothly Charge - S/Bill 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.22 1 8.90 2.35 2.35 2.50 2.60 2.7 1/2 9.70 2.80 2.80 2.90 3.00 3.20 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.50 16.00 16.5 6 58.00 22.00 23.00 23.00 24.0 4.0 8 79.00 30.00 30.00 31.00 12.00 45.00 49.00 51.0 120.00 46.00 46.00 <	Residential								
All Other Usage 2.67 2.78 3.10 3.42 3.7 Multifamily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.1 Monthy Charge - S/Bil	First Block (a)		2.67	2.78	2.88	2.93	2.9		
Multifiamily 2.31 2.40 2.49 2.57 2.6 Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.1 Monthy Charge - S/Bill Meter Size - Inches 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.2 1 8.90 2.35 2.35 2.50 2.60 2.7 1 1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.50 13.00 13.0 4 39.0 15.00 15.50 16.00 16.5 6 58.00 22.00 22.00 23.00 23.00 24.0 8 79.00 30.00 30.00 31.00 32.00 33.0 10 96.00 39.00 39.00 41.00 42.00 43.0 12 120.00 46.00 46.00 48.00 49.00 51.0 Cutside City Limits Meter Size - Inches 2.12 Residential 2.13 2.55 2.61 2.79 2.8 Residential 2.12 Residential 2.11 2.25 2.41 2.47 2.63 2.7 Multifamily 2.50 2.99 3.15 3.31 3.4 Multifamily 2.50 2.90 3.15 3.31 3.4 Multifamily 2.50 2.90 3.15 3.31 3.4 Multifamily 3.55 2.60 2.70 2.80 2.9 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches S1/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 Meter Size - Inches 3.5 Multifamily 3.50 13.50 14.00 14.50 15.0 Meter Size - Inches 3.5 Multifamily 3.50 13.50 14.00 14.50 14.00 4.50 4.50 Meter Size - Inches 3.5 Multifamily 3.50 13.50 14.00 14.50 14.00 4.50 Meter Size - Inches 3.50 13.	All Other Usage		2.67	2.78	3.10	3.42	3.74		
Commercial 2.05 2.13 2.22 2.30 2.3 Industrial 1.88 1.94 2.03 2.10 2.1 Monthly Charge - S/Bill Meter Size - Inches 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.2 1 8.90 2.35 2.35 2.50 2.60 2.7 1.1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.50 13.00 13.0 4 39.00 15.00 15.00 15.50 16.00 16.5 6 58.00 22.00 22.00 23.00 23.00 24.0 8 79.00 30.00 30.00 31.00 32.00 33.0 10 96.00 39.00 39.00 41.00 42.00 43.0 12 12.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthly Volume Charge - S/1,000 gallons First 2,000 gallons 3.15 Next 480,000 gallons 2.65 Over 500,000 gallons 2.12 Residential First Block (a) 3.26 3.46 3.54 3.62 3.7 All Other Usage 3.26 3.46 4.08 4.71 5.3 Next 480,000 gallons 2.12 Residential Erist Block (a) 3.26 3.46 4.08 4.71 5.3 All Other Usage 3.26 3.46 4.08 4.71 5.3 All Other Usage 3.26 3.46 4.08 4.71 5.3 All Multifamily 2.25 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches 5/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 11/2 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 25.00 26.00 27.00 2.70 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 45.00 46.00 47.00 45	Multifamily		2.31	2.40	2.49	2.57	2.69		
Industrial 1.88 1.94 2.03 2.10 2.1 Monthly Charge - S/Bill Meter Size - Inches 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.2 1 8.90 2.35 2.35 2.50 2.60 2.7 1 1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.50 13.00 13.0 4 39.00 15.00 15.00 15.50 16.00 16.5 6 58.00 22.00 22.00 23.00 23.00 23.00 10 96.00 39.00 39.00 41.00 42.00 43.0 12 12.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthly Volume Charge - S/1,000 gallons First 2.000 gallons 2.12 Residential First 80.00 gallons 2.12 Residential First 80.00 gallons 2.12 Residential Commercial 2.12 Residential Commercial 2.12 Residential First 80.00 gallons 3.15 Nutifamily 2.50 2.99 3.15 3.31 3.4 Multifamily 2.50 2.90 3.15 3.31 3.4 Multifamily 2.50 2.90 3.15 3.31 3.4 Multifamily 2.50 2.90 3.15 3.31 3.4 Multifamily 3.20 3.30 3.4 Multifamily 3.20	Commercial		2.05	2.13	2.22	2.30	2.39		
Monthly Charge - S/Bill Meter Size - Inches 5/8 and 3/4 6.55 1.95 1.95 2.10 2.20 2.2 1 8.90 2.35 2.35 2.50 2.60 2.7 1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.00 12.55 13.00 13.00 4 39.00 15.00 15.50 16.00 16.5 6 58.00 22.00 22.00 23.00 23.00 23.00 32.00 33.0 10 96.00 39.00 30.00 31.00 32.00 33.0 12 120.00 46.00 48.00 49.00 51.0 Somothly Volume Charge - S/1,000 gallons 51.6 51.0 52.0 52.0 52.0 53.31 34. Northly Volume Charge - S/1,000 gallons 2.12 2.50 2.46 <	Industrial		1.88	1.94	2.03	2.10	2.1		
Meter Size - Inches $5/8$ and $3/4$ 6.55 1.95 2.10 2.20 2.2 1 8.90 2.35 2.35 2.50 2.60 2.7 1/2 9.70 2.80 2.80 2.90 3.00 3.2 2 12.30 3.90 3.90 4.10 4.20 4.4 3 31.00 12.00 12.50 13.00 15.00 15.50 16.00 16.5 6 58.00 22.00 23.00 23.00 23.00 24.00 33.00 10 96.00 39.00 39.00 41.00 42.00 43.0 12 120.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthy Volume Charge - S/1,000 gallons 3.15 Next 480,000 gallons 3.15 Next 480,000 gallons 3.15 Next 480,000 gallons 2.12 Nother 3.31 3.4 Connercial 2.43 2.56 2.79 2.8<	Monthly Charge - \$/Bill								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Meter Size - Inches								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5/8 and 3/4	6.55	1.95	1.95	2.10	2.20	2.25		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	8.90	2.35	2.35	2.50	2.60	2.70		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 1/2	9.70	2.80	2.80	2.90	3.00	3.20		
3 31.00 12.00 12.50 13.00 13.0 4 39.00 15.00 15.00 15.00 16.00 16.50 6 58.00 22.00 23.00 23.00 23.00 23.00 33.00 10 96.00 39.00 30.00 31.00 32.00 43.0 12 120.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthly Volume Charge - \$/1,000 gallons 5.15 First 2,000 gallons 3.15 Next 18.000 gallons 2.65 Over 500,000 gallons 2.12 Residential 7 First Block (a) 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 </td <td>2</td> <td>12.30</td> <td>3.90</td> <td>3.90</td> <td>4.10</td> <td>4.20</td> <td>4.40</td>	2	12.30	3.90	3.90	4.10	4.20	4.40		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3	31.00	12.00	12.00	12.50	13.00	13.00		
6 58.00 22.00 23.00 23.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 41.00 42.00 43.0 12 120.00 46.00 46.00 46.00 48.00 49.00 51.0 Outside City Limits Monthy Volume Charge - \$/1,000 gallons 51.0 First 2,000 gallons 2.65 0ver 500,000 gallons 2.12 Residential 7 7 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches 7 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 <td>4</td> <td>39.00</td> <td>15.00</td> <td>15.00</td> <td>15.50</td> <td>16.00</td> <td>16.50</td>	4	39.00	15.00	15.00	15.50	16.00	16.50		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	6	58.00	22.00	22.00	23.00	23.00	24.00		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	8	79.00	30.00	30.00	31.00	32.00	33.00		
12120.0046.0046.0048.0049.0051.0Outside City LimitsMonthly Volume Charge - \$/1,000 gallonsMinimumNext 18,000 gallons3.15First 2,000 gallons2.65Over 500,000 gallons2.12Residential $1000000000000000000000000000000000000$	10	96.00	39.00	39.00	41.00	42.00	43.00		
Outside City Limits Monthly Volume Charge - \$/1,000 gallons Minimum First 2,000 gallons 3.15 Next 18,000 gallons 2.65 Over 500,000 gallons 2.12 Residential First Block (a) 3.26 3.46 3.54 3.62 3.7 All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.44 1 0.10 2.55 2.60 2.70 2.80 2.9 $1.1/2$ 11.10 3.00 3.10 3.20 3.30	12	120.00	46.00	46.00	48.00	49.00	51.00		
Control Charge - S/1,000 gallonsFirst 2,000 gallonsMinimumNext 18,000 gallons3.15Next 480,000 gallons2.65Over 500,000 gallons2.12ResidentialFirst Block (a)First Block (a)3.263.263.464.084.715.3Multifamily2.502.993.153.313.4Commercial2.432.582.652.792.8Industrial2.232.362.432.562.662.702.80Quart Water Districts2.112.252.412.472.632.712.252.8110.102.552.602.702.802.91.1/21.1.103.003.103.203.303.4216.904.304.504.60459.0017.0017.5018.00459.0017.0017.5018.0010147.0044.0045.0046.0047.0048115.0034.0035.0055.0056.0057.0010147.0010147.0010147.0010147.001012	Outside City Limits								
Multing volume Charge - 3/1,000 gallons Minimum Next 18,000 gallons 3.15 Next 480,000 gallons 2.65 Over 500,000 gallons 2.12 Residential	Monthly Volume Charge	\$/1 000 gallons							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	First 2 000 gallons	Minimum							
Next 10,000 gallons2.13Next 480,000 gallons2.65Over 500,000 gallons2.12ResidentialFirst Block (a)First Block (a)3.263.263.464.10 Other Usage3.263.263.464.11 Other Usage2.12Multifamily2.502.993.153.313.4Commercial2.432.232.362.432.562.652.792.8Industrial2.252.412.472.632.7Meter Districts2.112.252.412.472.632.7Meter Size - Inches5/8 and 3/49.202.102.152.252.352.411.103.003.103.203.303.4216.904.304.304.504.60459.0017.0017.5018.0018.5689.0025.0025.0026.0027.008115.0034.0034.0036.0037.0010147.0044.0045.0045.0046.0042166.0052.0053.0055.0056.0057.0010147.0044.0045.0045.0046.0045.0	Next 18 000 gallons	3 15							
Next 430,000 gallons2.03 2.12ResidentialFirst Block (a) 3.26 All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.53 2.36 2.44 2.56 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.71 2.25 2.81 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2 16.90 4.30 4.30 4.30 4.50 4 59.00 11/2 11.10 3.00 3.10 3.20 3.30 3.44 59.00 1 1.60 4 59.00 7.00 27.00 2.00 25.00 2.00 25.00 2.00 25.00 2.00 25.00 3.00 36.0	Next 480,000 gallons	2.65							
2.12ResidentialFirst Block (a) 3.26 3.46 3.54 3.62 3.7 All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.44 1 10.10 2.55 2.60 2.70 2.80 2.9 $1.1/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.00 27.00 8 115.00 34.00 34.00 36.00 36.00 37.00 10 147.00 44.00 45.00 46.00 47.00 48.00 12 166.00 52.00 53.00 55.00 56.00 57.00	Over 500 000 gallons	2.03							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	over 500,000 ganons	2.12							
First Block (a) 3.26 3.46 3.54 3.62 3.7 All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 $11/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.00 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.00 12 166.00 52.00 53.00 55.00 56.00 57.0	Residential								
All Other Usage 3.26 3.46 4.08 4.71 5.3 Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.65 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 $11/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.00 8 115.00 34.00 34.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.00 12 166.00 52.00 53.00 55.00 56.00 57.00	First Block (a)		3.26	3.46	3.54	3.62	3.70		
Multifamily 2.50 2.99 3.15 3.31 3.4 Commercial 2.43 2.58 2.65 2.79 2.8 Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 $11/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.0 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.0 12 166.00 52.00 53.00 55.00 56.00 57.00	All Other Usage		3.26	3.46	4.08	4.71	5.33		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Multifamily		2.50	2.99	3.15	3.31	3.40		
Industrial 2.23 2.36 2.43 2.56 2.6 Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 $11/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.00 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.0 12 166.00 52.00 53.00 55.00 56.00 57.00	Commercial		2.43	2.58	2.65	2.79	2.89		
Rural Water Districts 2.11 2.25 2.41 2.47 2.63 2.7 Meter Size - Inches 5/8 and 3/4 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 1 1/2 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.0 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.0 12 166.00 52.00 53.00 55.00 56.00 57.0	Industrial		2.23	2.36	2.43	2.56	2.65		
Meter Size - Inches $5/8$ and $3/4$ 9.20 2.10 2.15 2.25 2.35 2.4 1 10.10 2.55 2.60 2.70 2.80 2.9 $11/2$ 11.10 3.00 3.10 3.20 3.30 3.4 2 16.90 4.30 4.30 4.50 4.60 4.8 3 48.00 13.50 13.50 14.00 14.50 15.0 4 59.00 17.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.0 8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.00 12 166.00 52.00 53.00 55.00 56.00 57.0	Rural Water Districts	2.11	2.25	2.41	2.47	2.63	2.72		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Meter Size - Inches								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5/8 and 3/4	9.20	2.10	2.15	2.25	2.35	2.40		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	10.10	2.55	2.60	2.70	2.80	2.90		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 1/2	11.10	3.00	3.10	3.20	3.30	3.40		
348.0013.5013.5014.0014.5015.0459.0017.0017.0017.5018.0018.5689.0025.0025.0026.0027.0027.08115.0034.0034.0036.0036.0037.010147.0044.0045.0046.0047.0048.012166.0052.0053.0055.0056.0057.0	2	16.90	4.30	4.30	4.50	4.60	4.80		
4 59.00 17.00 17.00 17.50 18.00 18.5 6 89.00 25.00 25.00 26.00 27.00 27.0 8 115.00 34.00 34.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.0 12 166.00 52.00 53.00 55.00 56.00 57.0	3	48.00	13.50	13.50	14.00	14.50	15.0		
689.0025.0025.0026.0027.0027.008115.0034.0034.0036.0036.0037.0010147.0044.0045.0046.0047.0048.0012166.0052.0053.0055.0056.0057.00	4	59.00	17.00	17.00	17.50	18.00	18.50		
8 115.00 34.00 34.00 36.00 36.00 37.0 10 147.00 44.00 45.00 46.00 47.00 48.0 12 166.00 52.00 53.00 55.00 56.00 57.0	6	89.00	25.00	25.00	26.00	27.00	27.00		
10147.0044.0045.0046.0047.0048.012166.0052.0053.0055.0056.0057.0	8	115.00	34.00	34.00	36.00	36.00	37.00		
12 166.00 52.00 53.00 55.00 56.00 57.0	10	147.00	44.00	45.00	46.00	47.00	48.00		
	12	166.00	52.00	53.00	55.00	56.00	57.00		

(a) First block is set at 20,000 gallons in 2007; 15,000 gallons in 2008; and 10,000 gallons in 2009 and subsequent years.

19-312(2) Multiple Living Units Customers served by a single meter shall be charged for water and sewer service according to the number of units served by the single meter, i.e., total usage will be divided by the number of living units served by the single meter to determine the charge per living unit, with the charge per living unit multiplied by the total number of living units served by the single meter to determine total charge. (Ord. 5701)

Table C Wastewater Utility Existing and Proposed Wastewater Service Charges

	Existing	Proposed Wastewater Service Charges					
	Rates	2005	2006	2007	2008	2009	
Inside City Limits							
Monthly Volume Charge - \$/1.	000 gallons						
First 2.000 gallons	Minimum	3.87	4.25	4.64	5.08	5.57	
Over 2,000 gallons	3.03	3.87	4.25	4.64	5.08	5.57	
Monthly Charge - \$/Bill							
Meter Size - Inches							
5/8 and 3/4	14.60	7.30	7.80	8.50	9.20	9.90	
1	14.80	7.30	7.80	8.50	9.20	9.90	
1 1/2	15.20	7.30	7.80	8.50	9.20	9.90	
2	15.80	7.30	7.80	8.50	9.20	9.90	
3	17.00	7.30	7.80	8.50	9.20	9.90	
4	21.00	7.30	7.80	8.50	9.20	9.90	
6	26.50	7.30	7.80	8.50	9.20	9.90	
8	32.00	7.30	7.80	8.50	9.20	9.90	
10	43.00	7.30	7.80	8.50	9.20	9.90	
12	51.00	7.30	7.80	8.50	9.20	9.90	
Excess Strength Surcharges - \$	5/pound						
BOD (in excess of 300 mg/l)	0.3700	0.3910	0.4242	0.4560	0.4877	0.5307	
TSS (in excess of 300 mg/l)	0.2010	0.2525	0.2766	0.2951	0.3176	0.3488	
Outside City Limits							
Monthly Volume Charge - \$/1,	000 gallons						
First 2,000 gallons	Minimum	4.41	4.66	5.07	5.53	6.05	
Over 2,000 gallons	4.10	4.41	4.66	5.07	5.53	6.05	
Monthly Charge - \$/Bill							
Meter Size - Inches							
5/8 and 3/4	16.50	9.10	9.60	10.50	11.40	12.30	
1	17.00	9.10	9.60	10.50	11.40	12.30	
1 1/2	18.50	9.10	9.60	10.50	11.40	12.30	
2	19.00	9.10	9.60	10.50	11.40	12.30	
3	20.50	9.10	9.60	10.50	11.40	12.30	
4	24.00	9.10	9.60	10.50	11.40	12.30	
6	30.00	9.10	9.60	10.50	11.40	12.30	
8	36.00	9.10	9.60	10.50	11.40	12.30	
10	47.00	9.10	9.60	10.50	11.40	12.30	
12	54.00	9.10	9.60	10.50	11.40	12.30	
Excess Strength Surcharges - \$	5/pound						
BOD (in excess of 300 mg/l)	0.4560	0.4560	0.4714	0.5047	0.5390	0.5900	
TSS (in excess of 300 mg/l)	0.2710	0.2990	0.3129	0.3326	0.3572	0.3945	

19-312(2) Multiple Living Units Customers served by a single meter shall be charged for water and sewer service according to the number of units served by the single meter, i.e., total usage will be divided by the number of living units served by the single meter to determine the charge per living unit, with the charge per living unit multiplied by the total number of living units served by the single meter to determine total charge. (Ord. 5701)

	Monthly	thly Existing Rates			Proposed Rates			Total	Percent
Meter Size	Usage	Water	Wastewater	Combined	Water	Wastewater	Combined	Increase	Increase
Inches	1,000 gal.	\$	\$	\$	\$	\$	\$	\$	<u> </u>
Residential									
5/8	0	6.55	14.60	21.15	1.95	7.30	9.25	(11.90)	-56.3%
5/8	1	6.55	14.60	21.15	4.62	11.17	15.79	(5.36)	-25.3%
5/8	2	6.55	14.60	21.15	7.29	15.04	22.33	1.18	5.6%
5/8	4	11.59	20.66	32.25	12.63	22.78	35.41	3.16	9.8%
5/8	6	16.63	26.72	43.35	17.97	30.52	48.49	5.14	11.9%
5/8	10	26.71	38.84	65.55	28.65	46.00	74.65	9.10	13.9%
5/8	15	39.31	53.99	93.30	42.00	65.35	107.35	14.05	15.1%
5/8	20	51.91	69.14	121.05	55.35	84.70	140.05	19.00	15.7%
Multifamily									
5/8	0	6.55	8.54	15.09	1.95	7.30	9.25	(5.84)	-38.7%
5/8	1	6.55	11.57	18.12	4.26	11.17	15.43	(2.69)	-14.8%
5/8	2	6.55	14.80	21.35	6.57	15.04	21.61	0.26	1.2%
5/8	4	11.59	20.86	32.45	11.19	22.78	33.97	1.52	4.7%
5/8	6	16.63	27.92	44.55	15.81	30.52	46.33	1.78	4.0%
5/8	10	26.71	40.04	66.75	25.05	46.00	71.05	4.30	6.4%
5/8	15	39.31	55.19	94.50	36.60	65.35	101.95	7.45	7.9%
5/8	20	51.91	71.54	123.45	48.15	84.70	132.85	9.40	7.6%
Commercial									
2	50	115.26	161.24	276.50	106.40	200.80	307.20	30.70	11.1%
2	100	211.26	312.74	524.00	208.90	394.30	603.20	79.20	15.1%
3	200	421.96	616.94	1,038.90	422.00	781.30	1,203.30	164.40	15.8%
3	300	613.96	919.94	1,533.90	627.00	1,168.30	1,795.30	261.40	17.0%
4	500	1,005.96	1,529.94	2,535.90	1,040.00	1,942.30	2,982.30	446.40	17.6%
4	1,000	1,895.96	3,044.94	4,940.90	2,065.00	3,877.30	5,942.30	1,001.40	20.3%
Industrial									
3	200	421.96	616.94	1,038.90	388.00	781.30	1,169.30	130.40	12.6%
3	300	613.96	919.94	1,533.90	576.00	1,168.30	1,744.30	210.40	13.7%
4	2,500	4,565.96	7,589.94	12,155.90	4,715.00	9,682.30	14,397.30	2,241.40	18.4%
6	5,000	9,034.96	15,170.44	24,205.40	9,422.00	19,357.30	28,779.30	4,573.90	18.9%

Table D Comparison of Typical Monthly Bills Under Existing and Proposed 2005 Rates

	Existing	2005	2006	2007	2008	2009
	\$	\$	\$	\$	\$	\$
			Water	Utility		
Residential				,		
5/8"	420	1,250	1,300	1,350	1,390	1,440
1"	1,140	3,130	3,250	3,370	3,480	3,600
1-1/2"	2,410	6,250	6,490	6,730	6,960	7,200
2"	5,250	10,000	10,380	10,760	11,140	11,520
All Other						
5/8"	560	1,250	1,300	1,350	1,390	1,440
1"	1,770	3,130	3,250	3,370	3,480	3,600
1-1/2"	4,400	6,250	6,490	6,730	6,960	7,200
2"	6,870	10,000	10,380	10,760	11,140	11,520
3"	(a)	18,750	19,460	20,180	20,890	21,600
4"	(a)	31,250	32,440	33,630	34,810	36,000
6"	(a)	62,500	64,880	67,250	69,630	72,000
8"	(a)	125,000	129,750	134,500	139,250	144,000
10"	(a)	187,500	194,630	201,750	208,880	216,000
12"	(a)	275,000	285,450	295,900	306,350	316,800
16"	(a)	687,500	713,630	739,750	765,880	792,000
			Wastewat	er Utility		
Residential				-		
All Meters	550	770	1.040	1.310	1.580	1.850
All Other			,	,	,	,
5/8"	870	1.400	1.900	2.390	2.890	3,380
1"	2,800	3,500	4,740	5,980	7,210	8,450
1-1/2"	6,860	7,000	9,480	11,950	14,430	16,900
2"	10,690	11,200	15,160	19,120	23,080	27,040
3"	(a)	21,000	28,430	35,850	43,280	50,700
4"	(a)	35,000	47,380	59,750	72,130	84,500
6"	(a)	70,000	94,750	119,500	144,250	169,000
8"	(a)	140,000	189,500	239,000	288,500	338,000
10"	(a)	210,000	284,250	358,500	432,750	507,000
12"	(a)	308,000	416,900	525,800	634,700	743,600
16"	(a)	770,000	1,042,250	1,314,500	1,586,750	1,859,000

Table ESystem Development Charges

(a) Determined based on analysis of new customer's anticipated use of the system.

Report on Revenue Requirements, Cost of Service, and Rates for Water and Wastewater Service

Introduction

The Lawrence Utilities Department provides water and wastewater service to residents of the City of Lawrence and portions of the outlying area. The Department operates through a Director of Utilities under the general supervision of the City Manager. The water and wastewater systems are operated as a combined utility for administrative and financial purposes. All revenues are commingled in common funds from which all water and wastewater operating expense, direct capital expenditures, and debt service costs are paid. However, water and wastewater rates are based upon separate schedules and are established to meet the separate revenue requirements of the two utilities.

Purpose

The purpose of this report is to project future revenue requirements of the water and wastewater utilities, determine the adequacy of rates to recover these revenue requirements, and develop rates that will recover the revenue requirements in an equitable manner from various customer classes. System development charges are also determined for each utility.

Scope

This report includes the result of studies of total revenue requirements, customer class costs of service, and proposed rates for retail and wholesale water service. Revenue requirements, which are projected through the 2009 calendar year, recognize the anticipated growth in number of customers and water used throughout the service area. The study of water utility revenue requirements takes into consideration operation and maintenance expense, the water utility share of principal and interest on existing debt, the estimated costs of the proposed program of capital improvements, continued funding of the operating reserve, requirements for future bond issues, and expenditures for routine capital improvements. Costs of providing water service are developed for each class of customer with rate modifications based on allocated costs and other factors. Studies of wastewater utility revenue requirements and costs of service are comparable in scope to the water utility studies. This report also includes a review and update of the system development charges for each utility.

General Description of Water and Wastewater Systems

The Lawrence water system provides treated water service to over 29,700 customers, most of whom are located within the corporate limits of the City. Treated water service is also currently provided, on a wholesale or sale for resale basis, to several rural water districts and Baldwin City. The service area is supplied from a 17.5 million gallon per day (mgd) capacity water treatment plant located near the Kansas River at Third and Indiana Streets, and a 15 mgd plant located near the Clinton Reservoir in the southwestern portion of the City. Storage reservoirs at the water treatment plants and on the distribution system provide about 7 million gallons of treated water storage to help maintain uniform service pressure throughout the system and meet peak system demands. Total installed pumping capacity at the two treatment plants is 52.7 mgd whereas the combined firm pumping capacity, with the largest pump at each treatment plant out of service, is about 42.7 mgd. The treated water transmission system includes water mains ranging in size from 8 to 24 inches in diameter. Local distribution for many areas is provided by mains 6 inches or less in diameter.

The wastewater utility provides retail service to virtually the same customers within the City which are served by the water utility. The Lawrence wastewater collection system includes approximately 357 miles of sanitary sewers ranging in size from 6 to 48 inches in diameter, and 42 wastewater pumping stations. Primary and secondary treatment of collected wastewater is provided at the 12.5 mgd capacity wastewater treatment plant located on the Kansas River near the eastern edge of the City.

General Assumptions

General assumptions used in the analyses of revenues and revenue requirements are summarized on the following page. Any substantial differences between the assumptions and actual occurrences may affect the indicated revenue increases and proposed charges presented in this report.

General Assumptions

Revenue

- Revenue projections are based on continuation of recent growth trends. No significant new growth is projected for wholesale water sales.
- Projected wastewater volumes are based on historic billed wastewater volume to water sales volume ratios by customer class.
- Other operating and non-operating revenue is conservatively projected based on average of past 5 years.

Operation and Maintenance Expense

- Salaries & Wages and Transfers to the General Fund will increase at a rate of 5 percent per year. All other expenditures will increase at a rate of 3 percent per year.
- Projected expenses associated with Power, Chemicals, and Raw Water includes adjustments for growth.
- Known increases in O&M costs due to new facilities are also included in the projections.

Major Capital Improvements

- Includes all improvements identified in the December 2003 Master Plan Reports.
- All cost estimates of projects include adjustments for price inflation.

Capital Improvement Financing

- Revenue Bonds will be issued in June of each year, as needed.
- Bonds are issued with 20 year terms and an average interest rate of 5.5 percent.
- Bond issuance costs are estimated to be 1.5 percent of issue amount.
- No new State Revolving Fund (SRF) loans are projected to be issued.
- Interest earned on short-term funds (operating and capital) is assumed to be 2 percent.
 Interest earned on long-term funds (reserves) is assumed to be 3 percent.
- About 71 percent of the proposed water system improvements and 87 percent of the proposed wastewater system improvements are expected to be debt financed.

Operating Cash Flow

- Proposed debt service assumes equal annual combined principal and interest payments.
- Minimum combined coverage is set to equal 140 percent of debt service.
- Interest income includes allowances for \$3 million of encumbrances.
- Operating reserve is maintained at a level equal to 90 days of O&M expense.

Cost of Service/Rate Design

- Costs for municipal water and fire protection will continue to be paid by inside City customers.
- The declining block water rate structure will be replaced by uniform volume charges by customer class. An inclining block rate will be phased-in for single family residential customers during the study period.

Water Utility Revenue and Revenue Requirements

Customers and Sales

Analysis of historical records indicates continued and stable growth in the water system. Table 1 contains a summary of historical and projected customer accounts and water sales. Treated water service is currently provided to over 29,600 customers inside the City and about 100 customers outside the City. Wholesale treated water service is provided to the City of Baldwin, and Rural Water Districts 1, 2, 4, 5, and 6 of Douglas County. Wholesale treated water service is also provided to Rural Water District No. 13 on a standby basis. The number of inside City customers is projected to increase to about 32,600 by 2009 and the number of outside City customers is projected to remain at its current level.

Sales of treated water to inside City customers are projected to increase from about 3,588,500 thousand gallons (Mg) in 2004 to about 3,910,900 Mg by 2009. Treated water sales to outside City customers are projected to increase from about 696,600 Mg in 2004 to about 751,800 Mg in 2009. The majority of all outside City water sales is attributable to wholesale water service customers.

Table 1 and other tables covering the water utility operations are shown at the end of this section beginning on Page 32.

Water Revenues

Revenues of the water utility consist of water sales revenue, other operating and nonoperating revenue, system development charge revenue, and interest income. Other operating revenue includes main extension advances, water tap fees, turn-on fees, and miscellaneous revenue. Interest income is derived from the investment of temporary fund balances. System development charge revenue recovers increased capacity costs imposed on the system by new customers. The development of this fee is discussed in more detail in the System Development Charge section of this report. Table 2 contains a summary of historical and projected water utility revenues.

Revenue Requirements

Revenue requirements of the water utility consist of operation and maintenance expense, debt service charges on existing and proposed debt, routine capital additions, and allowances for increased operating reserve.

Operation and Maintenance Expenses

Operation and maintenance expenses include the annual cost of labor, materials, power, chemicals, and other expenses associated with the treatment and distribution of water to customers of the system. Table 3 shows historical and projected future operation and maintenance expenses of the water utility. Operation and maintenance expense projections for the years 2004 through 2009 are based on an average of 93.5 percent of budgeted 2004 expenses adjusted to recognize allowances for the combined effects of inflation, anticipated system growth, and projected staffing and other additional operating requirements. The use of the 93.5 percent adjustment factor insures that budgeted contingency allowances will not be reflected in cost of service allocations and used to potentially overstate projected water rates. Additional operation and maintenance costs not included in the 2004 budget but included in projected expenses include an additional part time engineer and additional expenses associated with lime residuals at the Kaw Water Treatment Plant beginning in 2005, an additional maintenance person and additional costs associated with raw water supply at the Clinton Water Treatment Plant beginning in 2005, and an additional laboratory technician to be shared with the wastewater utility beginning in 2005. The expenses associated with lime residuals at the Clinton Water Treatment Plant will incur a one time expense in 2006 of \$300,000.

Existing utility records summarize historical operating expenditures for water and wastewater systems operation and maintenance and normal annual capital improvements together in a common tabulation. These records do not provide a separation of customer billing, collection, and accounting expense between the two utilities. For this study customer meter, billing, collection, and account expense has been allocated 45 percent to the water utility and 55 percent to the wastewater utility per staff direction.

Similarly, records of various administrative and general operating costs also are not separated between the two utilities. In Table 3 all such costs common to both the water and wastewater utilities are allocated to each utility in proportion to the historic average of all other expenses, less power, gas, raw water, and chemical costs.

Routine Capital Additions

Routine annual capital improvement expenditures include those costs which are usually incurred each year for normal replacements and other improvements and extensions. These costs are typically payable from operating funds. The table on the next page shows the projected water utility recurring annual capital requirements, including the estimated costs of meters, new service installations, and improvements not included in the major capital improvement program.

Year	Amount
	\$
2005	384,900
2006	400,200
2007	407,800
2008	420,200
2009	432,800

Projected Routine Capital Additions

Projections of future expenditures are based on an analysis of available historical experience and trends, and City budget projections, with allowances for future inflation. A portion of the projected costs of these recurring capital improvements is expected to be recovered from the proceeds of water service connection charges and water main extension fees included in the projections of other operating revenue shown in Table 2.

Since the cost of these improvements is a continuing expense to be met each year, it is considered reasonable utility practice that the portion not met from service connection and main extension fee proceeds should continue to be financed from current water sales revenue. Such a practice is reflected in evaluating the total revenue requirements in this report.

Major Capital Improvements

A summary of proposed water utility capital improvements for 2004 to 2009 is shown in Table 4. The estimated cost of these improvements, including allowances for inflation, is \$45,951,000.

The proposed water improvement projects shown in Table 4 were selected based on future needs and current regulatory requirements. Additional projects may also be required to meet currently pending or future regulatory requirements. The nature and magnitude of these potential projects is not known but should they be required, additional financing beyond that indicated in Table 4 may be necessary.

The cost of the scheduled capital improvements are expected to be financed from existing fund balances, annual system development charge revenues and other operating revenues available for cash financing of capital improvements, interest income earnings, and proceeds of future revenue bond issues, as shown in Table 5.

Debt Service Costs

Debt service costs attributed to the water utility's share of the existing SRF loans are shown in Table 6. The water utility does not share in the revenue bond related debt service for either of the two outstanding revenue bond issues which include the Water and Sewage System Revenue Bonds, Series 1996, and the Water and Sewage System Revenue Bonds, Series 1997.

Estimated debt service on the water utility's share of three proposed revenue bond issues is also shown in Table 6. These bonds are expected to be dated June 1 of the years 2005, 2007, and 2009. Estimated debt service payments on all future revenue bonds are based on serial maturities over 20 years with an annual interest rate of 5.5 percent and assuming equal annual total principal and interest payments on each issue. The total annual debt service deposits to the Principal and Interest Account is expected to increase from \$937,200 in 2004 to \$3,429,500 in 2009. The projected payments to the bondholders from funds accrued in the Principal and Interest Account are also shown in Table 6.

Summary of Revenue Requirements

Table 7 presents a pro forma statement of income and expenses for the water utility and includes projected revenues, operation and maintenance expense, debt service charges, routine annual improvements, allowances for maintaining the utility's share of the required operating reserve, and cash financing of major capital improvements. The revenue bond indenture requires an operating reserve balance equal to the next three months of expected operation and maintenance expenses.

The summary of projected water utility revenues and revenue requirements indicates that existing water user charges will not produce sufficient revenues to meet the financial needs of the water utility for the 2005 through 2009 study period.

Adjustments in revenues from water user charges are recommended beginning in 2005 to offset the effects of inflation and to finance the major capital improvement program. Annual adjustments of 4 percent per year for each year of the study period are indicated if projected conditions materialize. Higher or lower rates of inflation, additional regulatory requirements, growth, or changes in construction amounts may necessitate modifications in the recommended water rate adjustments.

Water Utility Cost of Service Allocations

In developing an equitable rate structure, revenue requirements are allocated to the various customer classifications according to the cost of the service rendered. Allocations of these requirements to customer classes should take into account the quantity of water used, relative peak capacity requirements placed on the system, the number and size of services to customers, proprietary interest in the system investment, and other relevant factors.

Cost of Service to be Allocated

The cost of service to be allocated to the various customer classes consists of the total revenue requirements less income received from other sources. For allocation purposes, this cost of service is expressed as an annual requirement for a specific test year. For purposes of this study, the calendar year ending December 31, 2005, has been selected as generally typical of conditions anticipated during the period in which the increased rates are expected to be in effect. This cost, totaling \$11,159,900 consists of \$7,349,400 of net operation and maintenance expense, and \$3,810,500 of net capital costs. These net costs are derived from Table 7 and summarized on Line 14 of Table 8.

Costs of service are apportioned among customer classes in this report on a utility basis, that is, in terms of operating expense, depreciation expense, and return. For a municipal utility, the total of depreciation expense and return is equal to the capital cost related portion of the total cost of service.

Depreciation is the loss, not restored by current maintenance, which occurs in the utility plant in service due to decay, inadequacy and obsolescence. Depreciation accounting is usually based on an annual percentage allowance of plant investment adequate to return the investment during the useful life of the facility. The annual allowance varies with the expected service lives of the various classes of property. The annual depreciation allowance normally is not accrued as a cash reserve, but is reinvested in replacements and additions to plant facilities. As the end of the useful life of the property item is reached, the equivalent in dollars will typically have been reinvested in replaced or added utility plant.

The depreciation expense associated with water service is estimated for this report recognizing depreciation rates presently in use by the water utility. This results in a projected test year depreciation expense of \$2,134,400 exclusive of depreciation on contributed plant, which is not recognized for cost allocation or rate design purposes.

Return is the balance of annual costs of service remaining after operating expense and depreciation are deducted, which amounts to \$1,676,100 in the test year. This return provides for payment of the interest portion of debt service and capital improvement costs

beyond that provided by the depreciation allowance.

The test year cost of service, expressed on a utility basis, is summarized on Lines 15 through 18 of Table 8.

Functional Cost Components

The various cost elements of water service are assigned to functional cost components as the first step in the subsequent distribution of the costs of service to customer classes. The principal functional cost components consist of base costs, extra capacity costs, and customer costs.

Base costs are those which vary directly with the quantity of water used, as well as those costs associated with serving customers under average load conditions without the elements necessary to meet water use variations or peak demands. Base costs include purchased power and treatment chemicals, and other operating and capital costs of the water system associated with serving customers to the extent required for a constant, or average annual rate of use.

Extra capacity costs represent those operating costs incurred due to demands in excess of average, and capital related costs for additional plant and system capacity beyond that required for the average rate of use. Total extra capacity costs are subdivided into costs associated with maximum day and maximum hour demands.

Customer costs are defined as costs which tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collection and accounting costs, and maintenance and capital charges associated with meters and services.

The separation of costs of service into these principal categories provides the means of further allocating such costs to the various customer classes based on the respective base, extra capacity, and customer service requirements of each customer class.

Water distribution mains are classified by the City to include only water lines less than 10-inches in diameter, that are primarily used to serve distribution system customers. Typically, they are not used to serve a large municipal customer such as Baldwin, since it and other rural water district customers own and maintain their own water distribution systems. Conversely, transmission mains are considered by the City to include 10-inch and larger water mains, and are used to serve all customer classes. Therefore, separate functional costs of service categories are designated for costs that are common to all customer classes and those which are common to distribution customers only.

Allocation to Cost Components

The water utility is comprised of a variety of service facilities, each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, the utility must be capable of not only providing the total amount of water used, but also supplying water at maximum rates of demand.

Since all customers do not exert their maximum demand for water at the same time, capacities of water facilities are designed to meet the peak coincidental demands that all classes of customers, as a whole, place on the system. For every water service facility on the system, there is an underlying average demand, or uniform rate of usage exerted by the customers for which the base cost component applies. For those facilities designed solely to meet average day demand, costs are allocated 100 percent to the base cost component. Extra capacity requirements associated with coincidental demands in excess of average use are further related to maximum daily and maximum hourly demands.

Analysis of historical system maximum day and maximum hour demands to average day demands results in appropriate ratios for the allocation of capital costs and operating expenses to base and extra capacity cost components. A maximum day to average day ratio of 2.2 is used based on experienced demands in the water system. This indicates that 45.5 percent of the capacity of facilities designed and operated to meet maximum day demand is required for average or base use. Accordingly, the remaining 54.5 percent is required for maximum day extra capacity requirements.

The costs associated with facilities required to meet maximum hour demand are allocable to base, maximum day extra capacity, and maximum hour extra capacity. A ratio of maximum hour to annual average day water use of 3.1 is used, based on demands experienced by the system. This ratio indicates that 32.3 percent of the capacity of facilities designed and operated for maximum hour demand is needed for average or base use, while 38.7 percent is utilized for maximum day extra capacity uses, and the remaining 29.0 percent is required to meet maximum hour extra capacity demand in excess of maximum day needs

Allocation of Plant Value

The estimated test year value of water system facilities is allocated to appropriate cost functions as the basis for further distribution to the various customer classes. The resulting distribution is the basis for the return element of the test year cost of service to respective classes.

The estimated test year plant investment in water facilities consists of plant in service as of December 31, 2003, the 2003 construction work in progress, and the estimated cost of proposed capital improvements expected to be in service by the end of calendar year 2005. Table 9 shows the allocation of the water utility's total estimated plant value less contributions or net plant investment for the test year on an original cost less depreciation value basis. Total plant investment is estimated to be \$49,764,500 as indicated by Line 13 of the table.

Allocated investment for this table is used as the basis for assigning the return portion of test year cost of service to respective customer classes.

Allocation of Depreciation Expense

Depreciation expense is projected to be \$2,134,400 for the test year. This amount was determined by applying the utility's annual depreciation rates to the estimated utility investment in the various facilities of the water system. Depreciation on contributed facilities is excluded. The allocation of test year depreciation expense to functional cost components is shown in Table 10. The items of expense are allocated to cost components on the same design or cost causative basis used to allocate plant investment.

Allocation of Operating Expense

Table 11 presents the allocation of operation and maintenance expense to functional cost components. Total test year operation and maintenance expense amounts to \$7,692,000 However, the addition of the annual requirement to maintain an adequate operating reserve less the availability of other revenues to meet a portion of these expenditures reduces the level of operation and maintenance expense to be recovered by water service charges to \$7,349,400. The allocation of each element of operating expense to cost components shown in Table 11 is performed in a similar manner to the allocation of plant value previously described.

The annual operating reserve requirement is allocated proportionately to the total of total operation and maintenance expense. Operation and maintenance expenses that are directly offset by other revenues have those revenue sources directly allocated to the appropriate cost component. For example, reimbursement of billing services, turn-on charges, and late payment penalties are directly allocated to the billing and collection cost component. Interest income is allocated based on the distribution of total operating expenses. The total net operation and maintenance expense to be recovered from charges for water service is shown on Line 23 of Table 11.

Distribution of Costs to Customer Classes

As a basis for determining the cost of water service to each customer class, the elements of cost of service previously allocated to functional cost components are distributed among the classes in proportion to their respective service requirements. Estimates of these

service requirements, or units of service, reflect the average number of accounts with recognition to relative meter sizes serving each account, annual water sales, and estimated peak water demands placed on the system by each customer class. Analysis of resulting costs of service to each class and comparison of allocated costs with revenues under existing rates provide a basis for future water rate adjustments.

Customer Classification

The customers of the water utility are currently separated into groups having similar service requirements and ownership status. These classes consist of Residential, Multifamily, Commercial, Municipal, Industrial, Kansas University, and Rural Water Districts.

For the water utility, special considerations are provided for the Rural Water Districts. These customers, by virtue of their service agreements, are not responsible for any costs related to the maintenance or investment in small water mains serving only retail customers, costs for municipal water usage, public fire protection costs, or any costs related to the purchase of raw water from the Clinton Reservoir.

Units of Service

The cost of service responsibility for base costs varies with the volume of water requirements and may be distributed to customer classes on that basis. Extra capacity costs are those costs associated with meeting peak rates of water use, and are distributed to customer classes on the basis of their respective system capacity requirements in excess of average requirement rates. Customer costs, which consist of meter related costs, and billing, collection and accounting costs, are allocated on the basis of the number of equivalent meters and monthly bills, respectively.

The estimated test year units of service requirements for the various customer classifications are shown in Table 12. Estimates of test year annual water requirements, shown in Column 1, are based on the projections of total water sales previously developed in this report. Average daily use of all water sales is presented in Column 2. Columns 3 through 8 of Table 12 show the estimated maximum day and maximum hour capacity factors for each customer class, the resulting demands, and extra capacity requirements, respectively. Estimates of peak requirements are based upon an analysis of available historic experience for the Lawrence area, supplemented by the results of detailed analyses of typical customer peak demand characteristics in other cities. Due to the peak demand diversity among the classes, the sum of the individual peak requirements for each class, which are noncoincident to the system, exceeds the experienced coincidental peak of the system.

Extra capacity requirements for fire protection service recognize, in part, peak fire flow requirements, and system capabilities determined during the most recent update of the City's water distribution master plan. Peak fire flow requirements for simultaneous fires of 2,000 gallons per minute (gpm) for 2 hours and 1,500 gpm for a 2 hour duration are used to establish the maximum day fire demand requirement. These demands are expressed over a 24 hour period to establish the maximum hour fire demand requirement for the City of Lawrence. Fire demand quantities have been assigned to public and private fire protection based on equivalent 6-inch hydrants and connections.

Customer related meter and service costs are allocated on the basis of the number of equivalent 5/8 inch meters serving each customer class. The number of equivalent meters in each customer class (Column 9) is estimated by relating typical costs for meters and services larger than 5/8 inch in size to the typical cost of a 5/8 inch meter and its related service line. Customer billing and accounting costs are distributed to classes on the basis of the number of bills for each customer class in Column 10 of Table 12.

Customer Class Costs of Service

Unit costs of service are developed by dividing the total cost allocated to each functional cost component by the total applicable units of service. The customer class responsibility for service is obtained by applying unit costs of service to the number of units for which the customer class is responsible.

The Lawrence water system has been built with provision for service to customers outside the City, yet the inside City customers must bear the responsibility for providing system facilities by undertaking the necessary investment. Revenues derived from outside City service should provide a margin of return on capital adequate to induce the citizens of Lawrence to bear the risks of providing outside City service. To recognize the proprietary interest and responsibility of inside City customers in the system, it is proper to charge outside City customers, in addition to their share of operating expense and depreciation, a reasonable return on their allocated portion of value. An 8.5 percent annual rate of return on the value of water utility facilities serving outside City customers is recognized for purposes of this study.

Table 13 shows the development of the unit costs of service applicable to each cost function. Lines 1 through 5 summarize the units of service developed in Table 12. Total allocated costs or investment shown on Lines 6, 8, and 10 were previously developed in Tables 11, 10, and 9 respectively. Unit costs of service for each cost component are determined simply by dividing the allocated cost or investment by the total units of service. Unit costs for outside City return on investment (Line 13) are determined by applying the 8.5 percent rate of return to the plant investment unit costs shown on Line 11. Outside City

return on investment (Line 15) is then derived by applying the outside City unit costs (Line 13) to outside City units of service (Line 4).

Total return on investment to be recovered from inside City customers is equal to the inside City return on investment unit costs (Line 12) applied to inside City units of service (Line 1). Total unit costs of service for inside and outside City customers are shown on Lines 16 and 17 of Table 13.

The costs of service allocated to customer classes are summarized in Table 14. Total costs of service for each class are based on unit costs of service from Table 13 and units of service from Table 12. Table 14a shows the portions of Table 14 that are applicable to the rural water districts and develops the proposed volume charge for test year 2005. A further discussion of this methodology is presented in the Water Rate Adjustments section of this report.

A comparison of the adjusted cost of service allocated to customer classes test year 2005 with estimated revenues from water sales at present rates is shown in Table 15. The cost of service has been adjusted for inside City customers to recover the cost of water used by the Municipal customer class and to recover the costs related to public and private fire protection. As indicated by Table 15, an overall water revenue increase of 4 percent is required for calendar year 2005.

Water Rate Adjustments

The principal consideration in the derivation of water rate schedules is the establishment of equitable charges to customers, commensurate with the cost of providing that service. The only method of assessing entirely equitable rates for water service would be the determination of each customer's bill based upon his particular service requirements. Since this is impractical without the use of special demand meters on every connection and extensive computer capabilities, rates are normally designed to meet average conditions for groups of customers having similar service requirements. Practicality also dictates the use of a rate schedule which is simple to apply, reasonably recovers costs proportionately from all classes, and is subject to as few misinterpretations as possible.

Existing Water Rates

The existing schedule of rates for water service became effective on January 1, 2004. These rates include a minimum bill, which varies by meter size, and a three-step declining block volume charge. The minimum bill includes a volume allowance of 2 thousand gallons (Mg) per month. Separate minimum bill and volume charges apply to inside and outside City customers. Inside City minimum charges range from \$6.55 for a 5/8-inch meter to \$120.00 for a 12-inch meter. Inside City volume charges for active customers range from \$2.52 per Mg for the first rate block to \$1.78 per Mg for the last rate block.

Rural water district customers pay a uniform volume charge for all water used based on the results of previous cost of service analyses.

Proposed Water Rates

The cost of service studies described in preceding sections of this report provide a basis for the design of a schedule of water rates to meet those costs. In order to recognize the significantly different characteristics of typical requirements for retail and wholesale service, separate forms of charge are appropriate for each of these respective types of service.

In developing proposed schedules of water rates, it must be recognized that the cost of service studies are the result of engineering estimates, based to some extent upon judgment and experience, and detailed results should not be used as literal and exact answers but as guides to the necessity for and nature of rate adjustments. Judgment must enter into the final choice of rates, and factors such as previous rate levels, economic impact on customers, public reaction to the magnitude of changes, and local practice in the past are commonly recognized in making rate adjustments. It is emphasized that all factors beyond cost of service considerations are strictly a matter of local policy.
Considerations recognized in the derivation of the proposed schedules of water rates subsequently presented herein, were developed based on discussions with City staff and policy direction obtained from the City Commission. These considerations include the indicated desire of the City to: (1) develop rate modifications so that the total revenues recovered from water charges will be adequate to recover the total annual requirements; (2) recover revenues from each class of water customer approximately equal to the allocated costs of providing service; and (3) adhere as closely as possible to cost of service rates for all inside and outside City water service customers, including rural water district customers. Discussion of several key factors and policy considerations were addressed during the study at three workshops held with City staff and the City Commission. These workshops resulted in City Commission approval of several key assumptions used in the study and approval to revise the water and wastewater rate structures. In attempting to meet the City's policy criteria and desired rate structure changes, proposed schedules of rates for water service are presented and discussed in the following paragraphs.

General Service

The proposed water rates shown in Table 16 significantly depart from the existing schedule of rates in order to recognize and reward conservation practices. This change is recommended primarily because automatic sprinkler systems have increased water usage of many residential accounts such that their total monthly water usage exceeds the normal usage limits designed into the existing declining block rate structure and allows their peak usage to be billed at a lower water rate. This results in many residential customers that intensively water their lawns being billed at a lower average cost than other residential customers that exert less demand on the water system. The lower water rate is available in the current declining block rate structure because it is designed for commercial customers that typically exert lower peak demands on the system than residential customers. Therefore, once a residential customer crosses this limit, they actually obtain water at a lower average cost than smaller residential customers that do not water as heavily and do not place as large of a peak demand on the water system. To correct this situation, we recommend that the City replace the declining block rate structure with a set of uniform volume charges by customer class. Under this system, all customers within a class will pay the same volume charge that reflects their average service requirements regardless of how much water they use. This is the same rate structure currently provided to the wholesale water customers and is the first step in phasing-in conservation based pricing signals for residential customers.

Recognizing that some residential customers put a much higher demand on the water system than other residential customers by extensively watering their lawns, it is recommended that the City phase-in an inverted rate block for residential customers so that the largest residential water users will pay a higher average price commensurate with the higher demands imposed on the system. Since residential costs are based on average demand characteristics, charging more for extensive lawn watering will result in lower average costs for normal residential customers. Initially it is proposed that the uniform residential rates proposed though 2006 be converted into a two-step inclining block rate in 2007 with the first block designed for normal residential customers who do not or only moderately water their lawns and the last block be designed at a higher rate to recognize the higher peak demands imposed by intensive lawn watering. We propose that the first or "normal" residential block be initially set at 20,000 gallons, the same usage block established by the existing declining block rate structure. This usage allowance is proposed to decrease to 15,000 gallons in 2008 and to 10,000 gallons in 2009 and subsequent years. The proposed plan results in a threeyear phase-in period for the new inverted block residential rate structure. It is estimated that about 88 percent of all inside City residential water usage will be billed at the normal residential rate in 2007 and that about 77 percent of all inside City residential usage will be billed at the normal residential rate in 2009. When fully implemented, the last block of the new rate structure will only apply to about 13 percent of the residential customers.

Under current practice, water use charges for apartments are computed by dividing the total metered water use by the number of dwelling units and computing charges as if each were a separate customer served by a 5/8-inch water meter. This procedure does not provide for the recovery of costs strictly in accordance with cost of service principles. However, the implementation of a uniform volume charge for this class will make the billing practice more equitable. Because master metering of apartments can promote water waste, the City encourages individual metering of each unit as a conservation measure. The current apartment billing practice is intended to promote individual metering. In recognition of this City policy, the rates proposed in Table 16 assumes that the current apartment billing procedure will be continued through the year 2009.

Rural Water District Service

Water charges to rural water district or wholesale customers are proposed to continue the form of the existing rate schedule The volume rates for existing wholesale customers are projected as follows:

	Indicated
Year	Rate
	\$/Mg
2005	2.25
2006	2.41
2007	2.47
2008	2.63
2009	2.72

Table 14a shows the detailed development of the proposed volume charge applicable wholesale customers in calendar year 2005. Unit costs shown in this table are common to all outside city customer classes and are equal to the total unit costs applied to other outside city customers in Table 14. The individual components of the outside City unit costs are developed in Table 13. These unit costs are applied to the units of service assigned to wholesale customers in Table 12 to determine allocated cost of service. The volume portion of total allocated cost of service is divided by the projected annual water usage to determine the volume charge for calendar year 2005. Indicated volume charges for 2006 through 2009 are based on the methodology previously described and developed by Table 14a.

Water Service Revenue Under Proposed Rates

A comparison of the estimated test year revenue under the proposed rates with allocated costs of service for each of the customer classes is shown in Table 17. This comparison indicates the proposed rates will recover revenues from each customer class reasonably commensurate with the cost of service and practical considerations and criteria previously noted.

Table 1Water UtilityHistorical and ProjectedNumber of Customers and Water Sales Volume

	Average Number of Customer Accounts				Water Sales Volume						
Year	Residential	Multifamily	Other (a)	Total	Residential	Multifamily	RWD	KU	Industrial	Other (b)	Total
					Mg	Mg	Mg	Mg	Mg	Mg	Mg
					Hi	istorical					
1999	23,825	702	1,840	26,367	1,663,098	328,556	432,297	234,784	329,131	849,069	3,836,935
2000	24,524	706	1,879	27,109	1,904,549	344,516	486,271	263,011	351,583	1,032,719	4,382,649
2001	25,189	725	1,900	27,814	1,749,336	358,248	574,738	241,400	350,417	853,055	4,127,194
2002	25,904	737	1,935	28,576	1,949,449	338,280	495,386	249,368	331,535	990,249	4,354,266
2003	26,457	746	1,964	29,167	1,980,616	335,788	485,206	241,483	204,107	973,689	4,220,889
					Pr	ojected					
2004	27,010	760	2,000	29,770	2,010,900	340,500	495,500	241,400	209,300	987,500	4,285,100
2005	27,560	770	2,030	30,360	2,051,800	345,000	506,000	241,400	214,600	1,001,300	4,360,100
2006	28,110	780	2,070	30,960	2,092,800	349,500	516,800	241,400	219,800	1,015,000	4,435,300
2007	28,660	790	2,100	31,550	2,133,800	354,000	527,800	241,400	225,100	1,028,800	4,510,900
2008	29,210	800	2,130	32,140	2,174,800	358,500	539,100	241,400	230,300	1,042,600	4,586,700
2009	29,760	810	2,170	32,740	2,215,700	363,000	550,700	241,400	235,600	1,056,300	4,662,700

(a) Includes all commercial, KU, industrial, RWD, and municipal accounts.

(b) Includes commercial and non-billed municipal water usage.

RWD - Rural Water Districts

KU - Kansas University

Mg - thousand gallons

Table 2 Water Utility Historical and Projected Revenue Under Existing Rates

		System				
	Other	Development		Other Non-		
Water Sales	Operating	Charge	Interest	Operating	Total	
Revenue (a)	Revenue	Revenue	Income (b)	Revenue	Revenue	
\$	\$	\$	\$	\$	\$	
		Historical				
9,594,302	316,683	460,703	324,679	7,150	10,703,517	
10,514,492	343,444	388,609	339,359	7,600	11,593,504	
10,274,543	339,471	383,196	295,251	10,969	11,303,430	
10,546,598	327,197	408,720	166,777	22,450	11,471,742	
10,185,103	347,635	454,945	151,867	16,275	11,155,824	
		Projected				
10,532,200	335,000	400,000	210,300	13,000	11,490,500	
10,730,700	335,000	400,000	245,600	13,000	11,724,300	
10,929,400	335,000	400,000	217,000	13,000	11,894,400	
11,129,100	335,000	400,000	219,100	13,000	12,096,200	
11,329,300	335,000	400,000	215,100	13,000	12,292,400	
11,529,800	335,000	400,000	236,600	13,000	12,514,400	
	Water Sales Revenue (a) \$ 9,594,302 10,514,492 10,274,543 10,546,598 10,185,103 10,532,200 10,730,700 10,929,400 11,129,100 11,329,300 11,529,800	Water Sales Revenue (a)Other Operating Revenue $9,594,302$ $316,683$ $10,514,492$ $343,444$ $10,274,543$ $39,471$ $10,546,598$ $327,197$ $10,185,103$ $347,635$ $10,532,200$ $335,000$ $10,730,700$ $335,000$ $11,129,100$ $335,000$ $11,329,300$ $335,000$ $11,529,800$ $335,000$	$\begin{array}{c cccc} & & & & & & \\ & & & & \\ & & & \\ & & & \\ \hline \hline & & \\ \hline \hline \hline & & \\ \hline \hline & & \\ \hline \hline \hline \\ $	$\begin{array}{c ccccc} System \\ Other & Development \\ \hline \\ Water Sales & Operating \\ \hline \\ Revenue (a) \\ \hline \\ \$ & \hline \\ \hline \\ \$ & \hline \\ \hline \\ \$ & \hline \\ \hline$	$\begin{array}{c cccccccccccc} System \\ \hline Other & Development & Other Non-\\ \hline Water Sales & Operating \\ \hline Revenue (a) \\ \hline \$ & \hline \\ \hline \cr \cr \$ & \hline \\ \hline \cr \cr \$ & \hline \\ \hline \cr \$ & \hline \cr \cr \cr \cr \$ & \hline \cr \cr \cr \$ & \hline \cr \cr \cr \cr \$ & \hline \cr \cr \cr \cr \$ & \hline \cr \cr \cr \$ & \hline \cr \cr \cr \cr \$ & \hline \cr \cr \cr \$ & \hline \cr \cr$	

(a) Projected water sales revenue based on rates in effect January 1, 2004.

(b) Includes interest earned on construction funds.

Table 3
Water Utility
Historical and Projected
Operation and Maintenance Expense

			Customers										
			Meters &	Admin. &									
	Treatment	Distribution	Billing	General									
Year	Expense	Expense	Expense	Expense	Total								
	\$	\$	\$	\$	\$								
	Historical												
1999	2,498,414	1,514,025	420,100	631,000	5,063,539								
2000	2,940,017	1,508,191	416,400	619,500	5,484,107								
2001	3,058,383	1,538,472	448,000	733,900	5,778,755								
2002	3,056,998	1,906,878	522,000	683,600	6,169,476								
2003	3,173,174	1,933,690	550,000	820,400	6,477,264								
		Proje	cted										
2004	3,741,300	2,078,000	592,000	768,700	7,180,000								
2005	4,098,900	2,168,100	617,900	807,100	7,692,000								
2006	4,579,500	2,262,400	645,000	862,700	8,349,600								
2007	4,468,000	2,361,000	673,300	877,700	8,380,000								
2008	4,664,900	2,464,000	703,200	918,500	8,750,600								
2009	4,870,200	2,571,700	734,300	960,200	9,136,400								

Historical and Projected Operation and Maintenance Expense



Table 4 Water Utility Major Capital Improvement Program

Line								
No.	Description	2004	2005	2006	2007	2008	2009	Total
		\$	\$	\$	\$	\$	\$	\$
1	Kaw WTP Supply Improvements (c)	97,000	501,000	0	0	0	0	598,000
2	Bowersock Dam Maintenance & Improvements (c)	0	0	0	1,170,000	0	0	1,170,000
3	Residuals Monofill (b)	1,040,000	0	0	0	0	0	1,040,000
4	Kaw WTP - Central Service Level Discharge Piping Modifications (c)	0	811,000	0	0	0	0	811,000
5	Kaw WTP - High Service HSKW (c)	0	0	0	0	158,000	0	158,000
6	Clinton WTP Expansion (a)	548,000	2,920,000	5,259,000	0	0	0	8,727,000
7	Clinton WTP - High Service HSCW (a)	0	0	326,000	0	0	0	326,000
8	Clinton WTP - High Service HSBA (a)	151,000	473,000	492,000	0	0	0	1,116,000
9	Operations and Maintenance Building (c)	0	0	0	0	1,139,000	4,737,000	5,876,000
10	30" Main - 8th St/Tennessee/9th St (a) (c)	0	0	0	0	441,000	1,376,000	1,817,000
11	30" Main - Indiana St from 5th to 8th St (a) (c)	0	0	0	231,000	721,000	0	952,000
12	36" Main - Indiana St From Kaw WTP to 5th St (a) (c)	0	0	0	237,000	739,000	0	976,000
13	16" Main - W 6th from Wakarusa Dr to 6th St (West) Elevated Tank (a)	624,000	0	0	0	0	0	624,000
14	12" Main - W 6th from Deer Tun to 6th St (West) Elevated Tank (a)	281,000	0	0	0	0	0	281,000
15	12" Main - W 6th from 6th St (West) Elevated Tank to K-10 (a)	374,000	0	0	0	0	0	374,000
16	16" Main - W 6th from 6th St (West) Elevated Tank to K-10 (a)	551,000	0	0	0	0	0	551,000
17	Storage Facility T1 - 6th Street (West) Elevated Tank (a)	0	0	0	1,685,000	0	0	1,685,000
18	Repaint Kasold Ground Storage Tank (c)	395,000	0	0	0	0	0	395,000
19	Repaint Clinton WTP Ground Storage Tanks (c)	0	0	0	796,000	0	0	796,000
20	Waterline Rehabilitation and Replacement Program (a) (c)	1,040,000	1,082,000	1,125,000	1,170,000	1,217,000	1,265,000	6,899,000
21	Security Improvements (b)	416,000	541,000	562,000	585,000	730,000	0	2,834,000
22	Misc Water System Improvements (b) (c)	1,040,000	1,082,000	1,125,000	1,170,000	1,217,000	1,265,000	6,899,000
23	KAW WTP - LT2ESWTR - UV (b)	0	0	0	0	0	523,000	523,000
24	Clinton WTP - LT2ESWTR - UV (b)	0	0	0	0	0	523,000	523,000
25	Total Capital Improvements	6,557,000	7,410,000	8,889,000	7,044,000	6,362,000	9,689,000	45,951,000

(a) Project required to meet anticipated growth related requirements.

(b) Project required by EPA and KDHE regulations.

(c) Project required to improve system reliability or transmission capacity.

Table 5Water UtilityMajor Capital Improvement Program Financing

Line								
No.		2004	2005	2006	2007	2008	2009	Total
		\$	\$	\$	\$	\$	\$	\$
	Source of Funds							
1	Beginning of Year Balance	4,023,400	1,623,500	8,214,500	2,029,100	7,421,100	3,671,200	4,023,400
2	Bond Proceeds	0	11,300,000	0	10,900,000	0	13,000,000	35,200,000
3	SRF Loan Proceeds	0	0	0	0	0	0	0
4	Cash Financing of Construction	4,100,000	3,700,000	2,600,000	2,500,000	2,500,000	2,500,000	17,900,000
5	Interest Income	57,100	116,100	103,600	111,600	112,100	140,700	641,200
6	Total Funds Available	8,180,500	16,739,600	10,918,100	15,540,700	10,033,200	19,311,900	57,764,600
	Application of Funds							
7	Major Capital Improvements	6,557,000	7,410,000	8,889,000	7,044,000	6,362,000	9,689,000	45,951,000
8	Bond Issuance Costs	0	169,500	0	163,500	0	195,000	528,000
9	SRF Loan Issuance Costs	0	0	0	0	0	0	0
10	Deposits to Bond Reserve Fund	0	945,600	0	912,100	0	1,087,800	2,945,500
11	Total Funds Applied	6,557,000	8,525,100	8,889,000	8,119,600	6,362,000	10,971,800	49,424,500
12	End of Year Fund Balance	1,623,500	8,214,500	2,029,100	7,421,100	3,671,200	8,340,100	8,340,100

Table 6Water UtilityDebt Service on Outstanding and Proposed Bonds

Year	Existing Revenue Bonds \$	Proposed Revenue Bonds \$	Existing SRF Loans \$	Proposed SRF Loans \$	\$						
Deposits to Principal and Interest Account											
2004	0	0	937,200	0	937,200						
2005	0	551,600	937,200	0	1,488,800						
2006	0	945,600	937,200	0	1,882,800						
2007	0	1,477,700	937,200	0	2,414,900						
2008	0	1,857,700	937,200	0	2,794,900						
2009	0	2,492,300	937,200	0	3,429,500						
	Pa	yments to l	Bondholder	5							
2004	0	0	937,200	0	937,200						
2005	0	310,800	937,200	0	1,248,000						
2006	0	945,600	937,200	0	1,882,800						
2007	0	1,245,400	937,200	0	2,182,600						
2008	0	1,857,700	937,200	0	2,794,900						
2009	0	2,215,200	937,200	0	3,152,400						

Historical & Projected Water Debt Service Payments



Table 7Water UtilityComparison of Projected Revenue Under IndicatedRevenue Adjustments With Projected Revenue Requirements

Line								
No.	Descriptio	n		2005	2006	2007	2008	2009
				\$	\$	\$	\$	\$
1	Revenue Und Additional Re	ler Existing Rate evenue Required	es 1	10,730,700	10,929,400	11,129,100	11,329,300	11,529,800
		Revenue	Months					
	Year	Increase	Effective					
2	2005	4.0%	12	429,200	437,200	445,200	453,200	461,200
3	2006	4.0%	12		454,700	463,000	471,300	479,600
4	2007	4.0%	12			481,500	490,200	498,800
5	2008	4.0%	12				509,800	518,800
6	2009	4.0%	12					539,500
7	Subtotal			429,200	891,900	1,389,700	1,924,500	2,497,900
8	Total Service	Charge Revenu	ie	11,159,900	11,821,300	12,518,800	13,253,800	14,027,700
9	Other Operat	ing Revenue		335,000	335,000	335,000	335,000	335,000
10	Other Non-O	perating Revenu	ie	13,000	13,000	13,000	13,000	13,000
11	System Devel	lopment Charge	Revenue	400,000	400,000	400,000	400,000	400,000
12	Interest Incor	ne - Operations		129,500	113,400	107,500	103,000	95,900
13	Interest Income - Reserve Funds			160,700	181,600	202,400	222,800	248,700
14	Total Revenu	le		12,198,100	12,864,300	13,576,700	14,327,600	15,120,300
15	Operation and	d Maintenance I	Expense	7,692,000	8,349,600	8,380,000	8,750,600	9,136,400
16	Net Revenue			4,506,100	4,514,700	5,196,700	5,577,000	5,983,900
	Debt Service							
17	Existing Re	evenue Bonds		0	0	0	0	0
18	Proposed R	evenue Bonds		551,600	945,600	1,477,700	1,857,700	2,492,300
19	Total Revenu	e Bonds		551,600	945,600	1,477,700	1,857,700	2,492,300
20	Existing SR	RF Loans		937,200	937,200	937,200	937,200	937,200
21	Proposed S	RF Loans		0	0	0	0	0
22	Total Debt Se	ervice		1,488,800	1,882,800	2,414,900	2,794,900	3,429,500
23	Routine Capi	tal Additions		384,900	400.200	407,800	420,200	432,800
24	Deposits to C	perating Reserv	ve	162.100	7.500	91.400	95.100	99,400
25	Cash Financi	ng of Constructi	on	3,700,000	2,600,000	2,500,000	2,500,000	2,500,000
26	Net Annual B	Balance		(1,229,700)	(375,800)	(217,400)	(233,200)	(477,800)
27	Beginning of	Year Balance (a	a)	7,088,500	5,858,800	5,483,000	5,265,600	5,032,400
28	End of Year I	Balance (a)		5,858,800	5,483,000	5,265,600	5,032,400	4,554,600

(a) Excludes operating reserve, bond reserve and meter deposits.

Table 8 Water Utility Cost of Service Test Year 2005

Line		Operating	Capital	
No.		Expense	Cost	Total
		\$	\$	\$
	Revenue Requirements			
1	Operation & Maintenance Expense	7,692,000		7,692,000
2	Debt Service Requirements		1,488,800	1,488,800
3	Routine Capital Additions		384,900	384,900
4	Operating Reserve	162,100		162,100
5	Cash Financing of Construction		3,700,000	3,700,000
6	Total	7,854,100	5,573,700	13,427,800
	Revenue Requirements Met f	rom Other S	ources	
7	Other Operating Revenue	335,000		335,000
8	Other Nonoperating Revenue		13,000	13,000
9	System Development Charge Revenue		400,000	400,000
10	Interest Income	169,700	120,500	290,200
11	Change in Funds Available		1,229,700	1,229,700
12	Full Year Rate Adjustment		0	0
13	Total	504,700	1,763,200	2,267,900
14	Net Costs to be Met from Charges	7,349,400	3,810,500	11,159,900
	Restatement of Net Costs (Ut	ility Basis)		
15	Operation & Maintenance Expense	7.349.400		7.349.400
16	Depreciation Expense	.,,	2.134.400	2.134.400
17	Return on Investment		1,676,100	1,676,100
			, , -	, ,

 18
 Total

 7,349,400
 $\overline{3,810,500}$

 11,159,900

Table 9 Water Utility Allocation of Net Plant Investment **To Functional Cost Components** Test Year 2005

					Common to All		Common to Retail				
		Net		Extra C	apacity		Extra C	apacity			
Line No.	Description	scription Plant Investment \$	Base	Maximum Base Day	Maximum Hour	Base	Maximum Day	Maximum Hour	Meters & Services \$	Direct Fire Protection	
			\$	\$	\$	\$	\$	\$		\$	
1	Land	198,000	198,000								
2	Supply	2,345,200	2,110,700	234,500							
3	Treatment	17,572,800	7,995,600	9,577,200							
4	Pumping	3,199,100	1,033,300	1,238,100	927,700						
	Distribution System										
5	Large Mains	13,503,000	4,361,500	5,225,700	3,915,800						
6	Small Mains	10,002,000				3,230,600	3,870,800	2,900,600			
7	Meters	1,000,000							1,000,000		
8	Hydrants	501,000								501,000	
9	Total Distribution	25,006,000	4,361,500	5,225,700	3,915,800	3,230,600	3,870,800	2,900,600	1,000,000	501,000	
10	Treated Water Storage	949,400	306,700	367,400	275,300						
11	Subtotal	49,270,500	16,005,800	16,642,900	5,118,800	3,230,600	3,870,800	2,900,600	1,000,000	501,000	
12	General Plant	494,000	160,500	166,900	51,300	32,400	38,800	29,100	10,000	5,000	
13	Total	49,764,500	16,166,300	16,809,800	5,170,100	3,263,000	3,909,600	2,929,700	1,010,000	506,000	

Table 10Water UtilityAllocation of Depreciation ExpenseTo Functional Cost ComponentsTest Year 2005

					Common to All			Common to Retail				
				Extra C	apacity		Extra C	apacity				
Line		ription Expense		Maximum	Maximum		Maximum Day	Maximum	Meters &	Direct Fire Protection		
No.	Description		Base	Day	Hour	Base		Hour	Services			
		\$	\$	\$	\$	\$	\$	\$	\$	\$		
1	Supply	96,800	87,100	9,700								
2	Treatment	571,200	259,900	311,300								
3	Pumping	303,900	98,200	117,600	88,100							
	Distribution System											
4	Large Mains	539,900	174,400	208,900	156,600							
5	Small Mains	400,000				129,200	154,800	116,000				
6	Meters	40,000							40,000			
7	Hydrants	20,000								20,000		
8	Total Distribution	999,900	174,400	208,900	156,600	129,200	154,800	116,000	40,000	20,000		
9	Treated Water Storage	55,600	18,000	21,500	16,100							
10	Subtotal	2,027,400	637,600	669,000	260,800	129,200	154,800	116,000	40,000	20,000		
11	General Plant	107,000	93,000	6,700	2,600	1,300	1,600	1,200	400	200		
12	Total	2,134,400	730,600	675,700	263,400	130,500	156,400	117,200	40,400	20,200		

Table 11Water UtilityAllocation of Operation & Maintenance Expenseto Functional Cost ComponentsTest Year 2005

			Common to All			Retail Service Only					
Line No.	Description	Total O&M Cost	Base Cost	Maximum Day Cost	Maximum Hour Cost	Meter Reading & Billing	Base Cost	Maximum Day Cost	Maximum Hour Cost	Meters & Services Cost	Fire Protection Cost
		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1 2 3 4 5	Treatment Plant Chemicals Power Raw Water Other Subtotal	596,200 236,600 243,300 939,400 2,015,500	596,200 212,900 $427,400$ $1 236,500$	23,700 512,000 535,700			243,300				
6 7 8	High Service Pumping Power Other Subtotal	354,800 <u>1,409,200</u> <u>1,764,000</u>	319,300 455,200 774,500	$ \begin{array}{r} 17,700 \\ 545,400 \\ \overline{563,100} \end{array} $	$ 17,800 \\ 408,600 \\ \overline{426,400} $		213,300				
9 10 11 12 13	Transmission & Distribution Large Mains Storage Small Mains Services & Meters Fire Protection	542,100 325,200 867,200 325,200 108,400	175,100 32,500	209,800	157,200 292,700		280,100	335,600	251,500	325,200	108,400
14	Subtotal	2,168,100	207,600	209,800	449,900		280,100	335,600	251,500	325,200	108,400
15	Billing & Collection	617,900				617,900					
16	Water Quality Control	319,400	319,400								
17	Admin. and General	779,200	201,400	181,000	122,700	88,300	40,000	47,900	35,900	46,500	15,500
18	Bad Debt Expense	27,900				27,900					
19	Total O&M Expense	7,692,000	2,739,400	1,489,600	999,000	734,100	563,400	383,500	287,400	371,700	123,900
20	Operating Reserve	162,100	57,600	31,400	21,100	15,500	11,900	8,100	6,100	7,800	2,600
21	Other Revenue	(335,000)				(335,000)					
22	Interest Income	(169,700)	(60,500)	(32,900)	(22,000)	(16,200)	(12,400)	(8,500)	(6,300)	(8,200)	(2,700)
23	Net O&M Cost	7,349,400	2,736,500	1,488,100	998,100	398,400	562,900	383,100	287,200	371,300	123,800

Table 12 Water Utility Units of Service Test Year 2005

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Water	Usage	Ν	Maximum Day		Ν	laximum Hour	<u>.</u>	Equivalent	
Line No.	2	Annual	Average Day	Capacity Factor	Total Capacity	Extra Capacity	Capacity Factor	Total Capacity	Extra Capacity	Meters & Services	Bills
	-	Mg	Mgd		Mgd	Mgd		Mgd	Mgd		
			(1)/365		(2) x (3)	(4) - (2)		(2) x (6)	(7) - (4)		
	Inside City										
1	Residential	2,046,700	5,607	275%	15,419	9,812	425%	23,830	8,411	27,955	329,676
2	Multifamily	344,600	944	225%	2,124	1,180	350%	3,304	1,180	8,288	99,456
3	Commercial	806,500	2,210	200%	4,420	2,210	300%	6,630	2,210	3,152	21,084
4	Municipal	107,600	295	200%	590	295	300%	885	295	141	1,692
5	Industrial	106,200	291	175%	509	218	260%	757	248	285	972
6	KU	241,400	661	200%	1,322	661	300%	1,983	661	291	384
7	Public Fire Protection				390	390		4,681	4,291		
8	Private Fire Protection				30	30		359	329	0	279
9	Total Inside City	3,653,000	10,008		24,804	14,796		42,429	17,625	40,111	453,543
	Outside City										
10	Residential	5,100	14	275%	39	25	425%	60	21	85	1,008
11	Multifamily	400	1	225%	2	1	350%	4	2	4	48
12	Commercial	87,200	239	200%	478	239	300%	717	239	46	96
13	Industrial	108,400	297	175%	520	223	260%	772	252	53	36
14	Subtotal Outside City	201.100	551		1.039	488		1.553	514	188	1.188
15	Rural Water Districts	506,000	1,386	250%	3,465	2,079	375%	5,198	1,733		2
16	Total Outside City	707,100	1,937		4,504	2,567		6,751	2,247	188	1,188
17	Total	4,360,100	11,945		29,308	17,363		49,180	19,872	40,299	454,731

Mg - 1,000 gallons Mgd - 1,000 gallons per day

Table 13 Water Utility Unit Cost of Service Test Year 2005

		(1)	(2)	(3) Common	(4) n to All	(5)	(6)	(7) Retail Serv	(8) vice Only	(9)	(10)
				Extra Capacity		Meter		Extra Capacity			Public
Line No.		Total	Base	Maximum Day	Maximum Hour	Reading & Billing	Base	Maximum Day	Maximum Hour	Meters & Services	Fire Protection
	-	\$	Mg	Mgd	Mgd	Bills	Mg	Mgd	Mgd	Equiv.	Hydrants
	Units of Service									Meters	
1	Inside City Outside City		3,653,000	14,796	17,625	453,543	3,653,000	14,796	17,625	40,111	2,790
2	Retail		201,100	488	514	1,188	201,100	488	514	188	
3	Wholesale		506,000	2,079	1,733	0					
4	Total Outside City		707,100	2,567	2,247	1,188	201,100	488	514	188	
5	Total System		4,360,100	17,363	19,872	454,731	3,854,100	15,284	18,139	40,299	2,790
	Costs of Service										
	Net Operating Expense										
6	Total Cost - \$	7,349,400	2,736,500	1,488,100	998,100	398,400	562,900	383,100	287,200	371,300	123,800
7	Unit Cost - \$/unit		0.62762	85.70524	50.22645	0.87612	0.14605	25.06543	15.83329	9.21364	44.37276
0	Depreciation Expense	2 124 400	720 (00	(75 700	2(2,400		120 500	156 400	117 200	40,400	20,200
8	I otal Cost - 5	2,134,400	/30,600	6/5,/00 28.01600	263,400		130,500	156,400	6 46122	40,400	20,200
9	Net Plant Investment		0.10750	38.91009	13.23485		0.03380	10.23292	0.40122	1.00251	7.24014
10	Total Cost - \$	49,764,500	16 166 300	16 809 800	5 170 100		3 263 000	3 909 600	2,929,700	1.010.000	506.000
11	Unit Cost - \$/unit	,	3.70778	968.13915	260.17009		0.84663	255,79691	161.51387	25.06269	181.36201
	Return on Investment										
	Unit Cost - \$/unit										
12	Inside		0.09842	25.69859	6.90604		0.02247	6.78995	4.28727	0.66527	4.81413
13	Outside		0.31516	82.29183	22.11446		0.07196	21.74274	13.72868	2.13033	15.41577
	Total Cost										
14	Inside City Cost - \$	1,159,700	359,500	380,200	121,700		82,100	100,500	75,600	26,700	13,400
15	Outside City Cost - \$	516,400	222,900	211,200	49,700		14,500	10,600	7,100	400	
	Total	1,676,100	582,400	591,400	171,400		96,600	111,100	82,700	27,100	13,400
	Total Unit Cost of Service										
16	Inside City - \$/unit		0.89361	150.31991	70.38732	0.87612	0.20239	42.08830	26.58178	10.88142	56.42703
17	Outside City - \$/unit		1.11035	206.91315	85.59574	0.87612	0.25188	57.04109	36.02318	12.34648	
	Total Cost of Service										
18	Inside City - \$	9,551,100	3,264,600	2,224,100	1,240,600	397,400	739,300	622,700	468,500	436,500	157,400
19	Outside City - \$	1,608,800	785,100	531,100	192,300	1,000	50,700	27,800	18,500	2,300	0
20	Total	11,159,900	4,049,700	2,755,200	1,432,900	398,400	790,000	650,500	487,000	438,800	157,400

Mg - 1,000 gallons Mgd - 1,000 gallons per day

Table 14Water UtilityAllocated Costs of Service to Customer ClassesTest Year 2005

		Common to All Retail Service Only									
				Extra C	apacity	Meter	Extra C		apacity		Public
Line				Maximum	Maximum	Reading &		Maximum	Maximum	Meters &	Fire
No.		Total	Base	Day	Hour	Billing	Base	Day	Hour	Services	Protection
		\$									
		.									
	Unit Cost of Servic	e - \$/unit									
1	Inside City		0.89361	150.31991	70.38732	0.87612	0.20239	42.08830	26.58178	10.88142	56.42703
2	Outside City		1.11035	206.91315	85.595/4	0.8/612	0.25188	57.04109	36.02318	12.34648	
	Allocation to Custo	mer Classe	es								
	Inside City										
	Residential										
3	Units of Service		2,046,700	9,812	8,411	329,676	2,046,700	9,812	8,411	27,955	
4	Allocated Cost - \$	5,539,500	1,829,200	1,474,800	591,800	288,900	414,200	412,900	223,500	304,200	
~	Multifamily		244.600	1 100	1 100	00.456	244 600	1 100	1 100	0.000	
5	Allocated Cost	806 500	344,600	1,180	1,180	99,456	344,600	1,180	1,180	8,288	
0	Commercial	890,500	507,900	177,400	85,100	87,100	09,700	49,700	51,400	90,200	
7	Units of Service		806,500	2.210	2.210	21.084	806,500	2.210	2.210	3,152	
8	Allocated Cost - \$	1,576,200	720,700	332,200	155,600	18,500	163,200	93,000	58,700	34,300	
	Municipal										
9	Units of Service		107,600	295	295	1,692	107,600	295	295	141	
10	Allocated Cost - \$	206,300	96,200	44,300	20,800	1,500	21,800	12,400	7,800	1,500	
	Industrial		106 000	210	240	070	106 200	210	240	205	
11	Units of Service	196 500	106,200	218	248	972	106,200	218	248	285	
12	Kansas University	186,500	94,900	52,800	17,500	900	21,500	9,200	0,000	3,100	
13	Units of Service		241 400	661	661	384	241 400	661	661	291	
14	Allocated Cost - \$	459,400	215,700	99,400	46,500	300	48,900	27,800	17,600	3,200	
	Public Fire Protection										
15	Units of Service			390	4,291			390	4,291		2,790
16	Allocated Cost - \$	648,500		58,600	302,000			16,400	114,100		157,400
	Private Fire Protection										
17	Units of Service	27.000		30	329	279		30	329	0	
10	Allocated Cost - 5	37,900		4,300	23,200	200		1,300	8,700		
19	Total Inside City	9,550,800	3,264,600	2,224,000	1,240,500	397,400	739,300	622,700	468,400	436,500	157,400
	Outside City Retail										
20	Residential		5 100	25		1 000	5 100	25		0.5	
20	Allocated Cost	18 100	5,100	23 5 200	1 200	1,008	5,100	1 400	21	1 000	
21	Multifamily	18,100	5,700	3,200	1,800	900	1,500	1,400	800	1,000	
22	Units of Service		400	1	2	48	400	1	2	4	
23	Allocated Cost - \$	1,100	400	200	200	0	100	100	100	0	
	Commercial										
24	Units of Service		87,200	239	239	96	87,200	239	239	46	
25	Allocated Cost - \$	211,700	96,800	49,500	20,500	100	22,000	13,600	8,600	600	
20	Industrial		100 400	222	252	26	100 400	222	252	52	
20	Allocated Cost - \$	237 900	108,400	223 46 100	252	36	108,400	12 700	252	5 <i>5</i> 700	
21		460.000	222,200	40,100	21,000		27,300		9,100		
28	Subtotal Outside City	468,800	223,300	101,000	44,100	1,000	50,700	27,800	18,600	2,300	
	Rural Water Districts										
29	Units of Service	1 1 /0 200	506,000	2,079	1,733	0					
30	Affocated Cost - \$	1,140,300	561,800	430,200	148,300	0					
31	Total System	11,159,900	4,049,700	2,755,200	1,432,900	398,400	790,000	650,500	487,000	438,800	157,400

Table 14a
Water Utility
Allocated Costs of Service to Rural Water Districts
Test Year 2005
Allo

				Common	n to All	
				Extra C	apacity	Meter
Line				Maximum	Maximum	Reading &
No.		Total	Base	Day	Hour	Billing
		\$				
	Unit Cost of Service - \$/unit					
1	Operation & Maintenance Expense		0.62762	85.70524	50.22645	0.87612
2	Depreciation Expense		0.16756	38.91609	13.25483	
3	Return on Investment		0.31516	82.29183	22.11446	
4	Total		1.11035	206.91315	85.59574	0.87612
5	Units of Service		506,000	2,079	1,733	0
			Mg	Mgd	Mgd	Equiv.
	Allocated Cost of Service - \$					Bills
6	Operation & Maintenance Expense	582,700	317,500	178,200	87,000	0
7	Depreciation Expense	188,700	84,800	80,900	23,000	0
8	Return on Investment	368,900	159,500	171,100	38,300	0
9	Total	1,140,300	561,800	430,200	148,300	0
10	Less Billing Costs	0				
11	Volume Related Costs	1,140,300				
12	Billable Volume	506,000	Mg			
13	Proposed Volume Charge	2.25	/Mg			
	Mg - 1,000 gallons Mad - 1,000 gallons per day					
	115u 1,000 ganons per uay					

Table 15 Water Utility Comparison of Allocated Cost of Service with Revenue Under Existing Rates Test Year 2005

		(1)	(2)	(3)
			Revenue	
		Adjusted	Under	Indicated
Line		Cost of	Existing	Revenue
No.		Service	Rates	Adjustment
		\$	\$	
	Inside City			
1	Residential	7,099,600	6,770,400	4.9%
2	Non-Residential	2,451,200	2,444,800	0.3%
3	Total Inside City	9,550,800	9,215,200	3.6%
	Outside City			
4	Residential	19,200	20,900	-8.1%
5	Non-Residential	449,600	426,900	5.3%
6	Subtotal Outside City	468,800	447,800	4.7%
7	Rural Water Districts	1,140,300	1,067,700	6.8%
8	Total Outside City	1,609,100	1,515,500	6.2%
9	Total Water Utility	11,159,900	10,730,700	4.0%

Table 16 Water Utility Existing and Proposed Water Rates

	Existing	Proposed Water Rates						
	Water Rates	2005	2006	2007	2008	2009		
Incido City Limite								
Monthly Volume Charge	5/1 000 gallons							
First 2 000 gallons	Minimum							
Next 18 000 gallons	2.52							
Next 18,000 gallons	2.32							
Over 500,000 gallons	1.92							
Residential								
First Block (a)		2.67	2.78	2.88	2.93	2.97		
All Other Usage		2.67	2.78	3.10	3 42	3 74		
Multifamily		2.31	2.40	2.49	2.57	2.69		
Commercial		2.05	2.13	2.12	2.30	2.39		
Industrial		1.88	1 94	2.03	2.10	2.18		
Monthly Charge - \$/Bill		1.00	1.91	2.05	2.10	2.10		
Meter Size - Inches								
5/8 and $3/4$	6 5 5	1.95	1.95	2 10	2 20	2 25		
1	8.90	2 35	2 35	2.10	2.20	2.23		
1 1/2	9.70	2.33	2.35	2.50	3.00	3.20		
2	12.30	3.90	3.90	2.90	4.20	5.20 4.40		
2	21.00	12.00	12.00	12.50	12.00	12.00		
3	31.00	12.00	12.00	12.50	15.00	16.50		
4	59.00	13.00	13.00	13.30	10.00	24.00		
0	38.00	22.00	22.00	25.00	23.00	24.00		
8	/9.00	30.00	30.00	31.00	32.00	33.00		
10	96.00	39.00	39.00	41.00	42.00	43.00		
12	120.00	46.00	46.00	48.00	49.00	51.00		
Outside City Limits								
Monthly Volume Charge - S	6/1,000 gallons							
First 2,000 gallons	Minimum							
Next 18,000 gallons	3.15							
Next 480,000 gallons	2.65							
Over 500,000 gallons	2.12							
Residential								
First Block (a)		3.26	3.46	3.54	3.62	3.70		
All Other Usage		3.26	3.46	4.08	4.71	5.33		
Multifamily		2.50	2.99	3.15	3.31	3.46		
Commercial		2.43	2.58	2.65	2.79	2.89		
Industrial		2.23	2.36	2.43	2.56	2.65		
Rural Water Districts	2.11	2.25	2.41	2.47	2.63	2.72		
Meter Size - Inches								
5/8 and 3/4	9.20	2.10	2.15	2.25	2.35	2.40		
1	10.10	2.55	2.60	2.70	2.80	2.90		
1 1/2	11.10	3.00	3.10	3.20	3.30	3.40		
2	16.90	4.30	4.30	4.50	4.60	4.80		
3	48.00	13.50	13.50	14.00	14.50	15.00		
4	59.00	17.00	17.00	17.50	18.00	18.50		
6	89.00	25.00	25.00	26.00	27.00	27.00		
8	115.00	34.00	34.00	36.00	36.00	37.00		
10	147.00	44.00	45.00	46.00	47.00	48.00		
12	166.00	52.00	53.00	55.00	56.00	57.00		

(a) First block is set at 20,000 gallons in 2007; 15,000 gallons in 2008; and 10,000 gallons in 2009 and subsequent years.

19-312(2) Multiple Living Units Customers served by a single meter shall be charged for water and sewer service according to the number of units served by the single meter, i.e., total usage will be divided by the number of living units served by the single meter to determine the charge per living unit, with the charge per living unit multiplied by the total number of living units served by the single meter to determine total charge. (Ord. 5701)

Table 17Water UtilityComparison of Revenue Under ProposedRates with Allocated Cost of ServiceTest Year 2005

		Revenue		Revenue As
		Under	Adjusted	A Percent
Line		Proposed	Cost of	of Cost of
No.		Rates	Service	Service
		\$	\$	
	Inside City			
1	Residential	7,103,300	7,099,600	100.1%
2	Non-Residential	2,448,400	2,451,200	99.9%
3	Total Inside City	9,551,700	9,550,800	100.0%
	Outside City			
4	Residential	19,200	19,200	100.0%
5	Non-Residential	449,200	449,600	99.9%
6	Subtotal Outside City	468,400	468,800	99.9%
7	Rural Water Districts	1,138,500	1,140,300	99.8%
8	Total Outside City	1,606,900	1,609,100	99.9%
9	Total Water Utility	11,158,600	11,159,900	100.0%

Wastewater Utility Revenue and Revenue Requirements

Customers and Sales

Growth in the wastewater system is expected to parallel growth of the water system. Contributed wastewater volume from inside City customers are projected to increase from about 2,550,000 Mg in 2004 to about 2,780,900 Mg by 2009. Contributed wastewater volume from outside City customers is projected to remain at 3,500 Mg throughout the five-year study period.

Tables covering the wastewater utility operations are shown at the end of this section, beginning on Page 64.

Wastewater Revenues

The wastewater utility revenues are derived from wastewater user charges, other operating income, system development charge revenue, interest income, and other non-operating revenue. Other income includes various sources of miscellaneous revenue such as a share of the revenue derived from taps, turn-on fees and interest from late payments. It also includes revenue derived from sewer inspections. Interest income is received from the investment of temporary fund balances. System development charge revenue recovers increased capacity costs imposed on the system by new customers. The development of this fee is discussed in more detail in the System Development Charge section of this report. Other non-operating revenue represents a share of income derived from the lease of property. Historical and projected revenues under existing rates and charges from wastewater utility operations are shown in Table 18.

Revenue Requirements

Revenue requirements of the wastewater utility consist of operation and maintenance expenses, debt service charges, routine capital improvements, and allowances for increased operating reserve.

Operation and Maintenance Expenses

Operation and maintenance expenses are incurred in the collection, pumping, and treatment of wastewater, and in the management of the utility. Operation and maintenance expense consists of labor, materials, chemicals, power, and other expenses. Table 19 summarizes historical and projected future operation and maintenance expenses of the wastewater utility. Future operation and maintenance expenses are based on an average of

93.5 percent of 2004 budgeted expenditures adjusted for inflation, anticipated system growth, and future staffing and additional operating requirements. The use of the 93.5 percent adjustment factor reduces the potential for budgeted contingency allowances to influence cost of service allocations and potentially overstate projected wastewater rates. Additional operation and maintenance costs not included in the 2004 budget but included in projected expenses includes the addition of a half-time staff engineer, one new crew position, and an additional laboratory technician to be shared with the water utility all beginning in 2005, an additional crew position beginning in 2007, and additional power costs associated with planned wastewater treatment plant improvements and a new pump station beginning in 2007 and 2008, respectively.

Routine Capital Additions

Routine annual capital improvement expenditures include those costs that are usually incurred each year for normal replacements, and minor improvements and extensions. These costs are typically payable from operating funds. The following table shows the projected wastewater utility routine annual capital requirements, including the estimated cost of minor replacements and improvements to treatment plant and other wastewater utility facilities and equipment. Projections of future expenditures are based on an analysis of historical experience and trends, and City budget projections, with allowances for future of inflation.

Projected Routine Capital Additions

Year	<u>Amount</u>
	\$
2005	390,300
2006	398,300
2007	414,800
2008	427,100
2009	440,000

Since the cost of these improvements is a continuing expense to be met each year, it is considered reasonable utility practice that such expenditures be financed on an annual basis from wastewater service charge revenue. Such a practice is reflected in evaluating the total revenue requirements in this report.

Major Capital Improvements

A summary of proposed wastewater utility capital improvements for 2004 to 2009 is shown in Table 20. The estimated cost of these improvements, assuming allowances for inflation, is \$105,678,000. Future regulatory requirements may require the addition of certain facilities not currently anticipated in the proposed capital improvement program. If additional facilities are required, increased wastewater service charges, additional debt financing or a combination of the two funding sources may be necessary.

The cost of the improvements is expected to be financed from funds presently on hand, future revenue bond proceeds, annual revenues, and interest earned on construction funds. Projected financing of the major capital improvements is shown in Table 21.

Debt Service Costs

Debt service costs attributed to the wastewater utility's share of the outstanding revenue bond issues and existing SRF loans are shown in Table 22. Estimated debt service on the proposed revenue bonds is also shown in this table. Estimated debt service payments on all future revenue bonds assume equal annual principal and interest payments over a period of 20 years and an annual interest rate of 5.5 percent. Revenue bonds are assumed to be issued on June 1 of the years 2005, 2007, and 2009.

Summary of Revenue Requirements

A pro forma statement of income and expenses for the wastewater utility is shown in Table 23. This statement includes projected revenues, operation and maintenance expense, debt service payments, routine capital additions, allowance for maintaining the required operating reserve balance, and cash financing of major capital improvements. The annual operating reserve requirement is equal to three months of the ensuing year's increase in operation and maintenance expense.

The summary of projected wastewater utility revenues and revenue requirements indicates that existing wastewater user charges will not produce sufficient revenues to meet the financial needs of the wastewater utility for the 2005 through 2009 study period.

Adjustments in revenues from wastewater user charges are recommended beginning in 2005 to offset the effects of inflation and to finance the major capital improvement program. Annual adjustments of 9 percent per year for each year of the study period are indicated if projected conditions materialize. Higher or lower rates of inflation, additional regulatory requirements, growth, or changes in construction amounts may necessitate modifications in the recommended wastewater rate adjustments.

Cost of Service Allocations

The development of an equitable wastewater charge structure is based upon the allocation of revenue requirements, or cost of service, to the various customer classes according to the nature and amount of the service rendered. Allocation of these requirements should consider the quantity and strength of wastewater contributed, peak rates of flow, and the number and relative size of customers.

Cost of Service to be Allocated

The cost of service to be allocated to the various customer classes consists of the total revenue requirements less income received from other sources. For allocation purposes this cost of service is expressed as an annual requirement for a specific test year. For purposes of this study, the calendar year ending December 31, 2005, has been selected as generally typical of conditions anticipated during the period in which the increased rates are expected to be in effect.

The 2005 cost of service to be recovered by wastewater charges is equal to \$12,952,500 with net operating expense totaling \$5,849,100 and capital costs totaling \$7,103,400. These net costs are derived from Table 23 and summarized on Line 14 of Table 24.

In allocating costs of service to customer classes, net revenue requirements are apportioned among the classes on a utility basis, that is, in terms of operating expense, depreciation expense, and return on investment. For a municipal utility, the total of depreciation expense and return on investment is equal to the total capital costs to be recovered from wastewater charges.

Depreciation is the loss, not restored by current maintenance, which occurs in the plant due to decay, inadequacy, and obsolescence. Depreciation accounting is usually based on an annual percentage allowance of plant investment equal to the original investment cost spread over the useful life of the facility. The annual depreciation allowance is not customarily accrued as a cash reserve, but is reinvested in the system through principal payments for long-term debt issued to construct system improvements, or cash financing of system improvements, replacements, and additions. Unless an amount at least equal to annual depreciation expense is reinvested in the system or is accrued for future investment, the original investment is gradually depleted.

For purposes of determining depreciation expense on plant in service during the test year, depreciation rates used by the wastewater utility on various categories of plant investment are also used in this study. The average annual test year depreciation expense is estimated to total \$2,053,700.

In a publicly owned utility, such as the Lawrence wastewater system, return on investment is the balance of the total annual revenue requirements for capital related costs, over and above the allowance for depreciation. Deduction of the estimated test year depreciation expense from the total capital cost requirement to be met from wastewater charges leaves \$5,049,700 to be recovered from customers as return on investment in the system's plant in service. The test year cost of service, expressed on a utility basis, is summarized on Lines 15 through 18 of Table 24.

Distribution of Costs to Functional Cost Components

Total costs of service are assigned to the basic functional cost components of volume, capacity, strength, and customer related costs.

Volume costs are those which vary directly with the quantity of wastewater contributed and include capital costs related to investment in system facilities sized on the basis of wastewater volume, and operation and maintenance expense related to those facilities. Capacity costs are related to facilities which are designed to handle the peak rates of wastewater flow.

Wastewater strength costs consist of the operation and maintenance expense and capital costs related to system facilities which are designed principally on the basis of the quantity of pollutants in the wastewater. Strength costs are further separated into biochemical oxygen demand (BOD) and suspended solids related costs. Customer costs are those which tend to vary in proportion to the number of customers served.

Separation of costs of service into these principal components provides the means for further allocation of such costs to the various customer classes on the basis of their respective volume and other service requirements.

Allocation of Plant Investment and Annual Depreciation

The investment in wastewater system facilities is allocated to appropriate cost components to determine the investment, or rate base, for which the various customer classes are responsible. The estimated test year 2005 net plant investment in wastewater facilities consists of plant in service as of December 31, 2003, the 2003 construction work in progress, and the estimated cost of proposed capital improvements expected to be in service by the end of calendar year 2005. Table 25 shows the allocation of the wastewater utility's total estimated plant value less contributions or net plant investment for the test year on an original cost less depreciation value basis. Total plant investment is estimated to be \$80,929,700 as indicated by Line 18 of the table.

Each item of plant investment is allocated to a functional cost component, or components, primarily in accordance with the function that determines the amount of

investment. For example, the investment in the collection system, consisting of mains and pumping stations, is related to maximum rates of wastewater flow and is therefore allocated to the capacity cost component. Wastewater treatment plant facilities such as plant influent and effluent pumping, excess flow storage, and preliminary treatment are also designed to meet maximum rates of flow and are assigned to the capacity component. Sedimentation and disinfection facilities are assigned to the volume component. Aeration facilities are commonly allocated to the BOD component to reflect the primary cost causative factor influencing their design. However, for purposes of this study, investment in aeration basins is allocated to the volume cost component to recognize sizing the basins for detention time required for BOD reduction. All remaining aeration facility costs for blower facilities and equipment are allocated to the BOD component. Sludge treatment facilities are assumed to be equally related to BOD and suspended solids quantities, and are assigned accordingly. General plant facilities such as site improvements, administrative facilities, and other items of a general nature are allocated to cost components on the basis of the allocation of all other plant components.

Depreciation expense is an allowance for loss in the service value of system facilities not restored by current maintenance due to a number of factors which result in the ultimate retirement of the property. The depreciation expense is based upon the total investment in facilities and would provide for the eventual recovery of the original cost of construction of the wastewater system over its service life. Depreciation on system facilities is allocated to functional cost components on the same basis used to allocate net plant investment. The allocation of test year depreciation is shown in Table 26.

Allocation of Operation and Maintenance Expense

Projected test year net operating expense for the collection system and treatment plant is allocated to functional cost components in generally the same manner as plant investment. The allocation of operation and maintenance expense to functional cost components is shown in Table 27. Expenses related to customer billing and collection are assigned directly to the meter reading and billing component. Administrative and General costs (Line 10) are assigned on the basis of all other operation and maintenance expenses less power and chemical costs. The annual operating reserve requirement (Line 13), other revenue (Line 14), and interest income (Line 15) are allocated in proportion to total operation and maintenance expense (Line 12). The total net operation and maintenance expense to be recovered from wastewater charges is shown on Line 16 of Table 27.

Distribution of Costs to Customer Classes

The total cost responsibility of each class of customers may be established by the distribution of the functionally allocated total cost of service for the utility among the classes based on the respective service requirements of each class.

Customer Classifications

Wastewater utility customers have been separated into seven principal categories including Residential, Multifamily, Commercial, Industrial, Kansas University, and Surcharge. These classifications are generally applicable for customers both inside and outside the City, and generally group together customers with similar service requirement characteristics.

Units of Service

The determination of responsibility of customer classes for costs of service requires that each class be allocated a portion of volume, capacity, strength and customer related costs of service according to their respective service requirements. Estimated units of service for the various customer classifications are shown in Table 28.

Wastewater volumes consist of two elements: (1) contributed sanitary flow and (2) infiltration/inflow (I/I) of ground and surface water into the sewers. Contributed sanitary flow is that portion of the annual water use or other discharge of each customer class which enters the sanitary sewer system. Estimates of the contributed volume of each class are based upon water billing records.

It is estimated that the test year amount of flow entering the sewers through I/I will average approximately 20 percent of total treated volume. Each customer class should bear its proportionate share of the costs associated with I/I as the sanitary sewer system must be adequate to convey the total wastewater flow. I/I is allocated to customers classes on the basis that two-thirds of the total is related to the number of customers in each class, with the remaining one-third allocated on the basis of the contributed sanitary volume of each class.

Capacity requirements are predicated on estimated contributed wastewater and I/I rate of flow. The capacity units include a peak rate of contributed flow of 1.25 times the average, and a peak rate of I/I of 4.0 times the average.

Estimated total strength units are based on treatment plant records which indicate the average wastewater BOD and suspended solids influent strengths for 2003 were 218 mg/l and 225 mg/l, respectively. I/I is estimated to have BOD and suspended solids concentrations of 25 mg/l and 50 mg/l, respectively. After allowance for I/I and the estimated extra strength units from industrial customers subject to surcharge, average

sanitary wastewater strength is estimated at 200 mg/l for BOD and 195 mg/l for suspended solids.

Customer Class Costs of Service

The costs of service are distributed to the various customer classes by application of unit costs of service to respective service requirements. The test year unit cost of service for each functional cost component is shown at the bottom of Table 29. Differences between inside and outside city customers are attributed to the relative rate of return recovered from each service area.

The rate of return applicable for service to customers should reflect, in part, consideration of the City's ownership of facilities, and both the imbedded and current cost of money on equity and debt capital. On the basis of these considerations, a weighted average rate of return equal to 8.5 percent is considered appropriate at this time for the provision of wastewater service to outside City customers. Unit costs for return on investment applicable to inside City customers are based on the resulting inside City rate of return applied to the unit plant investment. All customers, regardless of location, pay the unit costs developed for operating expense (Line 5) and depreciation expense (Line 7). Adding these unit costs to the respective unit costs for return on investment (Lines 10 and 11) determines the total unit costs of service shown on Lines 14 and 15 of Table 29. Unit costs for the two wastewater strength components (BOD and suspended solids) are also equal to the proposed surcharge rates applicable to customers discharging wastewater with BOD or suspended solids strength above 300 mg/l.

The total unit cost of service determined in Table 29, applied to the respective service requirements for each customer class, results in the total allocated cost of service for each customer class as shown in Table 30.

Comparison of the cost of service for each customer class with revenue under existing rates, and the indicated percentage adjustment in the level of revenue from each class required to meet those costs, is shown in Table 31. As indicated by this table, a wastewater revenue increase of 9 percent is required for calendar year 2005.

Wastewater Service Charge Adjustments

The principal consideration in establishing wastewater rate schedules is to establish charges to customers reasonably commensurate with the cost of providing wastewater service. Theoretically, the only method of assessing entirely equitable charges for wastewater service would be the determination of each customer's bill based on his particular requirements for service. Since this is impractical, schedules of rates are normally designed to meet average conditions for groups of customers having similar service requirements. Practicality also requires that rates be reasonably simple in application and subject to as few misinterpretations as possible.

The costs of service allocations offer a guide to the necessity for and the extent of service charge adjustments, and certain minimum criteria are required to be met as a condition of accepting federal assistance in capital expenditure programs. However, consideration must also be given to such factors as the extent of adjustments and City policies regarding wastewater service charges.

Existing Wastewater Rates

The existing schedule of rates for wastewater service have been in effect since January 1, 2004. These rates include a minimum bill, which varies by meter size, and a uniform volume charge. The minimum bill includes a volume allowance of 2 Mg per month. Separate minimum bill and volume charges apply to inside and outside City customers. Inside City minimum charges range from \$14.60 for a 5/8-inch meter to \$51.00 for a 12-inch meter. Inside City volume charges for billable wastewater volume over 2 Mg per month is \$3.03. Excess wastewater strength charges are also applied for customers whose wastewater strength exceeds 300 mg/l for BOD and suspended solids.

Residential volume charges for the months of March through November are based on the average monthly water use during the preceding winter months of December through February. This recognizes that during the low use winter months, the water usage of these customers is principally for domestic and sanitary uses tributary to the sanitary sewers, whereas most of the additional levels of water usage in the other warmer months of the year are typically for lawn watering, car washing, and other purposes which do not contribute to the flow in the sanitary sewers.

Charges to Commercial and Industrial customers are based on total metered water use, with the provision that if a customer can show that a significant portion of the metered water use regularly does not enter the sanitary sewers, the customer will be charged for only that volume entering the sewers.

Under current practice, wastewater charges for apartments are computed by dividing

the total metered water use by the number of dwelling units and computing charges as if each were a separate customer served by a 5/8-inch water meter. This procedure does not provide for the recovery of costs strictly in accordance with cost of service principles.

Proposed Wastewater Charges

Proposed charges for wastewater service are based on the premise that the wastewater utility should be financially self-sufficient, so that the revenue from wastewater charges will be adequate to provide for total annual revenue requirements of the wastewater system.

The proposed wastewater rates, shown in Table 32, continues the form of the existing rate schedule. However, the minimum bill per meter size has been replaced by a uniform service charge for all meter sizes. This uniform charge is available due to technological improvements in the City's meter reading capabilities that no longer justify increased billing charges to the commercial and industrial customers.

The proposed service charge is designed to recover all customer costs associated with billing and collecting and those costs associated with I/I which are allocated on the basis of the number of customers served.

A comparison of allocated costs of service for the test year with wastewater revenue under the proposed rates is shown in Table 33. As indicated, revenues under the proposed rates will adequately recover the total cost of service, and reasonably recover the allocated cost of service from each customer class.

Waste Hauler Charges

The City of Lawrence has the capability to provide regional wastewater treatment services to a portion of County residents that discharge wastewater to privately owned septic tanks and commercial operations that require treatment services for chemical toilet wastes. To provide this service, the City has constructed a secured waste hauler receiving station at its treatment facility. Wastewater charges for this service can range from the minimum recovery of only the operation, maintenance, and replacement (OM&R) costs that are required by federal user charge requirements to full cost recovery of all costs required to serve these customers.

The cost to construct the new receiving station was approximately \$254,000. Capital costs for this facility can be recovered under the utility basis of rate design, similar to the wastewater charges developed for outside City water and wastewater customers. Under this methodology, the City is entitled to earn a fair rate of return on the investment in facilities required to serve a non-owner customer group as well as an annual depreciation expense. Assuming an 8.5 percent rate of return, the annual return on investment for the waste hauler receiving facility would be about \$21,600. The City typically depreciates wastewater

treatment related structures over a 50-year period. Therefore, the annual depreciation expense related to this facility would be about \$5,100 per year and the total capital related costs would be about \$26,700 per year.

If capital costs are recovered by the City, these costs could be recovered based upon the actual annual use of the facility or the capacity of the facility. It is estimated that the facility receives an average of 6 truckloads per month with an average load of about 750 gallons. At this rate, the annual volume discharged to the receiving facility would be about 54 Mg per year and the total capital recovery charge on a volume basis would be about \$494/Mg. If only annual depreciation of the facility is recovered, a volume charge of about \$494/Mg would be required for the estimated annual use of the facility. Using the estimated throughput capacity of 50 loads per month, the resulting design capacity is 450 Mg per year and the associated capital recovery volume charge required is \$59.33/Mg of which \$11.33/Mg is related to annual depreciation. It is deemed more appropriate to base waste hauler charges only on their proportionate use of the system and receiving facility. Therefore, the capital recover portion of the waste hauler charge is proposed to be based on the capacity of the receiving facility.

Another cost incurred to serve these customers is the sampling and laboratory cost required to determine the wastewater strength discharged. The City estimates that this cost is about \$90 for septic tank wastes and about \$110 for chemical toilet wastes. To insure compliance and develop average wastewater strengths for billing purposes, sampling is conducted on the average of every fifth load. The average cost for this sampling frequency reduces the cost to be recovered to about \$18/load or \$24.00/Mg for septic tank wastes and about \$22/load or \$29.33/Mg for chemical wastes.

Treatment costs to be recovered include costs related to the flow and wastewater strength of the waste discharged. The table below summarizes the expected wastewater strengths related to septic tank and chemical toilet wastes.

Wastewater Strength – mg/l

	Chemical Wastes	Septic Tank Waste
COD	39,700	54,800
BOD (a)	23,000	31,800
Total Solids	37,700	38,000

(a) BOD strength is estimated to be about 58 percent of COD strength.

Unit costs applicable to hauled wastes do not include any costs for wastewater

collection by the sewer system, costs related to billing sewer service customers, or costs related to infiltration/inflow. A summary of unit costs of treatment is presented in the table below.

Wastewater Treatment Unit Costs

Parameter	<u>O&M</u>	Depreciation	Return	Total
Volume - \$/Mg	0.56900	0.24452	1.02467	1.83819
Wastewater Strength				
BOD - \$/pound	0.17254	0.05220	0.22659	0.45133
TS - \$/pound	0.08404	0.04025	0.17475	0.29905

These unit costs are comparable to those developed in Table 29, with the exception that the volume unit costs shown above are a composite of the volume and capacity unit costs shown in Table 29.

Treatment charges that reflect the wastewater strength characteristics of the two hauled wastes can be developed by applying the applicable strength related unit costs to the respective average wastewater strengths. The table below shows the two major components of the treatment charge for each type of waste. These components consist of OM&R and capital related charges. The OM&R charge includes unit cost developed for treatment related operation and maintenance as well as depreciation expenses. The capital charge is equal to the return on investment related to treatment facilities.

Waste Hauler Related Treatment Charges - \$/Mg

	Chemical Wastes	Septic Tank Wastes
OM&R Charge (a)	83.05	99.87
Capital Charge	99.49	116.57
Total (b)	182.54	216.44

(a) Includes depreciation expense on treatment related facilities.

(b) Charge in addition to the charges for capital cost recovery of the receiving facility and laboratory costs.

Total charges applicable to waste haulers can vary based on City policy considerations. This variation depends on the level of capital costs recovered through the applicable user charges. The federal user charge regulations require that all publicly owned wastewater utilities that have accepted Clean Water Program grant monies recover all OM&R costs in proportion to the service requirements of each customer class. Therefore, as a minimum, the OM&R portion of total charges must be applied to all wastes discharged to the receiving facility. The table below indicates the range that could apply to these charges.

	Minin	num Charge	Total Charge	
	Chemical <u>Wastes</u>	Septic <u>Tank Wastes</u>	Chemical <u>Wastes</u>	Septic Tank Wastes
Service Charge - \$/Mg				
Receiving Facility	11.33	11.33	59.33	59.33
Sampling Services	29.33	24.00	<u>29.33</u>	24.00
Total	40.66	35.33	88.66	83.33
Treatment Charge - \$/Mg				
OM&R	83.05	99.87	83.05	99.87
Capital	0.00	0.00	99.49	116.57
Total	83.05	99.87	182.54	216.44
Combined Total - \$/Mg	123.71	135.20	271.20	299.77
Proposed Total Charge - \$/M	171.71	183.20		

Range of Potential Waste Hauler Charges

(a) Excludes treatment related capital charges.

The indicated minimum charges in the above table assumes that the City will only recover the applicable share of annual depreciation associated with the waste hauler receiving facility, sampling will be provided on the average of every fifth load discharged, and the City will not charge any capital costs, other than depreciation, related to the treatment plant. The indicated total charge assumes that the City will recover a proportionate share of all capital costs directly from the users of the receiving facility, sampling will also be provided on the average of every fifth load discharged, and both OM&R and capital related treatment costs will be fully recovered. Charges under each case do not include the collection and transportation of the wastes to the treatment facility by the waste hauler. The current \$119.51/Mg charge for chemical waste is less than the indicated minimum charge and the current \$137.41/Mg charge for septage discharged is slightly above the indicated

minimum charge. Neither of the two existing charges fully recovers a proportionate share of the capital costs related to the receiving facility. Therefore, it is proposed that the City increase the current waste hauler rates to equal or approach those indicated by the proposed charges, which recover the capital charges related to the receiving facility. Such proposed charges exclude capital costs related to the treatment facilities to provide more competitive rates and promote the use of the receiving facility.

The amount of time before a septic tank requires cleaning can vary but a typical septic tank can be used continuously for a period of about 3-years before cleaning is required. If this "typical septic tank customer" was connected to the City's wastewater collection system and discharged an average of 4,000 gallons per month, he would pay about \$961 in outside city wastewater charges during the same 3-year period, assuming no changes in either the proposed calendar year 2005 wastewater or septage charges. If the typical septic tank users pay a hauler \$150 for pick-up and transportation services, the combined treatment and transportation charge of about \$450 would be less than half the total charges paid by an outside City user connected to the City's wastewater collection system. Therefore, the waste haulers and ultimately the septic tank and chemical toilet customers in Douglas County could reasonably be charged the full cost of providing wastewater treatment services.

Table 18 Wastewater Utility Historical and Projected Revenue Under Existing Rates

		System							
	Other	Development		Other Non-					
Wastewater	Operating	Charge	Interest	Operating	Total				
Revenue (a)	Revenue	Revenue	Income (b)	Revenue	Revenue				
\$	\$	\$	\$	\$	\$				
Historical									
8,250,371	426,576	371,772	725,883	7,150	9,781,753				
8,794,647	429,675	415,387	1,009,564	7,600	10,656,873				
9,464,968	433,060	417,162	864,867	10,969	11,191,026				
10,129,844	410,949	387,519	542,703	22,450	11,493,465				
10,775,338	447,374	516,558	400,466	16,275	12,156,011				
Projected									
11,654,000	430,000	400,000	140,200	13,000	12,637,200				
11,883,000	430,000	400,000	200,100	13,000	12,926,100				
12,112,200	430,000	400,000	208,900	13,000	13,164,100				
12,341,200	430,000	400,000	524,700	13,000	13,708,900				
12,570,300	430,000	400,000	711,300	13,000	14,124,600				
12,798,800	430,000	400,000	813,800	13,000	14,455,600				
	Wastewater Revenue (a) \$ 8,250,371 8,794,647 9,464,968 10,129,844 10,775,338 11,654,000 11,883,000 12,112,200 12,341,200 12,570,300 12,798,800	$\begin{array}{c} \begin{array}{c} \text{Wastewater} \\ \hline \text{Revenue (a)} \\ \hline \end{array} \\ \hline \\ \begin{array}{c} \text{S} \\ \end{array} \\ \hline \\ \begin{array}{c} 8,250,371 \\ 8,250,371 \\ 8,794,647 \\ 9,464,968 \\ 10,129,844 \\ 10,775,338 \\ \end{array} \\ \begin{array}{c} 426,576 \\ 429,675 \\ 9,464,968 \\ 433,060 \\ 10,129,844 \\ 410,949 \\ 10,775,338 \\ \end{array} \\ \begin{array}{c} 447,374 \\ \end{array} \\ \begin{array}{c} 11,654,000 \\ 11,883,000 \\ 12,112,200 \\ 12,341,200 \\ 12,570,300 \\ 12,798,800 \\ \end{array} \\ \begin{array}{c} \text{Other} \\ \text{Operating} \\ \text{Revenue} \\ \hline \\ \text{New particular} \\ \end{array} \\ \begin{array}{c} \text{Other} \\ \text{Operating} \\ \text{Revenue} \\ \hline \\ \text{New particular} \\ \end{array} \\ \begin{array}{c} \text{Wastewater} \\ \text{Weights} \\ \begin{array}{c} \text{Wastewater} \\ \text{Wastewater} \\ \begin{array}{c} \text{Wastewater} \\ \begin{array}{c} \text{Wastewater} \\ \text{Wastewater} \\ \end{array} \\ \begin{array}{c} \text{Wastewater} \\ \begin{array}{c} \text{Wastewater} \\ \end{array} \\ \end{array} \\ \end{array} \end{array} \\ \end{array} \\ \end{array}$	System Wastewater Operating Development Revenue (a) Revenue Revenue Revenue \$ \$ \$ \$ \$ Historica \$ \$ \$ \$ \$,250,371 426,576 371,772 \$ \$ 8,250,371 426,576 371,772 \$ \$ 8,794,647 429,675 415,387 \$ \$ 9,464,968 433,060 417,162 \$ \$ 10,129,844 410,949 387,519 \$ \$ 10,775,338 447,374 \$ \$ \$ Projected \$ \$ \$ \$ 11,654,000 430,000 400,000 \$ \$ \$ 12,341,200 430,000 400,000 \$ \$ \$ 12,570,300 430,000 400,000 \$ \$ \$ 12,798,800 430,000 400,000 \$ \$ \$ <	$\begin{array}{c ccccc} System \\ Other & Development \\ \hline \\ Wastewater & Operating \\ \hline \\ Revenue (a) \\ \hline \\ $	SystemOther Mastewater $$OtherOperatingRevenue$DevelopmentChargeRevenue$Other Non-OperatingRevenue$Wastewater$OperatingRevenue$RevenueIncome (b)RevenueRevenue$$Historical8,250,3718,794,6479,46479,464,96810,129,84410,129,84410,949371,772410,949387,519387,519316,558400,4667,60040,96922,45016,275Projected11,654,00011,883,000430,000430,000400,00012,112,200430,00012,341,200430,000430,000430,000400,000400,000400,000200,10013,00012,341,200430,000430,000400,000400,000400,000524,70013,00013,00012,570,300430,000430,000400,000400,000400,000313,00012,798,80039,000430,000400,000400,000400,000400,000313,000$				

 Projected wastewater sales revenue based on rates in effect January 1, 2004. Includes excess strength surcharge revenue.

(b) Includes interest earned on construction funds.
Table 19
Wastewater Utility
Historical and Projected
Operation and Maintenance Expense

			Customers							
			Meters &	Admin. &						
	Collection	Treatment	Billing	General						
Year	Expense	Expense	Expense	Expense	Total					
	\$	\$	\$	\$	\$					
Historical										
1999	949,769	1,668,685	513,324	493,150	3,624,928					
2000	999,653	1,787,793	508,831	485,242	3,781,519					
2001	1,174,062	1,822,779	547,564	597,514	4,141,918					
2002	1,439,929	2,112,985	637,876	611,415	4,802,205					
2003	1,461,081	2,315,588	672,252	656,853	5,105,774					
		Proje	ected							
2004	1,910,700	2,765,600	723,400	708,200	6,107,900					
2005	2,034,700	2,939,100	755,200	735,800	6,464,800					
2006	2,119,400	3,067,500	788,400	749,300	6,724,600					
2007	2,252,800	3,251,700	823,200	805,600	7,133,300					
2008	2,372,300	3,393,900	859,400	841,300	7,466,900					
2009	2,472,000	3,541,900	897,400	878,600	7,789,900					

Historical and Projected Operation & Maintenance Expense



Table 20Wastewater UtilityMajor Capital Improvement Program

Line								
No.	Description	2004	2005	2006	2007	2008	2009	Total
		\$	\$	\$	\$	\$	\$	\$
	Collection System							
1	Pipe Project - Central Basin (c)	820,000	0	0	0	0	0	820,000
2	Pipe Project - East Lawrence Basin (c)	369,000	0	0	0	0	0	369,000
3	Pipe Project - Kansas River Basin (c)	652,000	91,000	94,000	0	0	0	837,000
4	Pipe Project - Wakarusa River Basin (c)	939,000	2,698,000	1,675,000	0	0	0	5,312,000
5	Pipe Project - Yankee Tank Creek Basin (c)	0	0	0	0	0	1,685,000	1,685,000
6	Pump Station Project - Wakarusa River Basin (c)	260,000	0	225,000	0	0	0	485,000
7	Pump Station Project - Kansas River Basin (c)	260,000	0	941,000	1,960,000	0	695,000	3,856,000
8	Force Main Project - Kansas River Basin (c)	0	0	788,000	0	0	0	788,000
	Treatment System							
	Kansas River WWTP							
9	Add Roof to Dewatering Biosolids Storage Basin (c)	437,000	0	0	0	0	0	437,000
10	Vehicle & Equipment Storage Building (c)	0	487,000	0	0	0	0	487,000
11	Anaerobic Digester Improvements (a)	0	0	2,700,000	0	0	0	2,700,000
	Wakarusa River WWTP							
12	Acquire WWTP Site (a)	520,000	541,000	563,000	0	0	0	1,624,000
13	6.9 mgd WWTP w/BNR & Solids Processing (a)	0	0	0	5,499,000	5,719,000	54,536,000	65,754,000
14	WWTP Excess Flow Handling Facility (a)	0	0	0	0	1,095,000	5,315,000	6,410,000
15	Second Electrical Power Feed to WWTP (a)	0	0	0	0	110,000	519,000	629,000
16	Flood Projection & WWTP Site Fill (a)	0	0	0	0	329,000	1,557,000	1,886,000
	Other							
17	I/I Removal (c)	676,000	704,000	732,000	761,000	791,000	823,000	4,487,000
18	CMOM (Capacity, Management, Operations, & Maintenance) (b)	208,000	0	0	0	0	0	208,000
19	General Sanitary Sewer Improvements (c)	624,000	649,000	675,000	702,000	730,000	760,000	4,140,000
20	General Pumping Station Improvements (c)	208,000	217,000	225,000	234,000	244,000	254,000	1,382,000
21	General WWTP Improvements (c)	208,000	217,000	225,000	234,000	244,000	254,000	1,382,000
22	Total Wastewater	6,181,000	5,604,000	8,843,000	9,390,000	9,262,000	66,398,000	105,678,000

(b) Project required by EPA and KDHE regulations.

(c) Project required to improve system reliability or transmission capacity.

Table 21Wastewater UtilityMajor Capital Improvement Program Financing

Line								
No.		2004	2005	2006	2007	2008	2009	Total
		\$	\$	\$	\$	\$	\$	\$
	Source of Funds							
1	Beginning of Year Balance	3,450,400	1,318,000	9,527,900	3,213,700	33,479,600	26,826,400	3,450,400
2	Bond Proceeds	0	12,300,000	0	41,300,000	0	47,000,000	100,600,000
3	SRF Loan Proceeds	0	0	0	0	0	0	0
4	Cash Financing of Construction	4,000,000	2,600,000	2,400,000	2,000,000	2,000,000	2,000,000	15,000,000
5	Interest Income	48,600	127,700	128,800	431,400	608,800	707,700	2,053,000
6	Total Funds Available	7,499,000	16,345,700	12,056,700	46,945,100	36,088,400	76,534,100	121,103,400
	Application of Funds							
7	Major Capital Improvements	6,181,000	5,604,000	8,843,000	9,390,000	9,262,000	66,398,000	105,678,000
8	Bond Issuance Costs	0	184,500	0	619,500	0	705,000	1,509,000
9	SRF Loan Issuance Costs	0	0	0	0	0	0	0
10	Deposits to Bond Reserve Fund	0	1,029,300	0	3,456,000	0	3,932,900	8,418,200
11	Total Funds Applied	6,181,000	6,817,800	8,843,000	13,465,500	9,262,000	71,035,900	115,605,200
12	End of Year Fund Balance	1,318,000	9,527,900	3,213,700	33,479,600	26,826,400	5,498,200	5,498,200

Table 22Wastewater UtilityDebt Service on Outstanding and Proposed Bonds

Year	Existing Revenue Bonds \$	Proposed Revenue Bonds \$	Existing SRF Loan \$	Proposed SRF Loans	Total \$					
Deposits to Principal and Interest Account										
2004	1,035,400	0	3,206,700	0	4,242,100					
2005	1,039,400	600,400	3,206,700	0	4,846,500					
2006	1,042,200	1,029,300	3,206,700	0	5,278,200					
2007	1,046,300	3,045,300	3,206,700	0	7,298,300					
2008	1,045,800	4,485,300	3,206,700	0	8,737,800					
2009	1,051,200	6,779,500	3,206,700	0	11,037,400					
	Pa	ayments to l	Bondholder	5						
2004	1,034,700	0	3,206,700	0	4,241,400					
2005	1,039,000	338,300	3,206,700	0	4,584,000					
2006	1,041,300	1,029,300	3,206,700	0	5,277,300					
2007	1,046,700	2,165,100	3,206,700	0	6,418,500					
2008	1,044,800	4,485,300	3,206,700	0	8,736,800					
2009	1,050,700	5,777,800	3,206,700	0	10,035,200					



Historical & Projected Wastewater Debt Service Payments

Table 23Wastewater UtilityComparison of Projected Revenue Under IndicatedRevenue Adjustments With Projected Revenue Requirements

Line								
No.	Description			2005	2006	2007	2008	2009
				\$	\$	\$	\$	\$
1	Revenue Und Additional Re	er Existing Rate	es 1	11,883,000	12,112,200	12,341,200	12,570,300	12,798,800
		Revenue	Months					
	Year	Increase	Effective					
2	2005	9.0%	12	1,069,500	1,090,100	1,110,700	1,131,300	1,151,900
3	2006	9.0%	12		1,188,200	1,210,700	1,233,100	1,255,600
4	2007	9.0%	12			1,319,600	1,344,100	1,368,600
5	2008	9.0%	12				1,465,100	1,491,700
6	2009	9.0%	12					1,626,000
7	Subtotal			1,069,500	2,278,300	3,641,000	5,173,600	6,893,800
8	Total Service	Charge Revenu	le	12,952,500	14,390,500	15,982,200	17,743,900	19,692,600
9	Other Operat	ing Revenue		430,000	430,000	430,000	430,000	430,000
10	Other Non-O	perating Revenu	ie	13,000	13,000	13,000	13,000	13,000
11	System Development Charge Revenue		400,000	400,000	400,000	400,000	400,000	
12	Interest Income - Operations			72,400	80,100	93,300	102,500	106,100
13	Interest Income - Reserve Funds		338,400	358,400	432,300	501,300	587,000	
14	Total Revenu	e		14,206,300	15,672,000	17,350,800	19,190,700	21,228,700
15	Operation and	d Maintenance I	Expense	6,464,800	6,724,600	7,133,300	7,466,900	7,789,900
16	Net Revenue			7,741,500	8,947,400	10,217,500	11,723,800	13,438,800
	Debt Service	(a)						
17	Existing Re	venue Bonds		1,039,400	1,042,200	1,046,300	1,045,800	1,051,200
18	Proposed R	evenue Bonds		600,400	1,029,300	3,045,300	4,485,300	6,779,500
19	Total Revenu	e Bonds		1,639,800	2,071,500	4,091,600	5,531,100	7,830,700
20	Existing SR	F Loans		3,206,700	3,206,700	3,206,700	3,206,700	3,206,700
21	Proposed S	RF Loans		0	0	0	0	0
22	Total Debt Se	ervice		4,846,500	5,278,200	7,298,300	8,737,800	11,037,400
23	Routine Capi	tal Additions		390 300	398 300	414 800	427 100	440 000
24	Deposits to C	perating Reserv	ve	0	0	61.564	79.644	83.342
25	Cash Financii	ng of Constructi	on	2,600,000	2,400,000	2,000,000	2,000,000	2,000,000
26	Net Annual B	salance		(95,300)	870,900	442,836	479,256	(121,942)
27	Beginning of	Year Balance (a	a)	3,666,100	3,570,800	4,441,700	4,884,536	5,363,792
28	End of Year I	Balance (a)		3,570,800	4,441,700	4,884,536	5,363,792	5,241,849

(a) Excludes operating reserve and bond reserve.

Table 24 Wastewater Utility Cost of Service Test Year 2005

Line		Operating	Capital	
No.		Expense	Cost	Total
		\$	\$	\$
	Revenue Requirements			
1	Operation & Maintenance Expense	6,464,800		6,464,800
2	Debt Service Requirements		4,846,500	4,846,500
3	Routine Capital Additions		390,300	390,300
4	Operating Reserve	0		0
5	Cash Financing of Construction		2,600,000	2,600,000
6	Total	6,464,800	7,836,800	14,301,600
	Revenue Requirements Met fro	om Other Sou	rces	
7	Other Operating Revenue	430,000		430,000
8	Nonoperating Revenue		13,000	13,000
9	System Development Charge Revenue		400,000	400,000
10	Interest Income	185,700	225,100	410,800
11	Change in Funds Available		95,300	95,300
12	Full Year Rate Adjustment		0	0
13	Total	615,700	733,400	1,349,100
14	Net Costs to be Met from Charges	5,849,100	7,103,400	12,952,500
	Restatement of Net Costs (Util	ity Basis)		
15	Operation & Maintenance Expense	5,849,100		5,849,100
16	Depreciation Expense		2,053,700	2,053,700
17	Return on Investment		5,049,700	5,049,700

10	Depreciation Expense		2,035,700	2,035,700
17	Return on Investment		5,049,700	5,049,700
18	Total	5,849,100	7,103,400	12,952,500

Table 25Wastewater UtilityAllocation of Net Plant InvestmentTo Functional Cost ComponentsTest Year 2005

Line		Net Plant			Wastewater Strength		
No.	Description	Investment	Volume	Capacity	BOD	SS	
		\$	\$	\$	\$	\$	
1	Collection	20,033,400		20,033,400			
	Treatment						
2	Raw Wastewater Pumping	10,089,400		10,089,400			
3	Excess Flow Storage	543,300		543,300			
4	Preliminary Treatment	7,140,200		7,140,200			
5	Primary Sedimentation	4,423,800	4,423,800				
6	Aeration Basin Structure	5,820,800	5,820,800				
7	Aeration Equipment	3,570,100			3,570,100		
8	Secondary Sedimentation	5,510,300	5,510,300				
9	Recirculation Pumping	1,629,800	1,629,800				
10	Chlorination/Dechlorination	2,716,400		2,716,400			
11	Sludge Pumping	977,900				977,900	
12	Sludge Processing	15,926,000			7,963,000	7,963,000	
13	Subtotal Treatment	58,348,000	17,384,700	20,489,300	11,533,100	8,940,900	
14	General Plant	2,017,400	601,400	708,000	399,000	309,000	
15	Total Treatment	60,365,400	17,986,100	21,197,300	11,932,100	9,249,900	
16	Total System	80,398,800	17,986,100	41,230,700	11,932,100	9,249,900	
17	Administration & General	530,900	118,900	272,000	79,000	61,000	
18	Total	80,929,700	18,105,000	41,502,700	12,011,100	9,310,900	

Table 26Wastewater UtilityAllocation of Depreciation ExpenseTo Functional Cost ComponentsTest Year 2005

Line		Depreciation			Wastewater Strength		
No.	Description	Expense	Volume	Capacity	BOD	SS	
.		\$	\$	\$	\$	\$	
1	Collection	834,300		834,300			
	Treatment						
2	Raw Wastewater Pumping	192,100		192,100			
3	Excess Flow Storage	10,300		10,300			
4	Preliminary Treatment	135,900		135,900			
5	Primary Sedimentation	84,200	84,200				
6	Aeration Basin Structure	110,800	110,800				
7	Aeration Equipment	68,000			68,000		
8	Secondary Sedimentation	104,900	104,900				
9	Recirculation Pumping	31,000	31,000				
10	Chlorination/Dechlorination	51,700		51,700			
11	Sludge Pumping	18,600				18,600	
12	Sludge Processing	303,200			151,600	151,600	
13	Subtotal Treatment	1,110,700	330,900	390,000	219,600	170,200	
14	General Plant	38,600	11,500	13,600	7,600	5,900	
15	Total Treatment	1,149,300	342,400	403,600	227,200	176,100	
16	Total System	1,983,600	342,400	1,237,900	227,200	176,100	
17	Administration & General	70,100	12,200	43,700	8,000	6,200	
18	Total	2,053,700	354,600	1,281,600	235,200	182,300	

Table 27Wastewater UtilityAllocation of Operation & Maintenance Expenseto Functional Cost ComponentsTest Year 2005

		Total			Wastewate	r Strength	Meter Reading & Billing	
Line No.	Description	O&M Cost	Volume	Capacity	BOD	Suspended Solids		
		\$	\$	\$	\$	\$	\$	
	Collection System							
1	Power, Gas & Chem.	165,900		165,900				
2	All Other	1,868,800		1,868,800				
3	Subtotal	2,034,700		2,034,700				
	Treatment Plant							
4	Salaries	948,900	379,500	284,700	161,300	123,400		
5	Power, Gas & Chem.	695,500	173,800	173,900	347,800	0		
6	All Other	1,033,400	506,300	258,400	155,000	113,700		
7	Subtotal	2,677,800	1,059,600	717,000	664,100	237,100		
8	Billing & Collection	755,200					755,200	
9	Laboratory	261,300			130,700	130,600		
10	Admin & General	701,800	127,800	347,700	64,400	53,000	108,900	
11	Bad Debt Expense	34,000					34,000	
12	Total O&M Expense	6,464,800	1,187,400	3,099,400	859,200	420,700	898,100	
13	Operating Reserve	0	0	0	0	0	0	
14	Other Revenue	(430,000)	(79,000)	(206,200)	(57,100)	(28,000)	(59,700)	
15	Interest Income	(185,700)	(34,100)	(89,000)	(24,700)	(12,100)	(25,800)	
16	Net O&M Cost	5,849,100	1,074,300	2,804,200	777,400	380,600	812,600	

Table 28 Wastewater Utility Units of Service Test Year 2005

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Wastewater Volume				Capacity			Wastewater Strength	
Line No.		Contributed Volume	Infiltration /Inflow	Total	Contributed Volume	Infiltration /Inflow	Total	BOD	Suspended Solids	Customers
	-	Mg	Mg	Mg (1) + (2)	Mgd	Mgd	$\frac{\text{Mgd}}{(4) + (5)}$	Pounds	Pounds	Bills
	Inside City									
1	Residential	1,473,600	441,300	1,914,900	5,000	4,800	9,800	2,550,000	2,580,500	326,808
2	Multifamily	330,800	122,900	453,700	1,100	1,300	2,400	577,400	589,200	97,716
3	Commercial	536,300	63,000	599,300	1,800	700	2,500	907,700	898,400	19,128
4	Industrial	64,800	6,300	71,100	200	100	300	109,400	108,000	936
5	KU	190,700	16,100	206,800	700	200	900	321,400	316,800	360
6	Surcharge							33,800	30,000	
7	Total	2,596,200	649,600	3,245,800	8,800	7,100	15,900	4,499,700	4,522,900	444,948
	Outside City									
8	Residential	400	100	500	1	1	2	700	700	96
9	Multifamily	0	0	0	0	0	0	0	0	0
10	Commercial	100	100	200	0	1	1	200	200	48
11	Industrial	3,000	300	3,300	10	3	13	5,100	5,000	12
12	Total	3,500	500	4,000	11	5	16	6,000	5,900	156
13	Total System	2,599,700	650,100	3,249,800	8,811	7,105	15,916	4,505,700	4,528,800	445,104

Mg - Thousand gallons

Mgd - Thousand gallons per day

Table 29 Wastewater Utility Unit Costs of Service Test Year 2005

				Wastewate			
Line No.		Total	Volume	Capacity	BOD	Suspended Solids	Customer Billing
		\$	Mg	Mgd	Pounds	Pounds	Equivalent
	Units of Service						Bills
1	Inside City		3,245,800	15,900	4,499,700	4,522,900	444,948
2	Outside City		4,000	16	6,000	5,900	156
3	Total System		3,249,800	15,916	4,505,700	4,528,800	445,104
	Costs of Service						
	Net Operating Expense						
4	Total Cost - \$	5,849,100	1,074,300	2,804,200	777,400	380,600	812,600
5	Unit Cost - \$/unit		0.33057	176.18748	0.17254	0.08404	1.82564
	Depreciation Expense						
6	Total Cost - \$	2,053,700	354,600	1,281,600	235,200	182,300	
7	Unit Cost - \$/unit		0.10911	80.52274	0.05220	0.04025	
	Net Plant Investment						
8	Total Cost - \$	80,929,700	18,105,000	41,502,700	12,011,100	9,310,900	
9	Unit Cost - \$/unit		5.57111	2,607.6087	2.66576	2.05593	
	Return on Investment						
10	Unit Cost - 5/unit		0 2 4 7 4 7	162 62779	0 16626	0 12922	
10	Outside		0.34/4/	102.03778	0.10020	0.12823	
11	Total Cost		0.4/334	221.040/4	0.22039	0.1/4/3	
12	Inside City Cost - \$	5 041 900	1 120 100	2 585 900	748 100	580.000	
13	Outside City Cost - \$	7 800	1 900	3 500	1 400	1 000	
10	Total	5.040.700	1 122 000	2 580 400	740,500	591,000	0
	lotal	5,049,700	1,122,000	2,589,400	/49,500	581,000	0
	Total Unit Cost of Service						
14	Inside City - \$/unit		0.78716	419.35	0.39100	0.25252	1.82564
15	Outside City - \$/unit		0.91323	478.36	0.45133	0.29905	1.82564
	Total Cost of Service						
16	Inside City - \$	12,936,300	2,554,900	6,667,600	1,759,400	1,142,100	812,300
17	Outside City - \$	16,200	3,700	7,700	2,700	1,800	300
18	Total	12,952,500	2,558,600	6,675,300	1,762,100	1,143,900	812,600

Mg - Thousand gallons

Mgd - Thousand gallons per day

Table 30 Wastewater Utility Allocated Costs of Service to Customer Classes Test Year 2005

					Wastewat	er Strength	
Line No.		Total	Volume	Capacity	BOD	Suspended Solids	Customer Billing
		\$					
	Unit Costs of Serv	ice - \$/Unit					
1	Inside City		0.78716	419.35	0.39100	0.25252	1.82564
2	Outside City		0.91323	478.36	0.45133	0.29905	1.82564
	Allocation of Costs	s to Custom	er Classes				
	Inside City						
	Residential						
3	Units of Service		1,914,900	9,800	2,550,000	2,580,500	326,808
4	Allocated Cost - \$	7,862,000	1,507,300	4,109,600	997,000	651,500	596,600
	Multifamily						
5	Units of Service		453,700	2,400	577,400	589,200	97,716
6	Allocated Cost - \$	1,916,500	357,100	1,006,400	225,800	148,800	178,400
	Commercial						
7	Units of Service		599,300	2,500	907,700	898,400	19,128
8	Allocated Cost - \$	2,136,800	471,700	1,048,400	354,900	226,900	34,900
	Industrial						
9	Units of Service		71,100	300	109,400	108,000	936
10	Allocated Cost - \$	253,600	56,000	125,800	42,800	27,300	1,700
	Kansas University						
11	Units of Service		206,800	900	321,400	316,800	360
12	Allocated Cost - \$	746,600	162,800	377,400	125,700	80,000	700
	Surcharge						
13	Units of Service				33,800	30,000	
14	Allocated Cost - \$	20,800			13,200	7,600	
	Total Inside City	12,936,300	2,554,900	6,667,600	1,759,400	1,142,100	812,300
	Outside City						
	Residential						
15	Units of Service		500	2	700	700	96
16	Allocated Cost - \$	2,200	500	1,000	300	200	200
	Multifamily						
17	Units of Service		0	0	0	0	0
18	Allocated Cost - \$	0	0	0	0	0	0
	Commercial						
19	Units of Service		200	1	200	200	48
20	Allocated Cost - \$	1,000	200	500	100	100	100
	Industrial						
21	Units of Service	10 000	3,300	13	5,100	5,000	12
22	Allocated Cost - \$	13,000	3,000	6,200	2,300	1,500	0
•••	Surcharge				0	0	
23	Units of Service	0			0	0	
24	Allocated Cost - \$	0			0	0	
25	Total Outside City	16,200	3,700	7,700	2,700	1,800	300
26	Total System	12,952,500	2,558,600	6,675,300	1,762,100	1,143,900	812,600

Table 31 Wastewater Utility Comparison of Allocated Cost of Service with Revenue Under Existing Rates Test Year 2005

			Revenue	
		Allocated	Under	Indicated
Line		Cost of	Existing	Revenue
No.		Service	Rates	Adjustment
		\$	\$	
	Inside City			
1	Residential	9,778,500	9,242,100	5.8%
2	Other Non-residential	3,137,000	2,606,500	20.4%
3	Surcharge	20,800	18,500	12.4%
4	Total Inside City	12,936,300	11,867,100	9.0%
	Outside City			
5	Residential	2,200	2,400	-8.3%
6	Non-residential	14,000	13,500	3.7%
7	Surcharge	0	0	0.0%
8	Total Outside City	16,200	15,900	1.9%
9	Total Wastewater Utility	12,952,500	11,883,000	9.0%

Table 32Wastewater UtilityExisting and ProposedWastewater Service Charges

	Existing	Proposed Wastewater Service Cha				harges		
	Rates	2005	2006	2007	2008	2009		
Inside City Limits								
Monthly Volume Charge - \$/1.	000 gallons							
First 2.000 gallons	Minimum	3.87	4.25	4.64	5.08	5.57		
Over 2,000 gallons	3.03	3.87	4.25	4.64	5.08	5.57		
Monthly Charge - \$/Bill								
Meter Size - Inches								
5/8 and 3/4	14.60	7.30	7.80	8.50	9.20	9.90		
1	14.80	7.30	7.80	8.50	9.20	9.90		
1 1/2	15.20	7.30	7.80	8.50	9.20	9.90		
2	15.80	7.30	7.80	8.50	9.20	9.90		
3	17.00	7.30	7.80	8.50	9.20	9.90		
4	21.00	7.30	7.80	8.50	9.20	9.90		
6	26.50	7.30	7.80	8.50	9.20	9.90		
8	32.00	7.30	7.80	8.50	9.20	9.90		
10	43.00	7.30	7.80	8.50	9.20	9.90		
12	51.00	7.30	7.80	8.50	9.20	9.90		
Excess Strength Surcharges - \$	5/pound							
BOD (in excess of 300 mg/l)	0.3700	0.3910	0.4242	0.4560	0.4877	0.5307		
TSS (in excess of 300 mg/l)	0.2010	0.2525	0.2766	0.2951	0.3176	0.3488		
Outside City Limits								
Monthly Volume Charge - \$/1,	000 gallons							
First 2,000 gallons	Minimum	4.41	4.66	5.07	5.53	6.05		
Over 2,000 gallons	4.10	4.41	4.66	5.07	5.53	6.05		
Monthly Charge - \$/Bill								
Meter Size - Inches								
5/8 and 3/4	16.50	9.10	9.60	10.50	11.40	12.30		
1	17.00	9.10	9.60	10.50	11.40	12.30		
1 1/2	18.50	9.10	9.60	10.50	11.40	12.30		
2	19.00	9.10	9.60	10.50	11.40	12.30		
3	20.50	9.10	9.60	10.50	11.40	12.30		
4	24.00	9.10	9.60	10.50	11.40	12.30		
6	30.00	9.10	9.60	10.50	11.40	12.30		
8	36.00	9.10	9.60	10.50	11.40	12.30		
10	47.00	9.10	9.60	10.50	11.40	12.30		
12	54.00	9.10	9.60	10.50	11.40	12.30		
Excess Strength Surcharges - \$	5/pound							
BOD (in excess of 300 mg/l)	0.4560	0.4560	0.4714	0.5047	0.5390	0.5900		
TSS (in excess of 300 mg/l)	0.2710	0.2990	0.3129	0.3326	0.3572	0.3945		

19-312(2) Multiple Living Units Customers served by a single meter shall be charged for water and sewer service according to the number of units served by the single meter, i.e., total usage will be divided by the number of living units served by the single meter to determine the charge per living unit, with the charge per living unit multiplied by the total number of living units served by the single meter to determine total charge. (Ord. 5701)

Table 33 Wastewater Utility Comparison of Revenue Under Proposed Rates with Allocated Cost of Service Test Year 2005

		Revenue		Revenue As
		Under	Allocated	A Percent
Line		Proposed	Cost of	of Cost of
No.		Rates	Service	Service
		\$	\$	
	Inside City			
1	Residential	9,825,600	9,778,500	100.5%
2	Non-residential	3,105,800	3,137,000	99.0%
3	Surcharge	20,800	20,800	100.0%
4	Total Inside City	12,952,200	12,936,300	100.1%
	Outside City			
5	Residential	2,500	2,200	113.6%
6	Non-residential	13,500	14,000	96.4%
7	Surcharge	0	0	0.0%
8	Total Outside City	16,000	16,200	98.8%
9	Total Wastewater Utility	12,968,200	12,952,500	100.1%

Combined Utilities

The water rates and wastewater user charges recommended herein are designed to meet cost of service for each year of the study period, 2005 through 2009.

The adequacy of the proposed increases in revenues from rates is demonstrated in the tables at the end of this section. These tables show the combined application of funds of both the water and wastewater utilities during the study period, including funds received based upon proposed revenue adjustments. Table 34 indicates the combined source of funds required to finance the major capital improvement program. Approximately 82 percent of the total funding requirement is expected to be provided by the issuance of revenue bonds with the remaining financing provided by available fund balances, annual cash financing, and interest earnings.

Table 35 is a combined statement of operations of the two utilities. It shows the projected revenues of the combined water and wastewater utilities including the proposed revenue increases. The revenue bond ordinance provides that debt service coverage must be at least 140 percent on all outstanding revenue bonds. The annual revenue bond debt service coverage shown in Table 35 ranges from about 156 percent to about 439 percent, well over the 140 percent minimum. Coverage required for issuance of parity water and wastewater revenue bonds will also be provided by the proposed annual revenue increases.

A comparison of total adjusted cost of service for the combined utilities with combined revenue under existing rates is shown in Table 36. The overall system revenue increase is 6.6 percent but the indicated revenue increases for the various customer classes differ because they reflect necessary cost of service adjustments. For example, revenue required from the inside City residential classes is required to be 5.4 percent.

Table 36 shows typical bills for the water and wastewater utilities under existing and proposed test year 2005 rates for inside City customers.

Table 34Combined UtilitiesMajor Capital Improvement Program Financing

Line								
No.		2004	2005	2006	2007	2008	2009	Total
		\$	\$	\$	\$	\$	\$	\$
	Source of Funds							
1	Beginning of Year Balance	7,473,800	2,941,500	17,742,400	5,242,800	40,900,700	30,497,600	7,473,800
2	Bond Proceeds	0	23,600,000	0	52,200,000	0	60,000,000	135,800,000
3	SRF Loan Proceeds	0	0	0	0	0	0	0
4	Cash Financing of Construction	8,100,000	6,300,000	5,000,000	4,500,000	4,500,000	4,500,000	32,900,000
5	Interest Income	105,700	243,800	232,400	543,000	720,900	848,400	2,694,200
6	Total Funds Available	15,679,500	33,085,300	22,974,800	62,485,800	46,121,600	95,846,000	178,868,000
	Application of Funds							
7	Major Capital Improvements	12,738,000	13,014,000	17,732,000	16,434,000	15,624,000	76,087,000	151,629,000
8	Bond Issuance Costs	0	354,000	0	783,000	0	900,000	2,037,000
9	SRF Loan Issuance Costs	0	0	0	0	0	0	0
10	Deposits to Bond Reserve Fund	0	1,974,900	0	4,368,100	0	5,020,700	11,363,700
11	Total Funds Applied	12,738,000	15,342,900	17,732,000	21,585,100	15,624,000	82,007,700	165,029,700
12	End of Year Fund Balance	2,941,500	17,742,400	5,242,800	40,900,700	30,497,600	13,838,300	13,838,300

Table 35Combined UtilitiesComparison of Projected Revenue Under IndicatedRevenue Adjustments With Projected Revenue Requirements

Line	— • •		• • • • •		• • • • •	• • • • •
No.	Description	2005	2006	2007	2008	2009
		\$	\$	\$	\$	\$
1	Revenue Under Existing Rates	22,613,700	23,041,600	23,470,300	23,899,600	24,328,600
2	Indicated Additional Revenue Required	1,498,700	3,170,200	5,030,700	7,098,100	9,391,700
3	Total	24,112,400	26,211,800	28,501,000	30,997,700	33,720,300
4	Other Operating Revenue	765,000	765,000	765,000	765,000	765,000
5	System Development Charge Revenue	800,000	800,000	800,000	800,000	800,000
6	Interest Income	701,000	733,500	835,500	929,600	1,037,700
7	Total Revenue	26,378,400	28,510,300	30,901,500	33,492,300	36,323,000
8	Operation and Maintenance Expense	14,156,800	15,074,200	15,513,300	16,217,500	16,926,300
9	Net Operating Revenue	12,221,600	13,436,100	15,388,200	17,274,800	19,396,700
	Debt Service					
10	Existing Revenue Bonds	1,039,400	1,042,200	1,046,300	1,045,800	1,051,200
11	Proposed Revenue Bonds	1,152,000	1,974,900	4,523,000	6,343,000	9,271,800
12	Existing SRF Loans	4,143,900	4,143,900	4,143,900	4,143,900	4,143,900
13	Proposed SRF Loans	0	0	0	0	0
14	Total Debt Service (a)	6,335,300	7,161,000	9,713,200	11,532,700	14,466,900
15	Routine Capital Additions	775,200	798,500	822,600	847,300	872,800
16	Deposits to Operating Reserve	162,100	7,500	152,964	174,744	182,742
17	Cash Financing of Construction	6,300,000	5,000,000	4,500,000	4,500,000	4,500,000
18	Net Annual Balance	(1,351,000)	469,100	199,436	220,056	(625,742)
19	Beginning of Year Balance (b)	10,728,600	9,377,600	9,846,700	10,046,136	10,266,192
20	End of Year Balance (b)	9,377,600	9,846,700	10,046,136	10,266,192	9,640,449
21	Maximum Annual Debt Service (c)	3,061,733	3,061,733	7,429,833	7,429,833	12,450,533
22	Debt Service Coverage	399.17%	438.84%	207.11%	232.51%	155.79%
23	Effective Annual Revenue Increase	6.63%	6.69%	6.75%	6.81%	6.86%

(a) Accrued monthly payments to the Principal and Interest Account.

(b) Excludes operating reserve, bond reserve and meter deposits.

(c) Maximum debt service payments to the bondholders from funds deposited into the Principal and Interest Account.

Table 36 Combined Utilities Comparison of Allocated Cost of Service with Revenue Under Existing Rates Test Year 2005

		Revenue	
	Adjusted	Under	Indicated
	Cost of	Existing	Revenue
	Service	Rates	Adjustment
	\$	\$	
Inside City			
Residential	16,878,100	16,012,500	5.4%
Other Non-residential	5,588,200	5,051,300	10.6%
Total Inside City	22,466,300	21,063,800	6.7%
Outside City			
Residential	21,400	23,300	-8.2%
Non-residential	463,600	440,400	5.3%
Subtotal Outside City	485,000	463,700	4.6%
Rural Water Districts	1,140,300	1,067,700	6.8%
Total Outside City	1,625,300	1,531,400	6.1%
Total Combined Utilities	24,091,600	22,595,200	6.6%
	Inside City Residential Other Non-residential Total Inside City Outside City Residential Non-residential Subtotal Outside City Rural Water Districts Total Outside City Total Combined Utilities	Adjusted Cost of ServiceInside CityResidentialOther Non-residentialTotal Inside CityTotal Inside CityResidentialNon-residential22,466,300Subtotal Outside CityRural Water DistrictsTotal Outside CityInter CitySubtotal Outside CityRural Water Districts1,140,300Total Combined Utilities24,091,600	RevenueAdjustedUnderCost ofExistingServiceRates $$$ $$$ Inside City16,878,10016,012,500Other Non-residential5,588,2005,051,300Total Inside City22,466,30021,063,800Outside City21,40023,300Non-residential463,600440,400Subtotal Outside City485,000463,700Rural Water Districts1,140,3001,067,700Total Outside City1,625,3001,531,400Total Combined Utilities24,091,60022,595,200

	Monthly		Existing Rates	5]	Proposed Rate	s	Total	Percent
Meter Size	Usage	Water	Wastewater	Combined	Water	Wastewater	Combined	Increase	Increase
Inches	1,000 gal.	\$	\$	\$	\$	\$	\$	\$	
Residential									
5/8	0	6.55	14.60	21.15	1.95	7.30	9.25	(11.90)	-56.3%
5/8	1	6.55	14.60	21.15	4.62	11.17	15.79	(5.36)	-25.3%
5/8	2	6.55	14.60	21.15	7.29	15.04	22.33	1.18	5.6%
5/8	4	11.59	20.66	32.25	12.63	22.78	35.41	3.16	9.8%
5/8	6	16.63	26.72	43.35	17.97	30.52	48.49	5.14	11.9%
5/8	10	26.71	38.84	65.55	28.65	46.00	74.65	9.10	13.9%
5/8	15	39.31	53.99	93.30	42.00	65.35	107.35	14.05	15.1%
5/8	20	51.91	69.14	121.05	55.35	84.70	140.05	19.00	15.7%
Multifamily									
5/8	0	6.55	8.54	15.09	1.95	7.30	9.25	(5.84)	-38.7%
5/8	1	6.55	11.57	18.12	4.26	11.17	15.43	(2.69)	-14.8%
5/8	2	6.55	14.80	21.35	6.57	15.04	21.61	0.26	1.2%
5/8	4	11.59	20.86	32.45	11.19	22.78	33.97	1.52	4.7%
5/8	6	16.63	27.92	44.55	15.81	30.52	46.33	1.78	4.0%
5/8	10	26.71	40.04	66.75	25.05	46.00	71.05	4.30	6.4%
5/8	15	39.31	55.19	94.50	36.60	65.35	101.95	7.45	7.9%
5/8	20	51.91	71.54	123.45	48.15	84.70	132.85	9.40	7.6%
Commercial									
2	50	115.26	161.24	276.50	106.40	200.80	307.20	30.70	11.1%
2	100	211.26	312.74	524.00	208.90	394.30	603.20	79.20	15.1%
3	200	421.96	616.94	1,038.90	422.00	781.30	1,203.30	164.40	15.8%
3	300	613.96	919.94	1,533.90	627.00	1,168.30	1,795.30	261.40	17.0%
4	500	1,005.96	1,529.94	2,535.90	1,040.00	1,942.30	2,982.30	446.40	17.6%
4	1,000	1,895.96	3,044.94	4,940.90	2,065.00	3,877.30	5,942.30	1,001.40	20.3%
Industrial									
3	200	421.96	616.94	1,038.90	388.00	781.30	1,169.30	130.40	12.6%
3	300	613.96	919.94	1,533.90	576.00	1,168.30	1,744.30	210.40	13.7%
4	2,500	4,565.96	7,589.94	12,155.90	4,715.00	9,682.30	14,397.30	2,241.40	18.4%
6	5,000	9,034.96	15,170.44	24,205.40	9,422.00	19,357.30	28,779.30	4,573.90	18.9%

Table 37 Comparison of Typical Monthly Bills Under Existing and Proposed 2005 Rates

System Development Charges

Many water and wastewater utilities assess system development charges to help offset costs for increased system capacity. Generally levied at the time building permits are required, the system development charges are assessed for increased water use and resultant wastewater flows which result from either (1) changes in use of a structure served by an existing connection to the system, or (2) a new connection to the system. For the purposes of this report, both sources of additional water use and wastewater flow are included in the term "new customer."

System development charges are based on the premise that new customers or developers should pay for required water and wastewater system capacity, to the extent that water and wastewater service charges do not support the investment for the required capacity. Similar charges are termed by other utilities as capital recovery fees, development charges, system capacity charges, impact fees, system equity charges, or other names. These charges represent the current demand requirement of each property and are not transferable to any other property located within the service area.

The cost of providing such capacity in water and wastewater system facilities for new customers can contribute significantly to the need for capital financing and service rates and/or taxes to support the financing. Collection of system development charges to partially or wholly finance new customer capacity requirements can, over time, significantly reduce the amount of financing and the magnitude of rate increases that otherwise might be needed. Ideally, system development charges should generate sufficient revenues to meet future expansion requirements so that existing users are not burdened by the costs of expansion caused by growth in system use by new users.

There are a number of alternative methods of establishing system development charges to recover the cost of expanding capacity in the system. A general discussion of the economic concepts of three such alternatives is presented in the following paragraphs.

Basic Methodologies

System development charges are traditionally assessed to new development to recover the value of system capacity constructed for new customer service. There is no single established method for the determination of system development charges that is both appropriate for all situations and perfectly equitable to all new customers. There are, however, various approaches which are currently recognized and utilized, some to a greater extent than others, by water and wastewater utilities. These methods can be categorized as follows:

- 1. System Buy-In. System development charges are designed to derive from the new customer an amount per connection equal to the "equity" in the system attributable to similar existing customers. (Note: The word "equity" refers to that portion of system value for which there is no offsetting debt. It does not imply ownership of, or title to, utility facilities.)
- 2. Incremental Cost-Pricing. System development charges are designed to derive from the new customer the marginal, or incremental cost of system expansion associated with new customer growth. This method is based on the premise that new connections to the water and wastewater systems should be responsible for those costs which they cause to be incurred for the most recent or next increment of required system capacity, except as such costs are recovered from user fees or other utility charges.
- 3. Value of Service. System development charges are based on non-direct cost based considerations such as the fees that other area utilities charge, estimated opportunity or substitute costs, et al. Unlike the system buy-in or incremental cost-pricing methods, this method does not require extensive analyses in valuation and cost determination.

Revenues derived from system development charges are commonly used to offset part or all capital costs to accomplish any of the following objectives:

- 1. To pay the capital costs of future capacity provided for growth.
- 2. To provide rate relief to existing system users by recovering that portion of the annual existing and future capacity capital costs associated with growth, including debt service requirements and direct asset purchases from current revenues.
- 3. To accumulate reserves to finance system improvements and expansions required to meet growth needs.

Since the system buy-in method for developing system development charges requires the selection of a basis for determining plant value, a discussion of asset valuation methods follows.

Asset Valuation Methods

Various methods are employed to estimate the value of utility facilities required to furnish service to new users. The two principal methods commonly used to value a utility's properties are original cost and reproduction cost.

Original Cost

The principal advantages of the original cost method lie in its relative simplicity and stability, since the recorded costs of tangible property are held constant.

The major criticism levied against original cost valuation pertains to the disregard of changes in the value of money over time which are attributable to inflation and other factors. As evidenced by history, prices have tended to increase rather than to remain constant. Because the value of money varies inversely with changes in price, monetary values in most recent years have exhibited a definite decline; a fact not recognized by the original cost approach. This situation causes further problems when it is realized that most utility systems are developed over time on a piecemeal basis as demanded by service area growth. Consequently, each property addition was paid for with dollars of different purchasing power. When these outlays are added together to obtain a plant value the result can be seriously misleading.

Reproduction Cost

Changes in the value of the dollar over time, at least as considered by the impact of inflation, can be recognized by reproduction cost property valuation. The reproduction cost represents the cost of duplicating the existing utility facilities (or duplicating its function) at current prices. Unlike the original cost approach, the replacement cost method recognizes price level changes that may have occurred since plant construction.

The most accurate reproduction cost valuation would involve a physical inventory and appraisal of plant components in terms of their reproduction costs at the time of valuation. However, with original cost records available, a reasonable approximation of reproduction cost plant value can most easily be ascertained by trending historical original costs. This approach employs the use of cost indices to express actual capital costs experienced by the utility in terms of current dollars. An obvious advantage of the reproduction cost approach is that it gives consideration to changes in the value of money over time.

Depreciation

Considerations of the current value of utility facilities may also be materially affected by the effects of age and depreciation. Depreciation takes into account the anticipated losses in plant value caused by wear and tear, decay, inadequacy, and obsolescence. To provide appropriate recognition of the effects of depreciation on existing utility facilities, both the original cost and reproduction cost valuation measures can also be expressed on an original cost less depreciation (OCLD) and a reproduction cost less depreciation (RCLD) basis. These measures are identical to the aforementioned valuation methods, with the exception that accumulated depreciation is computed for each asset account based upon its age or condition, and deducted from the respective total original cost or reproduction cost to determine the OCLD or RCLD measures of plant value.

Recognition of depreciation in establishing value for purposes of system development charge under the system buy-in approach is appropriate in consideration of the fact that, once the new connector has "bought into" the system, he assumes the same status as similar existing customers. This includes assumption of the same responsibilities for future replacement of worn out or obsolete facilities.

System Development Charge Determination Methods

Three methods of developing system development charges which are currently employed by water and wastewater utilities were introduced in a preceding section of this report. These include the system buy-in, incremental cost-pricing, and value-of-service methods, which are further described in the following paragraphs.

System Buy-In Method

Under this method, system development charges are based upon the "buy-in" concept that new customers, at the time of connection, should pay an amount per connection equal to the equity in the system attributable to existing customers. To recover this equity, system development charges should be designed to recover the cost or current value of applicable service facility capacity associated with each new customer connection. An appropriate basis for calculating a system development charge would include consideration of the total capital investment value less depreciation, less any outstanding utility debt in excess of available debt service reserves and unused construction funds, less any applicable grants or funding from non-utility sources, divided by the facility service capacity.

As previously discussed, there are two principal methods of determining the value of utility system investment: OCLD and RCLD. Unless the City desires to recover only the historical costs of investment, the RCLD value approach is considered to be the most appropriate valuation method because it recognizes the current value of plant investment. It is noted that under the RCLD method, it is necessary to revise system development charges periodically to account for construction cost escalation and depreciation. The system buy-in method typically tends to be best suited for application when there is adequate capacity available in existing facilities to serve new customers.

Incremental Cost-Pricing Method

This method is based on the premise that new system users should be responsible for

the value of the latest or next increment of capacity which they cause to be incurred. Accordingly, system development charges would be designed to derive the marginal or incremental cost of system expansion as may be determined by recent construction cost experience or planned future improvements.

In order to determine the true incremental cost of system expansion, it is necessary to conduct a detailed engineering analysis to establish the facilities required to increase the design capacity to a specific level to accommodate additional new customers. Depending upon circumstances, the capacities of existing facilities which are available for new customers and their associated current value (RCLD) may also need to be recognized. The incremental cost of these specific facilities is then divided by the associated capacity provided to determine the incremental unit cost of additional capacity. In deriving system development charges using the incremental cost-pricing method, appropriate reductions in rates should be made to credit any obligation or debt which will eventually be recovered from future users through the payment of ongoing user fees or other utility charges.

Use of this method is generally considered to be most appropriate when a significant portion of the capacity required to serve new customers must be provided by the construction of new facilities.

Value-of-Service Method

The value-of-service method is sometimes employed to develop system development charges for utilities. Though often simpler to employ than the system buy-in or incremental cost-pricing methods, it does not typically recognize the direct cost or value of utility facilities required to provide service for the particular utility facilities involved. Rather, under this method, system development charges are based on considerations such as the rates charged by other communities, the cost of service from available alternative facilities, or other similar measures. Because value of service measures are not typically based on the direct costs or value of facilities of the utility actually providing service, this method is not as readily supportable in adversary proceedings. Accordingly, additional consideration related to this method is not discussed in this report.

System Capacity Charge Calculation Methodology

Based on an evaluation of the alternative methodologies previously presented, the approach selected as the most suitable for the City of Lawrence at this time is a combination of the system buy-in and incremental cost-pricing methodologies. This combined methodology is capable of recovering costs from new customers in an equitable manner and can easily be supported by available investment records. A discussion of the major elements required for determining system development charges under this combined methodology is

presented in the following paragraphs.

Existing Plant Investment

The value of facilities included in the water and wastewater systems are maintained in the City's Asset Register on an Original Cost and Original Cost Less Depreciation Basis. Current City policy requires developers to construct local water distribution and sewer collection facilities as part of their development. The value of this investment is not recorded in the City's Asset Resister. If such investment was included in the City's records, a corresponding entry for contributed capital would also be recorded which would directly offset the local facilities for purposes of developing system development charges. The asset records show investment in small equipment and office furniture that are normally financed by water and wastewater charges and not considered to be backbone facilities. However, this investment is relatively minor in comparison to the infrastructure related facilities. Therefore, almost all of the investment currently shown in the Asset Register is related to major backbone related facilities which is included in the development of system development charges. The City's Annual Financial Report for the Fiscal Year Ended 2003 may also not show all of the developer, state, or federal contributed capital provided to the Water and Sewer Fund.

In order to reflect the current value of all backbone related facilities in the system, original costs shown in the City's Asset Register as of December 31, 2003 are adjusted for depreciation and inflated to current cost levels using construction cost indices published by Engineering News Record for the Kansas City, Missouri region.

Applicable Plant Equity

The plant equity to be used for determining system development charges is equal to the total plant value less non-equity credits as shown in Table 38. Total plant value is equal to the value of existing plant investment expressed on a Reproduction Cost Less Depreciation basis, as previously discussed, less investment in any non-rate base facilities and state and federal contributions received by the utilities, plus construction work in progress, unrestricted cash balances available for capital improvements, and available reserves. Non-ratebase facilities may include local developer contributed facilities and facilities operated by a utility but not used to provide general service. For example, the investment in the waste hauler receiving facility does not benefit sanitary sewer customers and is excluded from system development charges. Since non-ratebase investment in the City's Asset Register, only includes small equipment and furniture, only a minor adjustment in total plant investment is required. Construction work in progress as of December 31, 2003 is assigned to the two utilities on the basis of the description of projects currently under construction. Unrestricted cash balances available at the end of 2003 are allocated to the two utilities on the basis of need as estimated by the respective capital financing plans. Two restricted balances are also included in plant value. Funds held in the Bond Reserves were funded by bond proceeds and are required to be added to plant value to offset the non-equity credit of the related outstanding debt. Funds maintained in the utilities operating reserves, as a condition of the bond ordinances, are also added to plant value because the interest earned on these funds will benefit new customers through reduced utility rates but the new customers did not fund any portion of these reserves. Total plant value could potentially be increased by adding the portion of inventories related to capital improvements and repairs. Current inventories are not included in total plant value because of the uncertainty of the extent to which such inventories are capital related.

An adjustment is made to the non-equity credits or outstanding debt to add back the portion of outstanding debt that is attributable to growth related facilities required to serve new customers. This provides that all new customers pay a fair share of the growth related facilities required to serve them, which recognizes incremental cost-pricing considerations, plus a share of the existing facilities serving all customers, which recognizes system buy-in considerations.

System Capacity

System capacity for each utility is expressed on the basis of design capacity in million gallons per day (mgd). Design capacity for the water utility is expressed on a maximum day demand basis because it is the design criteria used for water treatment plants and capacity for the wastewater utility is expressed on average day capacity. Since flow attributable to infiltration/inflow can not be directly billed to customer classes but uses part of the treatment plant's capacity, an allowance for average annual infiltration/inflow must be deducted from total average wastewater treatment plant design capacity. Net available capacity for the wastewater treatment plant is shown at the current12.5 mgd level less a 20 percent allowance for infiltration/inflow. As shown in Line 20 of Table 38, the City has 32.5 mgd of total water treatment plant capacity and will have 10.0 mgd of net wastewater treatment plant capacity available to meet the service requirements of existing and new customers.

Unit Equity Value

The equity value of one unit of capacity (one gallon per day or gpd) is used as the basis for determining system development charges. Unit equity value, as shown in Line 21 of Table 38, is determined by dividing total equity value (Line 17) by net billable system capacity (Line 20). An allowance for recovering the financing costs during the design and construction of new capital improvements as well as holding any resulting excess capacity

for new users is built into the unity equity value as shown in Line 22 of Table 38. This adjustment assumes existing customers will pay financing costs for new improvements at the current estimated cost of revenue bonds over a three year period and are entitled to be reimbursed for such payments by new customers.

Customer Service Requirements/Classification

Customer service requirements can be established on a number of different basis. The basis determined to be most suitable for the City of Lawrence is the size of the water meter required to serve a premise. This provides a direct capacity relationship for the design of water system development charges but only a general relationship for the design of wastewater system development charges. For water users, the relative capacity of each meter can be used to establish meter capacity relationships to the capacity of a 5/8-inch water meter. These resulting ratios can then be used to develop relative system development charges for all new water customers.

For wastewater users, it is assumed that the percentage of water discharged to the sewer system is approximately the same for all customers. Adjustments for commercial customers using a large portion of water in their product or customers whose meter is specifically sized to meet irrigation or fire protection requirements in addition to their sanitary needs, are necessary for this classification system. Under this basis, wastewater related system development charges applicable to 5/8-inch water meters are based on estimated wastewater flows of record, as may be established for individual classes of customers or for all customers.

Residential wastewater customers are billed for wastewater service based on water used during the preceding winter months of December through February. This billing procedure provides a reasonable estimate of wastewater discharged to the sewer system by residential users and supports the separation of residential customers from all other wastewater customers for billing purposes. A differentiation of wastewater system development charges is not made for residential customers served by differently sized water meters because the winter water usage or estimated wastewater discharged from each residential premise was found to be about the same, regardless of meter size. The same meter capacity ratios used to develop system development charges for water customers are used to develop similar charges for non-residential wastewater customers.

System Development Charges

Water utility system development charges can be determined for each new customer by applying the respective unit equity value or system development unit charge to the equivalent customer demand by meter size An analysis of historical maximum day demands

and the number of equivalent 5/8-inch customers served was conducted for a recent 5-year This analysis excluded the estimated maximum day demand and equivalent period. customers applicable to wholesale customers since system development charges are not applicable to this customer class. The maximum day demand per equivalent customer most recently occurred in calendar year 2000. The indicated value of 625 gpd per equivalent customer is less than the historic maximum that occurred in 1988 but is used in this report to be conservative and representative of current system conditions. Applying this equivalent unit of capacity to a unit equity charge of 2.00/gpd derives the 2005 system development charge of \$1,250 for all water customers served by 5/8-inch meters as shown in Table 39. This is less than the charge that would be derived by the indicated unit equity charge of \$2.52/gpd shown in Table 38. The lower value is used to be conservative and recognizes that the unit equity charge is projected to decrease in the future when increased water treatment capacity is included in the unit equity calculation. The 2005 system development charges for all other meter sizes is determined by applying the meter capacity ratios to the charge for a 5/8-inch meter. Since maximum day demand per equivalent customer is used by this analysis instead of average usage by customer class, as used in the existing charges, there is no longer a difference between the system development charges for residential customers and all other customers.

The average contributed wastewater volume for all residential users, regardless of meter size, was determined to be 148 gpd. This average volume applied to a unit equity value of 5.20/gpd yields the 2005 residential wastewater system development charge of \$770, as shown in Table 39. This is lower than the unity equity value determined in Table 38. The lower unity equity value is proposed for the development of wastewater system development charges to lessen the immediate cost impact on new customers. The full value of this charge is proposed to be phased-in over the five-year study period. The average contributed wastewater volume for all other customers served by 5/8-inch water meters was determined to be 270 gpd. Applying the unit equity value to this volume derives a system development charge of \$1,400 for non-residential wastewater customers served by a 5/8-inch water meter. The same meter capacity ratios used to develop system development charges for water customers are also used to develop system development charges for wastewater customers served by larger water meters. However, these indicated charges assume that all water used by the new customer is discharged to the sewer system. If water is to be used for lawn irrigation, product water, cooling, or other purposes that do not result in contributed wastewater volume, adjustments may need to be made for some non-residential wastewater customers.

The total combined system development charge for both water and wastewater service is proposed to be \$2,020 in 2005 for a typical residential customer served by a 5/8-

inch water meter. System development charges should gradually increase in the future as additional equity is gained by the repayment of outstanding revenue bond and SRF loan principal, and to the extent that continued cash financing of capital improvements exceeds the scheduled annual depreciation expense on existing facilities. As indicated by Table 39, combined water and wastewater system development charges for a residential customer served by a 5/8-inch water meter will increase from its current level of \$970 to \$3,290 in 2009. In comparison, the current system development charge imposed by Water District No. 1 of Johnson County for new 5/8-inch water service is \$2,350.

Table 38 Unit Equity Value Test Year 2005

Line		Water	Wastewater	
No.	Item	Utility	Utility	Total
		\$	\$	\$
	Plant Value (a)			
1	Total Plant Investment (RCLD)	54,826,000	47,011,000	101,837,000
2	Less Non-Ratebase	(622,000)	(504,000)	(1,126,000)
3	Plus Construction Work In Progress	11,168,000	47,258,000	58,426,000
	Less Contributions			
4	Recorded	0	(349,000)	(349,000)
5	Unrecorded	0	(5,320,000)	(5,320,000)
6	Plus Unrestricted Cash Balance	8,712,000	4,984,000	13,696,000
7	Plus Bond Reserves	0	5,909,000	5,909,000
8	Plus Operating Reserve	1,897,000	1,780,000	3,677,000
9	Total Plant Value	75,981,000	100,769,000	176,750,000
	Non Equity Credits			
	Outstanding Debt			
10	Series 1996	0	4,170,000	4,170,000
11	Series 1997	0	4,765,000	4,765,000
12	SRF 1260	0	41,017,000	41,017,000
13	SRF 2285	6,653,000	0	6,653,000
14	SRF 2087	5,435,000	0	5,435,000
15	Less Expansion Related Debt	(6,653,000)	(22,559,000)	
16	Total	5,435,000	27,393,000	62,040,000
17	Total Equity Value	70,546,000	73,376,000	143,922,000
	Net Average System Capacity - mgd			
18	Total	32.5	12.5	
19	Infiltration/Inflow Adjustment		2.5	
20	Net Billable Average Capacity	32.5	10.0	
	Unity Equity Value - \$/gpd			
21	Total	2.17	7.34	
22	Adjusted Total (b)	2.55	8.62	

(a) Plant value at beginning of 2005.

(b) Includes allowances for three years of carrying capacity at a 5.5 percent annual interest charge.

mgd - million gallons per day

gpd - gallons per day

	Existing	2005	2006	2007	2008	2009
	\$	\$	\$	\$	\$	\$
			Water	Utility		
Residential				-		
5/8"	420	1.250	1.300	1.350	1.390	1.440
1"	1,140	3,130	3,250	3,370	3,480	3,600
1-1/2"	2,410	6,250	6,490	6,730	6,960	7,200
2"	5,250	10,000	10,380	10,760	11,140	11,520
All Other						
5/8"	560	1,250	1,300	1,350	1,390	1,440
1"	1,770	3,130	3,250	3,370	3,480	3,600
1-1/2"	4,400	6,250	6,490	6,730	6,960	7,200
2"	6,870	10,000	10,380	10,760	11,140	11,520
3"	(a)	18,750	19,460	20,180	20,890	21,600
4"	(a)	31,250	32,440	33,630	34,810	36,000
6"	(a)	62,500	64,880	67,250	69,630	72,000
8"	(a)	125,000	129,750	134,500	139,250	144,000
10"	(a)	187,500	194,630	201,750	208,880	216,000
12"	(a)	275,000	285,450	295,900	306,350	316,800
16"	(a)	687,500	713,630	739,750	765,880	792,000
			Wastewat	er Utility		
Residential				-		
All Meters	550	770	1 040	1 310	1.580	1 850
All Other			-,	-,	-,	-,
5/8"	870	1 400	1 900	2 390	2 890	3 380
1"	2 800	3 500	4 740	5 980	7 210	8 4 50
1-1/2"	6.860	7.000	9.480	11,950	14.430	16,900
2"	10,690	11,200	15,160	19,120	23,080	27,040
3"	(a)	21,000	28,430	35,850	43,280	50,700
4"	(a)	35,000	47,380	59,750	72,130	84,500
6"	(a)	70,000	94,750	119,500	144,250	169,000
8"	(a)	140,000	189,500	239,000	288,500	338,000
10"	(a)	210,000	284,250	358,500	432,750	507,000
12"	(a)	308,000	416,900	525,800	634,700	743,600
16"	(a)	770,000	1,042,250	1,314,500	1,586,750	1,859,000

Table 39System Development Charges

(a) Determined based on analysis of new customer's anticipated use of the system.

Appendix

Definition of Water Terms

Backbone Facilities: Those facilities, or a portion of those facilities that have been identified as being required to serve all customers exclusive of all local facilities contributed by developers or others. The cost of these facilities will be recovered in total or in part through a System Development Charge.

Base Costs: Costs which vary directly with the quantity of water used under average load conditions without regard to the elements necessary to meet water use variations or peak demand. Base costs are those operating and capital costs of the water system associated with serving customers to the extent required for a constant average rate of use.

Base-Extra Capacity methodology: Method of cost allocation which recognizes the fact that costs of serving customers are dependent not only on the total volume of water used (base), but also on the peak rate of use in excess of base average use (extra capacity).

Bonds: Refers to the existing bonds and all additional bonds. The term "Bonds" includes, but is not limited to, obligation in the form of bonds, notes, contracts, lease obligations, bond anticipation notes, commercial paper, and certificates of participation. The term "Bond" or "Bonds" does not include any obligations incurred by the City on a subordinated basis.

Capital Improvement Program: Refers to the City's comprehensive plan consisting of major water system projects intending to enhance or restore system capabilities.

City: Refers to the City of Lawrence, Kansas.

Coincidental Peak Demand: The maximum amount of simultaneous, or coincidental, demand of all customers on the system occurring at one point in time.

Commodity Charge: Charge for a unit volume of water designed to recover base and extra-capacity costs.

Connection Charge: The charge made by the utility to recover the cost of connecting the customer's service line to the utility's facilities. This charge is often considered as a contribution of capital by the customer or other agency applying for service; although it is most often considered as a utility revenue source. Refer to System Development Charge for the definition of another front-end fee sometimes levied on new applicants for service.

Construction Work In Progress (CWIP): The utility's investment in facilities under construction, but not yet dedicated to service.

Cost Allocation: Process of distributing cost of service (revenue requirements to be recovered from rates) to Functional Cost Components and then to Customer Classes on the basis of their relative use of the system (Units of Service) through application of unit costs.

Customer Class: A group of customers having homogeneous characteristics such as peak demand requirements.

Customer Costs: Costs which tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital charges associated with meters and services.

Debt Service Coverage: A measure of the adequacy of Net Revenues from operations to pay interest and principal payments on all proposed and/or outstanding bonds. Coverage requirements are often dictated by bond covenants, and are usually stated as the ratio of net revenues to actual or maximum debt service.

Depreciation: The loss in service value not restored by current maintenance as applied to depreciable plant facilities.

Direct Fire Protection Costs: Costs required to maintain and provide fire hydrants and apparatus for public and private fire protection purposes.

Equivalent Meters: A means of relating the costs and services associated with large meters to the costs and services associated with a 5/8 inch meter.

Expenses: The total operating expenses of the System as determined in accordance with generally accepted accounting principals, except, to the extent such items are included in such operating expenses, depreciation, interest on outstanding Bonds, and amortization of financing expenses.

Extra Capacity Costs: Represents those operating costs incurred due to demands in excess of average, and capital related costs for additional plant and system capacity beyond that required for the average rate of use. These costs may be subdivided into costs necessary to meet maximum day extra demand and maximum hour extra demand.

Functional Cost Components: Classification of costs or investment by system function, including base, extra capacity, customer and direct fire protection.

General Obligation Bonds: Bonds for the payment of which the full faith and credit of the issuing government are pledged, implying taxing powers to pay bondholders, if necessary.

Maximum Annual Debt Service: Refers to, at any point in time, with respect to Bonds then outstanding, the maximum amount of principal and interest becoming due on the Bonds in the then current or any future fiscal year.

Maximum Day Demand: The largest 24 hours of continuous water usage recorded in a given year.

Maximum Hour Demand: The largest recorded hourly usage in a given year. It does not necessarily occur on the day of maximum demand.

Minimum Charge: Charge designed to recover costs directly associated with customers including meter reading, billing, collection and accounting, maintenance and capital charges associated with meters and services, as well as an allowance for the readiness of the utility to serve customers.

Net Revenues: Refers to, for any given period, the Revenues less the Expenses for such period, but excluding any profits or losses on the early extinguishment of debt or on the sale or other disposition, not in the ordinary course of business, of investments or fixed or capital assets.

Noncoincidental Peak Demand: The maximum demands of individual customers or customer classes of service which may or may not occur in the same time interval.

Operating Reserve: Refers to an amount of funds held for the purpose of meeting normal operation and maintenance expenses for a specified time in the event of a loss of revenue.

Operation and Maintenance Expenses: The reasonable and necessary current expenses of the City paid or accrued in operating, maintaining and repairing the System.

Peak Demand: The maximum system demand which occurs on a water system. Peak demands may be annual, seasonal, monthly, daily, or hourly in terms of time reference.

Private Fire Protection Charges: Charges for fire protection service provided through sprinkler systems, standpipes, or hydrants owned by the customer.

Rate Base: The value of a water utility's property used in computing return on investment.

Revenues: Refers to all rates, fees, rentals, other charges income and revenue property allocable to the System in accordance with generally accepted principals resulting from the ownership or operation of the System, except customer deposits and any other deposits subject to refund by the City.

Revenue Bonds: Bonds payable solely from net or gross non-tax revenues derived from charges or rents paid by users of the facilities constructed with the proceeds of the bond issue.

State: Refers to the State of Kansas.

System: Water plant and equipment owned or leased by the City including, but not limited to, all contracts for services, equipment, facilities, water rights, licenses, storage rights, easements, treatment, transportation and distribution facilities and all real and personal property related to the operation or maintenance thereof.

System Development Charge: A contribution of capital towards completed or planned future backup plant facilities necessary to meet the service needs of new customers
to which such fees apply. Various terms have been used to describe these charges in the industry, but regardless of the term used, these charges have the purpose of providing funds to be used to finance all or part of capital improvements necessary to serve new customers and are raised outside of capital to be served from general utility rates.

Unit Cost: Allocated functional costs divided by related system units of service.

Units of Service: Measurement of the quantity of service provided to customer groups or classes expressed in terms of base use (volume), maximum day extra capacity, maximum hour extra capacity, meters and services, billing, and direct fire protection.

User Charges or User Fees: Refers to water minimum and commodity charges, connection fees, inspection fees, and miscellaneous fees and charges imposed by the City with respect to the Water System.

Water System: (See System)

Definition of Wastewater Terms

Backbone Facilities: Those facilities, or a portion of those facilities that have been identified as being required to serve all customers exclusive of all local facilities contributed by developers or others. The cost of these facilities will be recovered in total or in part through a System Development Charge.

Biochemical Oxygen Demand (BOD): A measure of the quantity of oxygen utilized by microorganisms to break down complex organic materials into simple, more stable substances. BOD measurements are used as a measure of the organic strength of wastewater.

Bonds: Refers to the existing bonds and all additional bonds. The term "Bonds" includes, but is not limited to, obligation in the form of bonds, notes, contracts, lease obligations, bond anticipation notes, commercial paper, and certificates of participation. The term "Bond" or "Bonds" does not include any obligations incurred by the City on a subordinated basis.

Capital Improvement Program: Refers to the City's comprehensive plan consisting of major sewer system projects intending to enhance or restore system capabilities.

City: Refers to the City of Lawrence, Kansas.

Clean Water Act: Common term for the Federal Water Pollution Control Act of 1948, with major amendments in 1972 (PL 92-500), in 1977 by the Clean Water Act (PL 95-217) and in 1987 by the Water Quality Act (PL 100-4), as further amended, 33 U.S.C. 1251, et seq.

Code of Federal Regulations: Law of the United States issued under several Titles. Title 40 deals with protection of the environment. Part 35 deals with specific regulations, including user charge requirements, for wastewater utilities that have accepted construction grants from the Federal Government.

Connection Charge: The charge made by the utility to recover the cost of connecting the customer's service line to the utility's facilities. This charge is often considered as a contribution of capital by the customer or other agency applying for service; although it is most often considered as a utility revenue source. Refer to System Development Charge for the definition of another front-end fee sometimes levied on new

applicants for service.

Construction Work In Progress (CWIP): The utility's investment in facilities under construction, but not yet dedicated to service.

Cost Allocation: Process of distributing cost of service (revenue requirements to be recovered from rates) to Functional Cost Components and then to Customer Classes on the basis of their relative use of the system (Units of Service) through application of unit costs.

Customer Class: A group of customers having homogeneous characteristics such as peak demand requirements.

Customer Costs: Costs which tend to vary in proportion to the number of customers connected to the system. These include water meter reading, billing, collecting and accounting, and maintenance and capital charges associated with water meters and services.

Debt Service Coverage: A measure of the adequacy of Net Revenues from operations to pay interest and principal payments on all proposed and/or outstanding bonds. Coverage requirements are often dictated by bond covenants, and are usually stated as the ratio of net revenues to actual or maximum debt service.

Depreciation: The loss in service value not restored by current maintenance as applied to depreciable plant facilities.

Discharger: Any user which contributes wastewater to the sewer system.

Domestic-strength Wastewater: Wastewater principally contributed from residential dwellings. This wastewater is also commonly called normal- strength wastewater.

Environmental Protection Agency (EPA): A regulatory agency established by the U.S. Congress to administer the Nation's environmental laws.

Excess-Strength Wastewater: Wastewater having BOD and suspended solids strength above domestic-strength wastewater. Excess-strength wastewater is wastewater with a BOD strength above 350 ppm and suspended solids concentration greater than 300 ppm. Industrial waste surcharges apply to all industrial users discharging excess-strength wastewater to the sewer system.

Expenses: The total operating expenses of the System as determined in accordance with generally accepted accounting principals, except, to the extent such items are included in such operating expenses, depreciation, interest on outstanding Bonds, and amortization of financing expenses.

Functional Cost Components: Classification of costs or investment by system function, including volume, capacity, BOD, and suspended solids, and customer components.

General Obligation Bonds: Bonds for the payment of which the full faith and credit of the issuing government are pledged, implying taxing powers to pay Bondholders, if necessary.

Industrial User: Users of the wastewater system which discharge wastewater of different quality than normal or domestic-strength wastewater.

Infiltration/Inflow (I/I): Water entering the sewer system either through groundwater infiltration (e.g. sewer joints or cracks) or surface water inflow (e.g. manhole covers, catch basins, or roof drains).

Interceptor Sewer: A sewer that receives dry-weather flow from a number of transverse sanitary sewers, as well as some infiltration/inflow and conducts the total flow to a treatment or disposal point.

Maximum Annual Debt Service: Refers to, at any point in time, with respect to Bonds then outstanding, the maximum amount of principal and interest becoming due on the Bonds in the then current or any future fiscal year.

Minimum Charge: Charge designed to recover costs directly associated with customers including meter reading, billing, collection and accounting, maintenance and capital charges associated with meters and services, a share of Infiltration/Inflow costs, and an allowance for the readiness of the utility to serve customers.

National Pollutant Discharge Elimination System (NPDES): The national permit program for controlling the quality of waters discharged to the Nation's receiving streams.

Net Revenues: Refers to, for any given period, the Revenues less the Expenses for such period, but excluding any profits or losses on the early extinguishment of debt or on the sale or other disposition, not in the ordinary course of business, of investments or fixed or capital assets.

Noncategorical Industrial User: Industrial users who are not subject to Federal Categorical Pretreatment Standards.

Operating Reserve: Refers to an amount of funds held for the purpose of meeting normal operation and maintenance expenses for a specified time in the event of a loss of revenue.

Operation and Maintenance Expenses: The reasonable and necessary current expenses of the City paid or accrued in operating, maintaining and repairing the System.

Outfall Sewer: A sewer that receives wastewater from a collection system or from a treatment plant and directs it to a point of final discharge.

Permittee: An industrial user required to maintain an industrial waste permit due to the quality or quantity of their wastewater or point of discharge.

Primary Treatment: Refers to the first stage of wastewater treatment whereby a substantial amount of suspended matter is removed by sedimentation or other means.

Rate Base: The value of a wastewater utility's property used in computing return on investment.

Reserve Fund Requirement: Refers to an amount required to be held in the Debt Service Reserve Fund by the General Resolution.

Revenue Bonds: Bonds payable solely from net or gross non-tax revenues derived from charges or rents paid by users of the facilities constructed with the proceeds of the bond issue.

Revenues: Refers to all rates, fees, rentals, other charges income and revenue property allocable to the System in accordance with generally accepted principals resulting from the ownership or operation of the System, except customer deposits and any other

deposits subject to refund by the City.

Secondary Treatment: Refers to the treatment of wastewater by biological methods after primary treatment.

Series: Refers to Bonds issued at the same time or sharing some other common term or characteristic and designated as a separate Series.

Significant Industrial User (SIU): Refers to: (1) all dischargers subject to categorical pretreatment standards, (2) all noncategorical dischargers that have a reasonable potential to adversely affect the City's wastewater treatment plants' operation, and (3) all noncategorical dischargers that contribute an average of 25,000 gallons per day of process wastewater to the sewer system.

State: Refers to the State of Kansas.

Suspended Solids (SS): Synonymous with total suspended solids (TSS).

System: Refers to the City's entire wastewater collection, transportation, drainage, treatment, and disposal system, including all sewers, pipes, buildings, systems, plants, works, equipment, improvements, and other facilities or undertakings of the City relating to the collection, transportation, treatment, and disposal of sewage, wastewater, industrial wastewater, and infiltration/inflows incidental thereto, including any and all subsequent additions, extensions, improvements, acquisitions, and replacements thereto and all facilities and undertakings relating to or useful in connection with the construction, improvement, replacement, expansion, extension, operation, and maintenance of the System. The term System more specifically includes, but is not limited to, sewage and wastewater treatment and disposal plants, sewage pumping plants, sewer maintenance yards and headquarters, intercepting and collection sewers, outfall sewers, trunk, connecting, relief, and other sewer mains and additions to, alterations of and reconstruction of, any of them and the lands, rights of way, pipe, conduits, equipment, machinery, apparatus, and property necessary therefor.

System Development Charge: A contribution of capital towards completed or planned future backup plant facilities necessary to meet the service needs of new customers to which such fees apply. Various terms have been used to describe these charges in the industry, but regardless of the term used, these charges have the purpose of providing funds to be used to finance all or part of capital improvements necessary to serve new customers

and are raised outside of capital to be served from general utility rates.

Total Suspended Solids (TSS): A measure of the insoluble solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquids. TSS is one common measurement of wastewater strength.

Unit Cost: Allocated functional costs divided by related system units of service.

Units of Service: Measurement of the quantity of service provided to customer groups or classes expressed in terms of volume, capacity, extra strength (BOD and suspended solids), and billing.

User Charges or User Fees: Refers to sewer service charges, excess strength surcharges, inspection fees, and miscellaneous fees and charges imposed by the City with respect to the Wastewater System.

Wastewater System: (See System)