

Draft Report



Water Tap Fee Study

City of Lee's Summit
November 2022





November 18, 2022

Mr. Jeff Thorn
City of Lee's Summit
1200 SE Hamblen Road
Lee's Summit, Missouri 64081

Subject: Draft Report Water Tap Fee Study

Dear Mr. Thorn:

Enclosed please find HDR's draft report regarding the water tap fee study for the City of Lee's Summit (City). The development of this report is intended to provide to the City the basis to establish cost-based water tap fees. The adoption of final tap fees are a policy decision of the City Council.

This report has been prepared using generally accepted financial and engineering principles. The City's financial, planning, and engineering data were the primary sources for much of the information contained in this report. HDR would recommend that prior to implementing the fees, the tap fees be reviewed by City legal counsel for compliance with Missouri State law.

HDR appreciates the opportunity to assist the City in this matter. We also would like to thank you and your staff for the assistance provided to us. We look forward to future opportunities to work with the City.

Sincerely yours,
HDR Engineering, Inc.

A handwritten signature in blue ink that reads "Judy Dean". The signature is fluid and cursive.

Judy Dean
Senior Financial Analyst



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Executive Summary

Introduction

HDR Engineering Inc. (HDR) was retained by the City of Lee's Summit (City) to update the water tap fees. The purpose of tap fees is to recover the costs of public facilities in existence at the time the fee is imposed, and for new public facilities to be acquired or constructed in the future that are of proportional benefit to the person or property being charged. These fees are charged to new customers connecting to the system, or the incremental increase for existing customers increasing their demands compared to the value of their existing (pre-expansion) capacity. By establishing cost-based water tap fees, the City attempts to have growth-pay-for-growth by having new customers pay their share of the infrastructure in place which will serve them, while also reflecting the value of existing utility customer financing of the capacity available in the existing system. In this way, the City is maintaining equity between new and existing customers for the financial impacts of growth.

General industry practice recommends adjusting tap fees annually for changes in the costs of construction, and to update the tap fees every three to five years, or whenever comprehensive planning documents for the systems are updated. By establishing cost-based tap fees, the City is being proactive and taking an important step in providing adequate infrastructure to meet growth-related needs, and more importantly, providing this required infrastructure to new customers in a cost-based and equitable manner.

Study Overview

The tap fees are calculated in conformance with generally accepted rate making practices and are based on the City's planning and design criteria. The tap fees are based on the existing infrastructure and future capital improvements needed to serve growth divided by the number of equivalent residential units (ERUs) that will be served. A component buy-in (existing) and expansion (future) approach is taken in developing the tap fees as each component can have different planning and design criteria.

The calculations take into account the financing mechanisms of capital improvements. These tap fees are implemented according to the capacity requirement (i.e., the impact) each new connection places on the water system. This way, the tap fees are related to the costs the new customer places on the systems and the benefit they derive from infrastructure in place to serve them.

The City currently implements the water tap fees based on the size of the meter. Table ES-1, below, shows the existing and calculated water tap fees.

**Table ES-1
Current and Proposed Water Tap Fees**

Meter Size	Meter Type	Meter Capacity ⁽¹⁾ (gpm)	Capacity Multiplier ⁽²⁾ (CM)	Current Tap Fee ⁽³⁾	Calculated Tap Fee
5/8" x 3/4"	Displacement	15	1.0000	\$3,730	\$3,760
3/4"	Displacement	25	1.6676	6,215	6,270
1"	Displacement	40	2.6676	9,945	10,030
1 1/2"	Displacement	50	3.3338	12,435	12,535
2"	Displacement	100	6.6676	24,865	25,070
2"	Compound	160	10.6676	39,785	40,110
3"	Compound	320	23.3338	79,575	80,220
4"	Compound	500	40.0000	124,335	125,350
6"	Compound	1,000	83.3338	248,665	250,695
8"	Compound	1,600	120.0000	397,865	401,115
10"	Compound	2,300	153.3338	571,935	576,600

(1) AWWA M6 Water Meters – Selection, Installation Testing and Maintenance 1999, Table 5-3, p 54-55.

(2) Capacity Multiplier (CM) = meter capacity relative to a 5/8 x 3/4" displacement type meter.

(3) Current water tap fee as of July 1, 2022.

The calculated water tap fees for a 5/8" x 3/4" meter size is \$3,760 which is an increase of \$30 from the current water tap fee of \$3,730. The City, as a matter of policy, may charge any amount up to the cost-based water tap fee but not over that amount. Charging an amount greater than the net allowable water tap fee would not meet the practical basis of charging cost-based tap fees that are proportionally related to the benefit derived by the customer. .

Consultant's Recommendation

Based on our review and analysis of the City's water tap fees, HDR makes the following recommendations:

1. The City should adopt the water tap fees for new connections which are no greater than the net allowable water tap fees as set forth in this report.
2. The City should annually update the water tap fees by a local construction cost index such as the Engineering News Record Construction Cost Index (ENR-CCI). It is recommended at a minimum after five years a review and update of the water tap fees is completed. Industry best practice of annual inflationary adjustment can keep the tap fees (water system infrastructure investment) relatively current with construction pricing practices.
3. The City should update the actual calculations for the water fees at such time when a new capital improvement plan, public facilities plan, comprehensive system plan, or a comparable plan is approved or updated by the City, or every five years.

Disclaimer

HDR, in its calculation of the tap fees for water presented in this report, has used generally accepted engineering and ratemaking principles¹. This should not be construed as a legal opinion with respect to Missouri law. HDR recommends that the City have its legal counsel review the tap fees for water as set forth in this report to ensure compliance with Missouri law.

Summary

The water tap fees presented in this report are based on the planning and engineering design criteria of the City's water system, the value of the existing assets, past financing of system infrastructure, and generally accepted principles.

The calculated tap fees will provide multiple benefits to the City and will continue the practice of establishing equitable and cost-based water tap fees for new customers connecting to the City's water system.

¹ Principles established in industry documents referenced as System Development Charges for Water, Wastewater, and Stormwater Facilities, by Arthur C. Nelson; and American Water Works Association, M1 Manual, Seventh Edition.



1.0 Introduction and Overview of Tap Fees

1.1 Introduction

The purpose of tap fees is to fund an equitable and proportionate share of capital costs for the City's water system related to providing the necessary capacity to serve new customers. The objective of the analysis is to calculate the cost-based charges for new customers connecting to, or requesting additional capacity on, the City's water system. By establishing cost-based tap fees, the City has growth-pay-for-growth by having new customers pay their share of the infrastructure in place which will serve them, while also capturing the value of the portion existing customers have paid for funding the available capacity in the existing system, thereby shielding existing customers from the financial impacts of growth.

General industry recommendations are to adjust these charges annually based on changes in construction costs, and to update the charges every five years, or when comprehensive planning documents for the system have been updated. The water tap fees were recently updated by City staff as of July 1, 2022, however the methodology has not been reviewed since 1996. A review of the tap fees is prudent at this time to determine parity between existing and new City customers. This report resulted in similar water tap fees as the July 1, 2022 fees.

1.2 Defining Water Tap fees

The first step in establishing cost-based tap fees, sometimes referred to as system development charges (SDC), is to gain a better understanding of the definition of a SDC or tap fee². For the purposes of this analysis, a tap fee (or system development charge) is defined as follows:

"System development charges are one-time charges paid by new development to finance construction of public facilities needed to serve them."³

Tap fees are generally imposed as a condition of service. The objective of a tap fee is not to generate revenue for the utility, but to create a fiscal balance between existing customers and new customers. In this way, all customers seeking to connect to the utility's system bear an equitable share of the cost of capacity that is invested in both the existing and any future growth-related expansions. Through the implementation of equitable and cost-based tap fees, existing customers will not be burdened with the cost of new development (e.g., system expansion). If cost-based tap fees are not implemented, then existing utility customers will bear (i.e., pay for) a greater proportion of the costs associated with new development. Ultimately, the adoption of the final tap fees is a policy decision by the City Council regarding the sharing of costs between new development and existing customers. The adoption of a cost-based tap fees moves towards a proportional balance of growth pays for growth approach.

² System development charges and tap fees are used interchangeably in this section of the report. System development charges are a more common term for these types of charges.

³ Arthur C. Nelson, System Development Charges for Water, Water, and Stormwater Facilities, Lewis Publishers, New York, 1995, p. 1,

1.3 Requirement Under Missouri State Law

In establishing tap fees, an important requirement is that they be developed and implemented in conformance with State and local laws. Missouri does not currently have specific legislation on tap fees. However, industry standards throughout other states is the basic principle that needs to be followed is that the tap fee be based on a proportionate share of the costs of the system required to provide service and that the requirements for adoptions and accounting be followed in compliance with state law.

1.4 Methodology to Development of Tap fees

There are various approaches that can be used to establish tap fees which ultimately depend on the available capacity in the utility (i.e., ability to meet future customer demands). The American Water Works Association (AWWA), M1 Manual, Seventh Edition discusses three generally accepted tap fees methods:

- The *buy-in method*, is based on the value of the existing system’s capacity. This method is typically used when the existing system has sufficient capacity to serve new development now and into the future.
- The *incremental cost method*, is based on the value or cost to needed to add to the existing system to serve additional customers. This method is typically used when the existing system has limited or no capacity to serve new development now and into the future.
- The *combined approach* is based on a blended value of both the existing and future costs needed to serve a new customers. This method is typically used where some capacity is available in the existing system, but future projects are needed in other parts (e.g., wastewater lift station) to serve new development at some point in the future.

The “combined approach” was used for the City’s water tap fee calculation. The water system has specific expansion needs to serve new customers. Therefore, the combined approach is the approach that best fits the City’s expansion of facilities given the impacts of growth outlined in the Master Plan. Therefore, the existing and future component cost per ERU is determined, and the cost per ERU for each existing and future component is added together for a combined total.

Within the generally accepted capacity charge methodologies⁴, there are a number of different steps used to establish cost-based and equitable tap fees. These steps are as follows:

- Step 1** - Determination of system planning criteria
- Step 2** - Determination of equivalent residential units (ERUs)
- Step 3** – Valuation of system component costs
- Step 4** - Determination of any credits

Step 1 – Determination of System Planning Criteria

⁴ Methodologies established in industry documents referenced as System Development Charges for Water, Wastewater, and Stormwater Facilities, by Arthur C. Nelson; AWWA M-1 Manual, 7th Edition.

The first step in establishing tap fees is the determination of the system planning criteria. This implies calculating the amount of capacity required by a single-family residential customer. The use of an adopted facility plan or master plan for the utility provides the basis for the capacity charge system planning criteria. These planning documents provide the rational planning basis and criteria for the facilities and investment needed to operate and maintain the system properly and adequately. Generally, for a water system the planning criterion is the is the peak day demand in gallons average flow per ERU. The City’s standard specifications and Capital Improvement Plan resulting from the recent Master Plan are the documents and information that are referenced for the determination of the system planning criteria.

Step 2 – Determination of Equivalent Residential Unit (ERU)

The next step is the determination of the ERUs. An ERU provides a “common denominator” for assessing impact on a utility system. The determination of the total system ERUs is an important calculation in that it provides the linkage between the amounts of infrastructure necessary to provide service to a set number of customers. This implies that if the system is designed to provide service for demands up to the year 2032, then the infrastructure costs are divided by the total ERUs projected to be connected by 2032 to determine the equitable and proportionate cost per ERU.

Step 3 – Valuation of System Component Costs

Once the number of ERUs, or capacity components are determined, a component by component analysis is undertaken to determine the portion of the capacity charge attributable to each component in dollars per ERU. In this process, the existing assets must be valued. Existing assets may be valued in a number of different ways. These methods may include the following:

- Original Cost (OC) is cost of construction in year of construction
- Original Cost Less Depreciation (OCLD)
- Replacement Cost New (RCN) is current day dollars of replacing existing
- Replacement Cost New Less Depreciation (RCNLD)

Given these four different methods for valuing the assets, the selection of the valuation method certainly arises. The American Water Works Association M-1 manual notes the following concerning these various generally accepted valuation methods:

“Using the OC and OCLD valuations, the [capacity charge] reflects the original investment in the existing capacity. The new customer “buys in” to the capacity at the OC or the net book value cost (OCLD) for the facilities and as a result pays an amount similar to what the existing customers paid for the capacity (OC) or the remaining value of the original investment (OCLD).

Using the RCN and the RCNLD valuations, the [capacity fee] reasonably reflects the cost of providing new expansion capacity to customers as if the capacity was added at the time the new customers connected to the water system. It may be also thought of as a valuation method to fairly compensate the existing customers for the carrying costs of the excess capacity built into the system in advance of when the new customers connect to the system. This is because, up to the point of the new customer connecting to the

system, the existing customers have been financially responsible for the carrying costs of that excess capacity that is available to development.”⁵

As a point of reference for this study, the City’s tap fee analyses will use a RCN methodology for all assets in the study. The City’s existing assets are valued at “replacement” cost based on original cost escalated to current dollars using a cost index (i.e., the Engineering New Record, Construction Cost Index, or ENR-CCI). This value reasonably reflects the carrying costs of the excess capacity paid by existing customers.

The next step in the analysis is to determine the valuation of the system infrastructure. The combined approach is based on the existing infrastructure plus future expansion-related capital projects, based on an adopted capital plan or master plan and valued at today’s cost, regardless of the timing of when the facility will be built. The future component is related only to future capital projects which provide an expansion of capacity to accommodate future growth.

Given a value for capacity and the number of ERU capacity units, the basic formula for calculating the tap fee charge is relatively straight-forward, and is as follows:

$$\frac{\text{Existing Investment (\$)}}{\text{Total ERUs}} + \frac{\text{Future CIP (\$)}}{\text{Future ERUs}} = \text{Maximum Allowable Tap Fee \$ per ERU}$$

In the determination of the tap fee, the cost per ERU as shown above is the “gross tap fee”. The “gross tap fee” is calculated before any credits.

Step 4 – Determination of Any Credits

The last step in the calculation of the tap fee is the determination of any credits. The credit considers the method used to finance infrastructure on the system so that customers are not paying twice for infrastructure – once through the tap fees and again through rates. The double payment can come in through the imposition of a tap fee and then the requirement to pay debt service within a customer’s water rates.

This component accounts for the outstanding debt principal on existing assets. By segregating the debt service out, the cost can be clearly identified and calculated appropriately. To avoid double-counting of the assets financed with debt, the future principal associated with those assets is deducted from the existing infrastructure value.

1.5 Summary

This section of the report has defined tap fees; provided an overview of the requirements under state law, the tap fee approach which must be established between new development and the new or expanded facilities required to accommodate new development, and appropriate apportionment of the cost to the new development in relation to benefits reasonably to be received. The next section of the report will provide a discussion of the calculation of the City’s water tap fees.

⁵ Ibid., p. 332.

2.0 Development of the Water Tap Fees

2.1 Introduction

This section of the report presents the key assumptions and details used in calculating the City's water tap fees. The calculation of the City's water tap fees is based on City-specific accounting and planning information. Specifically, the charges are based upon the City's fixed asset records; the City's current capital improvement plans; existing equivalent residential units (ERUs) and projection of future ERUs. This was based on a total system wide basis.

To the extent that the cost and timing of future capital improvements change, the tap fees presented in this section of the report should be updated to reflect these changes.

2.2 Existing Water Tap Fee

The City's existing water tap fee is based on the number of drains. The City's existing water tap fees is shown below in Table 2 - 1.

**Table 2-1
Current Water Tap Fees**

Meter Size	Meter Type	Meter Capacity ⁽¹⁾ (gpm)	Capacity Multiplier ⁽²⁾ (CM)	Current Tap Fee ⁽³⁾
5/8" x 3/4"	Displacement	15	1.0000	\$3,730
3/4"	Displacement	25	1.6676	6,215
1"	Displacement	40	2.6676	9,945
1 1/2"	Displacement	50	3.3338	12,435
2"	Displacement	100	6.6676	24,865
2"	Compound	160	10.6676	39,785
3"	Compound	320	23.3338	79,575
4"	Compound	500	40.0000	124,335
6"	Compound	1,000	83.3338	248,665
8"	Compound	1,600	120.0000	397,865
10"	Compound	2,300	153.3338	571,935

(1) AWWA M6 Water Meters – Selection, Installation Testing and Maintenance 1999, Table 5-3, p 54-55.

(2) Capacity Multiplier (CM) = meter capacity relative to a 5/8 x 3/4" displacement type meter.

(3) Current water tap fee as of July 1, 2022.

As can be seen in Table 2-1, the current tap fee for a 5/8" x 3/4" is \$3,730.

2.3 Calculation of the Water Tap Fees

As discussed in Section 1, the process of calculating tap fees is based on a four-step process. In summary form, these steps are as follows:

- Determination of system planning criteria
- Determination of equivalent residential units (ERUs)

- Calculation of the tap fee by system component costs
- Determination of tap fee credits

Each of these steps is discussed in more detail below.

2.3.1 Water System Planning Criteria

System planning criteria typically involves calculating the amount of water demand required by a single-family residential customer. The peak water demand represents the basis for system design. The City defines 221 average gallons per day per ERU, with a maximum day multiplier of 2.2, for a maximum day equivalent unit consumption of 486 gallons per day per ERU (221 x 2.2 = 486).

The total purchase contract maximum, including the additional 8 MGD from Kansas City Phase IV is 40.50 MGD, less reserve for fire protection of 2 MGD is a total water available of 38.50 MGD. The future upsizing for transmission and distribution system is 15.67 MGD. The storage capacity is 440 gallons per day per ERU. Further details can be found in Exhibit 1 of the Technical Appendix. A summary of the system criteria for water is presented in Table 2-2.

Table 2-2 Water Tap Fee – Planning Criteria	
Description	Total
Average Equivalent Unit Consumption (gallons per day/ERU)	221
Max Day Multiplier	<u>2.2</u>
Max Day Equivalent Unit Consumption⁽¹⁾ (gallons per day /ERU)	486
Existing Water Capacity in MGD⁽²⁾	38.50 MGD
Future Upsizing Transmission/Distribution System	15.67 MGD
Storage Capacity in gallons per day / ERU⁽³⁾	440

(1) The maximum day equivalent unit consumption per Memo Oct. 29, 2021, Water Master Plan Demand Projections.

(2) The total water purchase contract maximum provided by the City including Kansas City Phase IV and less reserve for fire protection.

(3) Total storage capacity from Water System Plan.

2.3.2 Water Equivalent Residential Units

System planning criteria are used to establish the capacity needs of an equivalent residential unit (ERU). The maximum day equivalent unit consumption is 486 gallons per day per ERU. The existing water capacity in MGD is 38.50 or ERUs of 79,186 (38.50/486 gallons per day = 79,186 ERUs).

The future capacity of the upsizing of transmission and distribution to serve the 38.50 MGD water capacity is 15.67 MGD. This is approximately 32,227 ERUs or 40.7% (of the 79,186 ERUs as growth

or upsizing related (32,227/79,186 = 40.7%). A summary of the existing and future ERUs is presented in Table 2-3.

Description	Water Capacity in MGD	Maximum Day Equivalent Unit Consumption gallons per ERU	Total ERUs ^[2]	% Growth
Existing Water Capacity ERUs ⁽¹⁾	38.50	486	79,186	
Future Upsizing Trans./Distib.	15.67	486	32,227	40.7%
Existing Storage	34.85	440	79,186	
Future Storage	6.00	440	13,633	

[1] Existing ERUs based on available capacity and peak demand in gallons per ERU.

[2] Future ERUs based on capacity upsizing for trans./distr. and maximum day equivalent unit consumption.

The next step of the analysis is to review the major functional system infrastructure to determine the tap fee for the system. In calculating the tap fees for the City, existing components, debt service for existing facilities, and future capital improvements relating to expansion to meet new growth (demands) were included. The methodology used to calculate each of these components is described below.

2.3.3 Water Tap Fee

EXISTING OR BUY-IN COMPONENT – To calculate the value of the existing assets for the buy-in component, the City’s methodology considered the original cost of each asset. The original cost of the asset was then adjusted to the value for replacement cost. City staff and HDR reviewed the existing assets and included only the recent backbone portion of infrastructure. The asset and their installation dates were escalated to current, November 2022 dollars, based on the Construction Cost Index (CCI) for the 20-City average area published in the City Engineering News & Record (ENR). The valuation of the existing assets can be seen on Exhibit 2 of the Technical Appendix.

DEBT SERVICE COMPONENT - This inclusion of a “debt service credit” avoids double charging the customer for the asset value in the existing or buy-in component of the tap fee, and also in the debt service component of the rates. The principal portion of the debt service balance on existing assets is removed from the value prior to calculating the buy-in portion of the fee. By segregating the debt service out, the cost can be clearly identified and calculated appropriately. At the current time, the City water does not have any existing outstanding debt.

FUTURE COMPONENTS – An important requirement for a tap fee study is the connection between the anticipated future growth on the system and the needed facilities required to accommodate that growth. For purposes of this study, the City’s Master Plan Capital Improvement Plan (CIP) which included capacity related projects. City staff reviewed the CIP and updated it with current project assumptions and available information. The projects necessary to meet demand for the

water system were included in the CIP, along with a projection of the percentage of capacity eligible projects. The CIP detailed projects of \$76.7 million of which \$66.0 million were directly tap fee eligible. Exhibit 5 of the Technical Appendix contains the details of this portion of the fee.

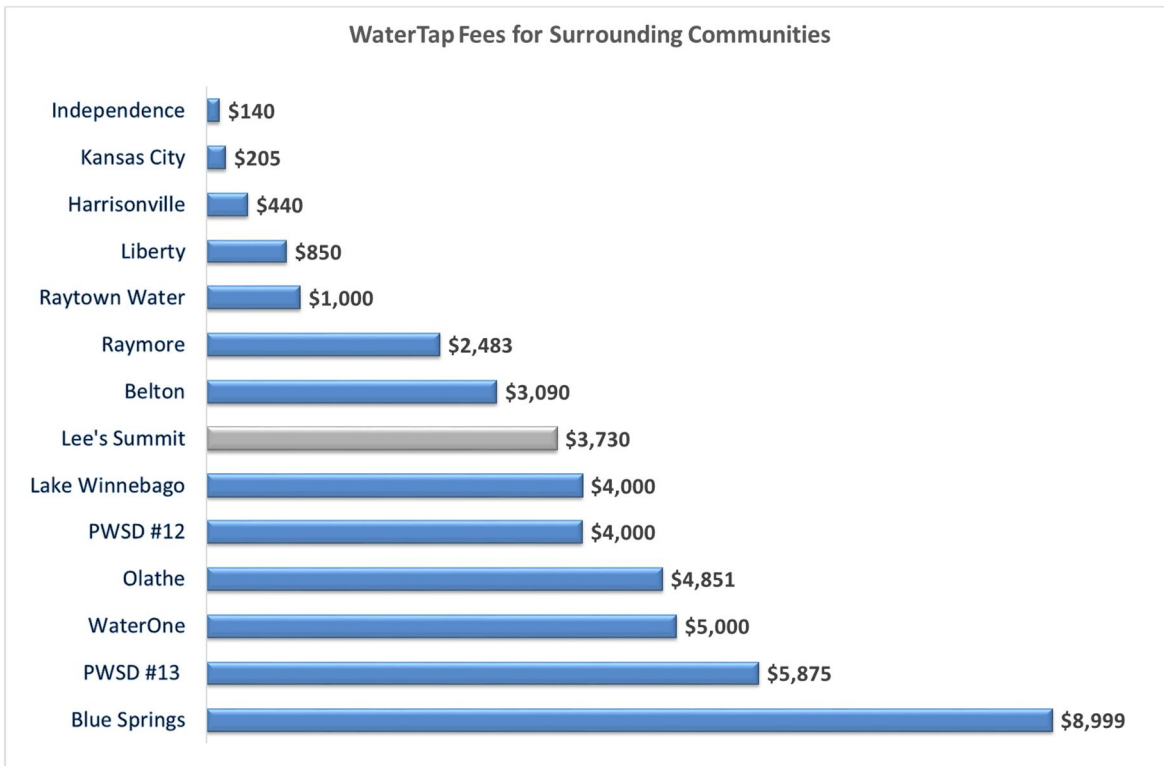
2.3.4 Allowable Water Tap Fee

Based on the sum of the component costs calculated above, the allowable water tap fee were determined. “Allowable” refers to the concept that the calculated tap fees are the City’s cost-based water tap fees. The City, as a matter of policy, may charge any amount up to the allowable capacity charge, but not over that amount. Charging an amount greater than the allowable tap fee would not meet the practical basis of a cost-based tap fee. The calculated tap fee of \$3,760 which is \$30 increase from the current fee of \$3,730 (based on 5/8” x 3/4” meter). Table 2-4 shows a summary of the allowable water tap fee. Details are provided in Exhibit 6 of the Technical Appendix.

Table 2-4 Maximum Allowable Water Tap Fee				
	\$ RCN	Eligible RCN	ERUs	\$/ERU
Existing (Buy-In)				
Source of Supply	\$77,229,766	\$61,561,461	79,186	\$777
Storage	43,257,339	31,868,732	79,186	402
Trans./Distrib.	<u>3,257,485</u>	<u>1,325,726</u>	79,186	<u>17</u>
Total Buy-In	\$123,744,590	\$94,755,919		\$1,196
Future (Growth)				
Source of Supply	\$16,238,700	\$16,238,700	79,186	\$205
Storage	19,270,000	19,270,000	13,633	1,413
Trans./Distrib.	<u>41,238,000</u>	<u>30,494,823</u>	32,227	<u>946</u>
Total Future	\$76,746,700	\$66,003,523		\$2,564
Total Tap Fee	\$200,491,290	\$160,759,442		\$3,760

2.4 Implementation of the Water Tap Fees

The current tap fees are based on size of the meter. A comparison of the City's current tap fee to other local surrounding water utilities has been developed. Provided in the chart below is a comparison of the City's current tap fee .



As can be seen in the above graph, the City's current tap fee of \$3,730 is in the middle of the scale and the calculated tap fee, increased by \$30, at \$3,760 would keep the City's fee in the middle of the scale.

**Table 2-5
Current and Proposed Water Tap Fees**

Meter Size	Meter Type	Meter Capacity ⁽¹⁾ (gpm)	Capacity Multiplier ⁽²⁾ (CM)	Current Tap Fee ⁽³⁾	Calculated Tap Fee
5/8" x 3/4"	Displacement	15	1.0000	\$3,730	\$3,760
3/4"	Displacement	25	1.6676	6,215	6,270
1"	Displacement	40	2.6676	9,945	10,030
1 1/2"	Displacement	50	3.3338	12,435	12,535
2"	Displacement	100	6.6676	24,865	25,070
2"	Compound	160	10.6676	39,785	40,110
3"	Compound	320	23.3338	79,575	80,220
4"	Compound	500	40.0000	124,335	125,350
6"	Compound	1,000	83.3338	248,665	250,695
8"	Compound	1,600	120.0000	397,865	401,115
10"	Compound	2,300	153.3338	571,935	576,600

(1) AWWA M6 Water Meters – Selection, Installation Testing and Maintenance 1999, Table 5-3, p 54-55.

(2) Capacity Multiplier (CM) = meter capacity relative to a 5/8 x 3/4" displacement type meter.

(3) Current water tap fee as of July 1, 2022.

2.5 Key Assumptions

In developing the tap fees for the City’s water systems, a number of key assumptions were utilized. These are as follows:

- The City’s tap fees were developed on the basis of planning documents, anticipated future connections and the needed capital improvements to serve those future connections.
- The City’s asset records as of June 2022 were used to determine the existing infrastructure assets.
- The City projections of future capital infrastructure and ERUs was based on the City Capital Program for 2022 to 2032.
- The City determined the portion of future improvements that were growth-related.
- The CIP is in 2022 dollars and is the basis for the CIP.

2.6 Consultant’s Recommendations

Based on our review and analysis of the City’s water tap fees, HDR makes the following recommendations:

1. The City should adopt the water tap fees for new connections which are no greater than the net allowable water tap fees as set forth in this report
2. The City should annually update the water tap fees by a local construction cost index such as the Engineering News Record Construction Cost Index (ENR-CCI) for no more than five years before a complete update of the water tap fees is completed. Industry best practice of annual inflationary adjustment can keep the tap fees (water system infrastructure investment) relatively current with construction pricing practices.

3. The City should update the actual calculations for the water tap fees at such time when a new capital improvement plan, public facilities plan, comprehensive system plan, or a comparable plan is approved or updated by the City, or every five years.

2.7 Summary

The water tap fees developed and presented in this report are based on the planning and engineering design criteria of the City's water system, the value of the existing assets, and generally accepted rate and fee principles. Consistently updating the fee quarterly based on the Engineering New Record cost index and reviewing the tap fees every five years will continue to create equitable and cost-based charges for new customers connecting to the City's water system.



Technical Appendix

City of Lee's Summit
 Exhibit 1
 Water Tap Fee - 2023
 Water Tap Fee Development of ERUs

ERU = Equivalent residential unit

Average Equivalent Unit Consumption	221 average gallons per day/ERU
Max Day Multiplier	2.2
Max Day Equiv. Unit Consumption ^[1]	486 peak gallons per day/ERU
Storage Capacity ^[2]	440 gallons per day/ERU
Water Purchase Contract Maximums (mgd) ^[3]	mgd
Independence	7.50
Kansas City	8.50
Jackson Cass Transmission	
Kansas City Phase I	5.50
Kansas City Phase III	6.00
Harrisonville Buyout	5.00
Kansas City Phase IV	8.00
Total Water Purchase Contract Maximums (mgd)	40.50
Less: Reserve for Fire Protection	(2.00)
Total Water Available (mgd)	38.50
Total ERUs	
Existing Capacity (mgd)	38.50
Max Day Equiv. Unit Consumption	486
Total Existing ERUs	79,186 100.0%
Future Capacity (mgd)	15.67
Max Day Equiv. Unit Consumption	486
Total Future ERUs	32,227 40.7%
Total Water Available (mgd)	38.50
Max Day Equiv. Unit Consumption	486
Total ERUs	79,186

Notes:

[1] The maximum day equivalent unit consumption per Memo Oct. 29, 2021, Water Master Plan Demand Projections.

[2] The total storage capacity from Water System Plan.

	mg
1961 Harris Park Standpipe	2.15
1970 High Service - Below Ground	4.00
1979 High Service - Above Ground	5.50
1980 Bowlin Reservoir	5.50
1990 Ranson Tower	2.50
1998 Woods Chapel Tower	2.50
2000 Scherer Tower	3.00
2001 South Terminal Reservoir	6.70
2005 Hook Tower	3.00
Total Storage	34.85
Total ERUs	79,186
Total storage gallons per ERU/day	440.10

[3] The total water purchase contract maximum provided by the City.

City of Lee's Summit
 Exhibit 2
 Water Tap Fee - 2023
 Water Tap Fee Source of Supply Facilities

ENR-20 City CCI
 11/1/2022
 12,992

Year	Equipment List	Original Cost	ENR-CCI of Year Built	2022 Cost ^[1]	% Tap Fee Eligible	\$ Tap Fee Eligible
Existing Source of Supply						
6/30/1984	LITTLE BLUE RD PUMP STATION	13,711	3.13	42,964	0.0%	0
6/30/1986	NEGOTATION W/MO WATER CO.	17,191	3.02	51,999	0.0%	0
7/30/1986	WATER PURCHASE AGREEMENT	1,000,000	3.02	3,024,809	0.0%	0
6/30/1992	HYDRAULIC ANALYSIS	99,604	2.61	259,581	0.0%	0
2/28/1995	WATERLINE-SUPERSTATION	5,003,850	2.37	11,882,252	0.0%	0
6/30/2002	KC Supply Proposal S Terminal	12,254,626	1.99	24,350,974	100.0%	24,350,974
6/30/2003	Water Master Plan (from 37036)	\$190,557	1.94	\$369,828	0.0%	\$0
6/30/2003	KC Supply - Segment 4	13,870,685	1.94	26,919,897	100.0%	26,919,897
6/30/2006	S Terminal Pump Station	21,831	1.68	36,590	0.0%	0
6/30/2007	South Terminal addition	173	1.63	282	0.0%	0
6/30/2012	KC Supply Proposal - III	4,027,746	1.40	5,621,602	100.0%	5,621,602
6/30/2022	KC Supply Proposal - III (Final Payout)	4,488,165	1.00	4,488,165	100.0%	4,488,165
6/30/2022	Tri-County Water Authority - Connections	180,824	1.00	180,824	100.0%	180,824
Total Existing Source of Supply		\$41,168,963		\$77,229,766		\$61,561,461
Design capacity of Existing System in mg ^[2]						38.50
Cost per Gallon						\$1.60
Peak Day use per ERU ^[3]						486
Existing Source of Supply Water Tap Fee per ERU						\$777
Future Supply ^[4]						
3/31/2028	KC Supply - Harrisonville	\$4,455,700	1.00	\$4,455,700	100.0%	\$4,455,700
6/30/2027	KC Supply - Phase IV	\$11,783,000	1.00	11,783,000	100.0%	11,783,000
Total Future Source of Supply		\$16,238,700		\$16,238,700		\$16,238,700
Design capacity of Existing System in mg ^[2]						38.50
Cost per Gallon						\$0.42
Peak Day use per ERU ^[4]						486
Future Source of Supply Water Tap Fee per ERU						\$205
Total Source of Supply Water Tap Fee per ERU						\$982

Notes:

- [1] The cost is the replacement cost, based on the Engineering News Record construction cost index (ENR-CCI) 20-cities applied to original cost. Nov 2022 Engineering News Record, Construction Cost Index (ENR-CCI) for 20-City average.
- [2] Total capacity of existing source of supply is 38.50 mg. See Exhibit 1.
- [3] Peak day use based on City data. See Exhibit 1.
- [4] Total future projects based on capital improvement plan. See Exhibit 5.

City of Lee's Summit
 Exhibit 3
 Water Tap Fee - 2023
 Water Tap Fee for Storage Facilities

ENR-20 City CCI
 11/1/2022
 12,992

Year	Equipment List	Original Cost	ENR-CCI of Year Built	2022 Cost ^[1]	% Tap Fee Eligible	\$ Tap Fee Eligible
Existing Storage Facilities						
6/30/1918	WATER TANK, 75000 GALLON (6/30/1918)	5,000	68.74	343,692	0.0%	0
6/30/1950	RESERVOIR, UNDERGROUND (6/30/1950)	90,000	25.47	2,292,628	0.0%	0
6/30/1960	WATER TANK, 2,000,000 GALLON	124,841	15.77	1,968,300	0.0%	0
10/30/1971	RESERVOIR, UNDERGROUND	462,752	8.22	3,802,573	100.0%	3,802,573
6/30/1980	RESERVOIR, CHIPMAN/DOUGLAS	832,363	4.01	3,340,652	100.0%	3,340,652
6/30/1985	HIGH SERVICE PIPING IMPROV	152,274	3.10	471,580	0.0%	0
6/30/1986	BOWLING ROAD PHASE 2	16,936	3.02	51,228	0.0%	0
6/30/1986	BLUE SPRINGS RESERVOIR WATER	135,963	3.02	411,262	0.0%	0
8/31/1986	WATER SYS. IMPROVEMENTS, HIGH	20,233	3.02	61,201	0.0%	0
5/30/1992	ELEVATED STORAGE TANK 2M GALS	1,775,229	2.61	4,626,477	100.0%	4,626,477
6/30/1993	PUMP STATION HARRIS PARK	80,010	2.49	199,510	0.0%	0
8/1/1994	PUMP STATION -DOUGLAS RD	285,467	2.40	685,773	0.0%	0
8/1/1994	PUMP STATION-LS RD/UNITY	512,684	2.40	1,231,613	0.0%	0
6/30/1997	5.5 MG Storage Tank Recoating	109,164	2.23	243,428	0.0%	0
8/1/1999	N Elevated Water Storage Tank	2,859,034	2.14	6,130,270	100.0%	6,130,270
6/30/2003	5.5mg Storage Tank Recoat	32,853	1.94	63,760	0.0%	0
6/30/2003	Scherer Road Elevated Tank	3,084,737	1.94	5,986,785	100.0%	5,986,785
6/30/2005	5.5mg Storage Tank Recoat	13,635	1.74	23,790	0.0%	0
6/30/2005	Ranson Rd Painting	296,421	1.74	517,188	0.0%	0
6/30/2006	S Terminal Pump Station	21,831	1.62	35,362	0.0%	0
6/30/2007	South Elevated tank	318,112	1.63	518,719	0.0%	0
6/30/2007	South Terminal addition	173	1.58	273	0.0%	0
6/30/2008	S. Elevated Tank	1,407	1.56	2,199	0.0%	0
6/30/2008	S. Elevated Tank	4,038,177	1.56	6,312,292	100.0%	6,312,292
6/30/2009	S. Elevated Tank	446	1.52	676	0.0%	0
6/30/2009	S. Elevated Tank	18,000	1.52	27,271	0.0%	0
6/30/2009	S Term 36" Transmission Line	91,438	1.52	138,535	0.0%	0
6/30/2012	S Term 36" Transmission Line	397	1.40	553	0.0%	0
6/30/2020	High Service Tank Rehab	1,853,403	1.13	2,100,065	0.0%	0
6/30/2022	South Terminal Discharge Main	1,669,682	1.00	1,669,682	100.0%	1,669,682
		\$18,902,661		\$43,257,339		\$31,868,732
Capacity (MG) ^[2]						34.85
Cost per Gallon						\$0.91
Storage Requirement per ERU ^[3]						440
Existing Storage Facilities Water Tap Fee per ERU						\$402
Future Storage ^[4]						
6/30/2035	Low Head Storage	\$19,270,000	1.00	\$19,270,000	100.0%	\$19,270,000
Total Future Storage Facilities		\$19,270,000		\$19,270,000		\$19,270,000
Capacity (MG) [2]						6.00
Cost per Gallon						\$3.21
Storage Requirement per ERU ^[3]						440
Future Storage Facilities Water Tap Fee per ERU						\$1,413
Total Storage Facilities Water Tap Fee per ERU						\$1,815

Notes:

- [1] The cost is the replacement cost, based on the Engineering News Record construction cost index (ENR-CCI) 20-cities applied to original cost. Nov 2022 Engineering News Record, Construction Cost Index (ENR-CCI) for 20-City average.
- [2] Total capacity of existing storage is 34.85 mg. See Exhibit 1.
- [3] Storage requirement per ERU based on City data. See Exhibit 1.

Exhibit 4

Water Tap Fee - 2023

Water Tap Fee for Transmission/Distribution System

ENR-20 City CCI

11/1/2022

12,992

Year	Equipment List	Original Cost	ENR-CCI of Year Built	2022 Cost ^[1]	% Tap Fee Eligible	\$ Tap Fee Eligible
Existing Transmission/Distribution System						
6/30/2010	Hwy M-150 - Stoney Creek Dr to City Limits	422,099	1.48	622,981	40.7%	253,540
6/30/2016	Blackwell Road & US 50 Hwy Interchange	422,468	1.26	530,866	40.7%	216,051
6/30/2019	US 50 Hwy - Blackwell to Smart	391,083	1.15	450,370	40.7%	183,291
6/30/2019	US 50 Hwy - Smart to Harris	464,829	1.15	535,296	40.7%	217,854
6/30/2019	Gateway Drive - Delta Sch/Georgian	88,387	1.15	101,786	40.7%	41,425
6/30/2020	Harris Rd - Herring to Haines	69,000	1.13	78,183	40.7%	31,819
6/30/2020	Pryor Rd- Longview Rd to Hook Rd	200,436	1.13	227,111	40.7%	92,429
6/30/2020	Commerce Drive - Tudor to Main	15,852	1.13	17,962	40.7%	7,310
6/30/2022	Sampson Rd - Ext to Hook	581,444	1.00	581,444	40.7%	236,635
6/30/2022	US 50 Hwy - Harris to Woodlawn	111,486	1.00	111,486	40.7%	45,372
Total Existing Transmission and Distribution System		\$2,767,083		\$3,257,485		\$1,325,726
Total ERUs ^[2]						79,186
Existing Transmission/Distribution Plant Water Tap Fee per ERU						\$17
Future Transmission/Distribution System ^[3]						
6/30/2031	SE System Improvements - Hamblen	2,739,000	1.00	2,739,000	100.0%	2,739,000
6/30/2032	SE System Improvements - 291 to Hamblen	2,584,000	1.00	2,584,000	100.0%	2,584,000
6/30/2024	Colbern Rd - US350 to Douglas	1,226,000	1.00	1,226,000	100.0%	1,226,000
6/30/2030	Hook Road - Tower to 291	6,110,000	1.00	6,110,000	100.0%	6,110,000
6/30/2024	Pryor Road (Scherer to Longview)	1,925,000	1.00	1,925,000	100.0%	1,925,000
6/30/2033	NE System Improvements - Todd George Rd (Colbern to Strother)	4,825,000	1.00	4,825,000	100.0%	4,825,000
6/30/2035	NE System Improvements - Todd George Rd (Strother/Woods)	3,713,000	1.00	3,713,000	100.0%	3,713,000
6/30/2024	Water Main – View High Longview Golf to Chipman Upsize	337,000	1.00	337,000	40.7%	137,152
6/30/2024	Water Main - Lakewood Way - Ridgewood to Bowlin Rd Upsize	466,000	1.00	466,000	40.7%	189,652
6/30/2024	Water Main - Milton Thompson and Langsford Upsize	1,320,000	1.00	1,320,000	40.7%	537,212
6/30/2026	Upsizing (5 year estimate)	2,705,000	1.00	2,705,000	40.7%	1,100,877
6/30/2033	Upsizing (10 year estimate)	4,987,000	1.00	4,987,000	40.7%	2,029,602
6/30/2043	Upsizing (20 year estimate)	8,301,000	1.00	8,301,000	40.7%	3,378,329
Total Future Transmission/Distribution System		\$41,238,000		\$41,238,000		\$30,494,823
Future ERUs ^[2]						32,227
Future Transmission/Distribution System Water Tap Fee per ERU						\$946
Total Transmission/Distribution Water Tap Fee per ERU						\$963

Notes:

[1] The cost is the replacement cost, based on the Engineering News Record construction cost index (ENR-CCI) 20-cities applied to original cost. Jan 2022 Engineering News Record, Construction Cost Index (ENR-CCI) for 20-City average.

[2] Total ERUs (existing and future) based on City data. See Exhibit 1.

[3] Total future projects based on capital improvement plan. See Exhibit 5.

City of Lee's Summit
 Exhibit 5
 Water Tap Fee - 2023
 Summary of Capital Improvement Plan

ENR-20 City CCI
 11/1/2022
 12,992

	Prior Yrs	Current CIP	2024	2025	2026	2027	2028	2029	2030	2031	2032	Future	Total Project Cost	% Growth Related [2]	2022	Total Growth Related
Capital Improvement Projects ^[1]	CWIP 2022	CWIP 2023														
Water Source of Supply																
KC Supply - Harrisonville	\$3,107,264	\$234,511	\$234,510	\$234,510	\$234,510	\$234,510	\$175,883	\$0	\$0	\$0	\$0	\$0	\$4,455,700	100.0%	1.00	\$4,455,700
KC Supply - Phase IV	0	0	0	734,000	0	0	11,049,000	0	0	0	0	0	11,783,000	100.0%	1.00	11,783,000
Total	\$3,107,264	\$234,511	\$234,510	\$968,510	\$234,510	\$234,510	\$11,224,883	\$0	\$0	\$0	\$0	\$0	\$16,238,700			\$16,238,700
Water Storage																
Low Head Storage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,270,000	\$19,270,000	100.0%	1.00	\$19,270,000
Total	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,270,000	\$19,270,000			\$19,270,000
Transmission																
SE System Improvements - Hamblen	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,739,000	\$2,739,000	100.0%	1.00	\$2,739,000
SE System Improvements - 291 to Hamblen	0	0	0	0	0	0	0	0	0	315,000	2,269,000	0	2,584,000	100.0%	1.00	2,584,000
Colbern Rd - US350 to Douglas	149	999,851	226,000	0	0	0	0	0	0	0	0	0	1,226,000	100.0%	1.00	1,226,000
Hook Road - Tower to 291	0	0	0	0	0	0	0	702,000	5,408,000	0	0	0	6,110,000	100.0%	1.00	6,110,000
Pryor Road (Scherer to Longview)	0	1,925,000	0	0	0	0	0	0	0	0	0	0	1,925,000	100.0%	1.00	1,925,000
NE System Improvements - Todd George Rd (Colbern to Strother)	0	0	0	0	0	0	0	0	0	0	0	0	4,825,000	100.0%	1.00	4,825,000
NE System Improvements - Todd George Rd (Strother/Woods)	0	0	0	0	0	0	0	0	0	0	0	0	3,713,000	100.0%	1.00	3,713,000
Total	\$149	\$2,924,851	\$226,000	\$0	\$0	\$0	\$0	\$702,000	\$5,408,000	\$315,000	\$2,269,000	\$11,277,000	\$23,122,000			\$23,122,000
System Upsizing																
Water Main – View High Longview Golf to Chipman Upsize	\$0	\$227,800	\$109,200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$337,000	40.7%	1.00	\$137,152
Water Main - Lakewood Way - Ridgewood to Bowlin Rd Upsize	0	0	466,000	0	0	0	0	0	0	0	0	0	466,000	40.7%	1.00	189,652
Water Main - Milton Thompson and Langsford Upsize	0	495,000	825,000	0	0	0	0	0	0	0	0	0	1,320,000	40.7%	1.00	537,212
Upsizing (5 year estimate)	0	0	0	0	0	0	2,705,000	0	0	0	0	0	2,705,000	40.7%	1.00	1,100,877
Upsizing (10 year estimate)	0	0	0	0	0	0	0	0	0	0	0	4,987,000	4,987,000	40.7%	1.00	2,029,602
Upsizing (20 year estimate)	0	0	0	0	0	0	0	0	0	0	0	8,301,000	8,301,000	40.7%	1.00	3,378,329
Total	\$0	\$722,800	\$1,400,200	\$0	\$0	\$0	\$2,705,000	\$0	\$0	\$0	\$0	\$13,288,000	\$18,116,000			\$7,372,823
Total Water System Plan	\$3,107,413	\$3,882,162	\$1,860,710	\$968,510	\$234,510	\$234,510	\$13,929,883	\$702,000	\$5,408,000	\$315,000	\$2,269,000	\$43,835,000	\$76,746,700			\$66,003,523

Notes:
 [1] Based on City Capital Program 2022-2032. Construction work in progress for 2021 and 2022 are completed but not included in assets yet therefore are included here. CIP in 2022 \$.
 [2] Growth related eligible future projects based on City input. See Exhibit 1.

City of Lee's Summit

Exhibit 6

Water Tap Fee - 2023

Summary of Water Tap Fee Calculation

	Current Fee	Tap Calculated Fee	Tap Change
Calculated WTF: 5/8" x 3/4" Displacement	\$3,730	\$3,760	\$30

Water Tap Fee Calculation Results			
	Existing	Future	Total ¹
Source of Supply	\$777	\$205	\$982
Storage	402	1,413	1,815
Transmission/Distribution	17	946	963
Total	\$1,196	\$2,564	\$3,760
Net Water Tap Fee	\$1,196	\$2,564	\$3,760
Tap Fee	\$1,196	\$2,564	\$3,760

Meter Size	Meter Type	Meter Capacity ² (gpm)	Capacity Multiplier ³ (CM)	Current Tap Fee ⁴	Calculated Tap Fee	\$ Change
5/8" x 3/4"	Displacement	15	1.0000	\$3,730	\$3,760	\$30
3/4"	Displacement	25	1.6667	6,215	6,270	55
1"	Displacement	40	2.6667	9,945	10,030	85
1 1/2"	Displacement	50	3.3333	12,435	12,535	100
2"	Displacement	100	6.6667	24,865	25,070	205
2"	Compound	160	10.6667	39,785	40,110	325
3"	Compound	320	21.3333	79,575	80,220	645
4"	Compound	500	33.3333	124,335	125,350	1,015
6"	Compound	1,000	66.6667	248,665	250,695	2,030
8"	Compound	1,600	106.6667	397,865	401,115	3,250
10"	Compound	2,300	153.3333	571,935	576,600	4,665

Notes:

1. City does not have any outstanding water debt therefore no debt credit in the calculation.
2. Source for capacity figures:
AWWA M6 Water Meters - Selection, Installation, Testing and Maintenance 1999
Table 5-3, pp 54-55.
3. Capacity Multiplier (CM) = meter capacity relative to a 5/8x3/4" displacement type meter.
Sample calculation for a 3/4" displacement meter: 25/15 = 1.6667
4. Current tap fee as of July 1, 2022.