IN THE TENNESSEE PUBLIC UTILITY COMMISSION
AT NASHVILLE, TENNESSEE

IN RE:	)	Electronically Filed in TPUC Docket Room on March 26, 2026 at 1:36 p.m.
	)	
PETITION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC TO INCREASE CHARGES, FEES AND RATES AND FOR APPROVAL OF A GENERAL RATE INCREASE AND CONSOLIDATED RATES [PHASE 2 INCREASE]	)	**DOCKET NO. 24-00044**

DIRECT TESTIMONY

OF

CLARK D. KAML

March 26, 2025

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I. INTRODUCTION

Q1. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND OCCUPATION FOR THE RECORD.

A1. My name is Clark Kaml. My business address is the Office of the Tennessee Attorney General, John Sevier State Office Building, 500 Dr. Martin L. King Jr. Blvd., Nashville, Tennessee 37243. I am a Financial Analyst employed by the Consumer Advocate Division in the Office of the Tennessee Attorney General (the "Consumer Advocate").

Q2. PLEASE PROVIDE A SUMMARY OF YOUR BACKGROUND AND PROFESSIONAL EXPERIENCE.

A2. I received a Bachelor of Science Degree in Economics from the University of North Dakota in 1987 and a Master of Arts Degree in Economics from the University of North Dakota in 1988. I have more than 30 years of experience working in the regulated utility industries including electric, natural gas, telephone, and water. I have worked for various agencies including the Public Service Commission of North Dakota, the Kansas Corporation Commission, the Minnesota Public Utilities Commission, the Minnesota Office of the Attorney General, and the Grant County Public Utility District. I have worked with private companies, municipalities, and served on a Rate Committee. I served as Co-Chair of the National Association of Regulatory Utility Commissioners ("NARUC") Staff Subcommittee on Strategic Issues, am currently Co-Chair of the National Association of State Utility Consumer Advocates ("NASUCA") Gas Committee, and a member of the GTI Energy Public Interest Advisory Committee. In addition, I am the author of the book

"Don't Fear the Cost Study."[1]

Q3. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY BEFORE THE TENNESSEE PUBLIC UTILITY COMMISSION ("TPUC" OR THE "COMMISSION")?

A3. Yes. I filed testimony in the Tennessee-American Water Company's ("TAWC" or "the Company") recent rate case, TPUC Docket No. 24-00032, the Limestone Water Utility Operating Company's recent rate case, TPUC Docket No. 24-00044, Chattanooga Gas Company's Annual Rate Review, TPUC Docket No. 25-00028, the Kingsport Power Company's Alternative Rate Mechanisms, TPUC Docket No. 25-00022, Piedmont's Annual Rate Review Filing, TPUC Docket No. 25-00036, TAWC's Approval of Merger, TPUC Docket No. 25-00040, Limestone's Petition for Approval of Loan Agreement, TPUC Docket No. 25-00066, Integrated Resources Management's Petition for an Alternative Rate Mechanism, TPUC Docket No. 25-00072, Spire's Petition to purchase Piedmont's Tennessee operations, TPUC Docket No. 25-00074, Two Rivers Utility, LLC Application for a Certificate of Public Convenience and Necessity, TPUC Docket No. 25-00073, TAWC's PFAS Settlement Fund Investigation, TPUC Docket No. 25-00086, and TAWC Petition to adopt an Annual Review Mechanism, TPUC Docket No. 25-00089.

II. PURPOSE OF TESTIMONY AND RECOMMENDATION

Q4. ON WHOSE BEHALF ARE YOU TESTIFYING?

A4. I am testifying on behalf of the Consumer Advocate.

[1] Clark Kaml, Don't Fear the Cost Study (2022).

Q5. WHAT IS THE SCOPE OF YOUR REVIEW IN THIS PROCEEDING?

A5. My testimony addresses Limestone's rate design including its calculation and application of Equivalent Residential Units ("ERU").

Q6. WHAT IS YOUR RECOMMENDATION?

A6. I recommend that the Commission require the following:

- Detailed formulas and methodologies for ERU calculations be included in the tariff;
- Clear procedures for reviewing and adjusting ERU values;
- Use of actual usage data where feasible;
- Transparency and reproducibility in all calculations;
- Require Limestone to recover the carrying charges over a 3-year period rather than in one year. In the alternative, require Limestone file new rates in one year including an adjustment to reflect removal of the carrying charges.
- Additional Consumer Advocate recommendations are provided in the testimony of Consumer Advocate witness Mr. Novak.

III. RATE DESIGN

Q7. HAVE YOU ADDRESSED THIS ISSUE PREVIOUSLY IN THIS PROCEEDING?

A7. Yes. My direct testimony in this proceeding addressed rate design principles and the use of ERUs to calculate customer bills.

Q8. WHAT RATEMAKING PRINCIPLES WERE ADDRESSED IN YOUR EARLIER TESTIMONY.

A8. My testimony addressed generally accepted rate design principles, largely derived from James Bonbright's in *Principles of Public Utility Rates*, including:[2]

2 JAMES C. BONBRIGHT, PRINCIPLES OF PUBLIC UTILITY RATES, p. 291 (1961).

- Practical attributes of simplicity, understandability, public acceptability, and feasibility of application;
- Freedom from controversies as to proper interpretation;
- Effectiveness of yielding total revenue requirements under the fair return standard;
- Revenue stability from year to year;
- Stability of rates themselves, minimal unexpected changes seriously adverse to existing customers;
- Fairness of the specific rates in the apportionment of total costs of service among different consumers;
- Avoidance of "undue discrimination" in rate relations; and
- Efficiency in discouraging wasteful use while promoting justified types and amounts of use:
    - In control of total amounts of service; and
    - In the control of relative uses of alternative types of service.

Additional principles include:

- Cost causation: the price of utility service should reflect the economic cost of providing service to the customers who cause the utility to incur the expense;
- Offer customers multiple rate options;
- Engage with stakeholders during the process;
- Customer-centric rate design; and
- Value-of-service pricing.

Q9. WHAT ARE SOME OF THE DIFFICULTIES IN APPLYING THESE PRINCIPLES?

A9. Bonbright noted that the list is important in reminding rate makers of the multitude of considerations.[3] However, there are ambiguities, overlapping characteristics, and failure to offer any rules of priority. As such, it may not be possible to produce a single rate design

3 *Id.* at p. 292.

which is simple, fair, and free of controversy.

Q10. HOW DOES LIMESTONE'S PROPOSED COMMERCIAL RATES COMPARE WITH THESE PRINCIPLES?

A10. Limestone's commercial rate design falls short in several fundamental respects:

- It is not simple, easily understood, and its application lacks transparency;
- Customers lack sufficient information to estimate ERUs;
- ERU determinations are subject to interpretation and potential dispute;
- The tariff does not explain how the ERUs are changed or challenged;
- The rate structure lacks a usage-based component and does not send price signals;
- Customer bills have not been stable following implementation of ERU-based rates; and
- There is insufficient information to evaluate whether rates are equitable across customers.

Q11. ARE THERE POSITIVE ASPECTS OF THE RATE DESIGN?

A11. Yes. **Assuming that ERUs remain fixed** absent Commission approval:

- The method provides predictability in billing and revenue stability;
- It is effective in achieving revenue requirements; and
- Once an ERU is assigned, the bill calculation is straight forward.

Q12. EXPLAIN AN ERU IN MORE DETAIL.

A12. The American Water Works Association describes an ERU and the context in which ERUs are used as follows:[4]

> [System Development Charges (SDCs)] are most commonly charged on a

[4] PRINCIPLES OF WATER: RATES, FEES, AND CHARGES – M1, p. 327, American Water Works Association (7th ed, 2017). The Consumer Advocate notes that ERUs are not discussed in this manual's section on rate design. *Id.* at pp. 103-172 (Section IV. Rate Design, 101). A copy of this chapter is attached as CA Exhibit CDK-1.

per equivalent residential unit (ERU) residential equivalent unit (REU), equivalent dwelling unit (ED), equivalent living unit (EL), or capacity unit – is representative of the water capacity (average or peak) required to serve a typical individually metered single-family residential customer.

Limestone relied on the Tennessee Department of Environment and Conservation ("TDEC") design criteria, which assumed a typical residential flow of approximately 300 gallons per day for an ERU.[5]

Q13. HOW ARE ERU VALUES ASSIGNED TO INDIVIDUAL CUSTOMERS?

A13. Limestone stated that it reviews each commercial connection and assigns a facility type based on TDEC criteria. Based upon my review of the process, it includes:

- Identifying facility type;[6]
- Determining the appropriate unit of measurement through publicly available information (e.g. commercial customers' websites);[7]
- Estimating the number of units based upon the publicly available information (i.e. commercial customers' websites);[8] and
- Applying the TDEC design flow assumptions.[9]

The resulting estimate is divided by 300 gallons to derive the ERU estimate. Small businesses were assigned 1 ERU comparable to a residential customer. Higher ERU values were assigned based on anticipated higher flows.

These estimates are based on theoretical capacity designs associated with the type of facilities, not on the actual flow, water usage information for each site, or discussions with

5 *Direct Testimony of Aaron Silas,* Exhibit AJS 3 TDEC's Design Criteria, TPUC Docket No. 24-00044 (Phase 1) (July 16, 2024).

6 *Direct Testimony of Aaron Silas* at 9:25, TPUC Docket No. 24-00044 (Phase 2) (March 2, 2026).

7 *Id.* at 10:4-8.

8 *Id.*

9 *Id.* at 8:16-22. Again, this is criteria for calculating a design flow for construction of a wastewater system, not for the calculation of just and reasonable rates.

each customer to determine use of the facility. There is no evidence in the record linking actual designs or use by individual customers to the design criteria utilized by Limestone. Limestone's ERU estimates are based on assumptions rather than facts regarding the construction or use of specific facilities.

Q14. WHAT ARE YOUR CONCERNS REGARDING USE OF ERU VALUES?

A14. I have four primary concerns:

1. Unit definition

The calculation is dependent on a "unit," the definition of which changes based on facility type. Units include passengers, people, seats, employees, customers, alleys (lanes in bowling alley), guests on-site, meals served, visitors, beds, inmates, users, and students.

2. Design Criteria Misuse

TDEC criteria are intended for reviewing sewage works construction plans, not precise customer billing. Even for the use of "design criteria," TDEC's document sets out a disclaimer on the first page of Chapter 2 which states:[10]

> **DISCLAIMER:** This document is guidance only and does not create legal rights or obligations. Agency decisions in any particular case will be made applying applicable laws and regulations to the specific facts. Mention of trade names or commercial products does not constitute an indorsement or recommendation for use.
>
> **EFFECTIVE DATE: July 20, 2020**

10 *Design Criteria for Review of Sewage Works Construction Plans and Documents,* Document No. DWR-NPDES-SOP-G-02-WW Design Criteria Chapter 2-072020, Design Criteria for Review of Sewage Works Construction Plans and Documents, Chapter 2, p. 2-1, Tennessee Department of Environment and Conservation, Division of Water Resources (July 20, 2020). This chapter is accessible at https://www.tn.gov/content/dam/tn/environment/water/policy-and-guidance/dwr-npdes-sop-g-02-ww-design-criteria-chapter-2-072020.pdf. The full document is accessible at https://www.tn.gov/environment/permit-permits/water-permits1/plans-review-and-approval-for-sewage-works-construction-projects.html.

Further the document states:[11]

> This chapter of the Design Criteria for the Review of Sewage Works Construction Plans and Documents ("*Criteria*") provides guidance for meeting the following performance standards for collection system projects. This includes methodology for estimating wastewater design flows and minimum design standards for collection system gravity lines, manholes, pump stations, and force mains.

3. Rate Structure Issues

The proposed rate design reflects a policy decision to assign all revenue requirement responsibility in this class, fixed and variable, on a fixed charge basis, regardless of use. This assumes that variable cost assignments are to be made based on standard capacity for the typical type of facility identified.

The structure:

- Misaligns rates with costs;
- Does not reflect real consumption;
- Deviates from standard rate design practices,

Furthermore, the language of the tariff is not clear. Within normal nomenclature, the rate would be considered a variable, as it is being applied to a variable component, ERU (a volume). A **fixed charge** is a consistent, recurring amount, regardless of activity level. A **fixed rate** is an amount that varies based on usage ($/gal).

Although the rate is nominally applied on a per-ERU basis, suggesting a volumetric structure, Limestone has assigned each customer a fixed number of ERUs based on standardized design criteria rather than actual metered usage. As a result, the billed quantity is no longer variable in practice.

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11 *Id.* at 2-7.

Because each customer's ERU value is fixed, the charge becomes effectively a fixed monthly fee, not a true volumetric charge. What appears to be a usage-based rate is instead based on a predetermined estimate of usage (e.g., 300 gallons per ERU), rather than actual consumption.

Moreover, the underlying ERU assignments are derived from generalized capacity or design standards, not the real operating characteristics or demand patterns of individual facilities. This introduces a second layer of abstraction:

- First, usage is estimated rather than measured.
- Second, that estimate is standardized rather than customer-specific.

In effect, the rate design has shifted from a genuinely volumetric structure—where charges vary with actual usage—to a capacity-based proxy, where charges are determined by assumed or hypothetical demand. This fundamentally changes the nature of the rate:

- From usage-driven pricing → to design-capacity-driven pricing
- From variable charges → to embedded fixed charges based on assumed demand

4. Subjectivity

The fundamental concept of multiplying the number of ERUs by the rate is a clear and understandable computation. It is a mathematical equation if the necessary values are known. However, there are difficulties determining the appropriate components:

- There appears to be subjective nature based on Limestone's judgement.
- The Company has not been able to demonstrate how the actual values are calculated.
- The values are not independently reproducible based on generally observable information and judgement.

Q15. DOES THE TARIFF PROVIDE THE INFORMATION NECESSARY TO CALCULATE THE ERUs?

A15. No. The tariff does not fully explain ERU calculations, provide formulas, or how ERUs can be challenged. The tariff offers:[12]

> *Equivalent Residential Units ("ERU's") have been assigned to each Commercial Customer utilizing typical wastewater flow rates derived from the Tennessee Department of Environment and Conservation "Plans Review and Approval of Sewage Works Construction Plans and Documents".

Q16. IS THERE EVIDENCE OF DIFFICULTIES IN ESTIMATING ERUs?

A16. Yes. Limestone has not provided actual calculations. The values contained in Limestone's *Petition* and responses to discovery requests are hard-coded. More specifically, in its Discovery Request No. 1-2, the Consumer Advocate requested the following from Limestone:[13]

> a. Provide the values for each component and calculations or analysis used to determine the ERU for each customer.
> b. If the ERU was estimated, provide the values used to create the estimate.

Limestone's response stated:[14]

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12 *Limestone Water UOC, Water & Wastewater Service Tariff*, Rate Schedules, Original Sheets #3-6, Effective 5/1/2025, TPUC Docket No. 24-00044 (Phase 1) (May 1, 2025). A copy of these tariff sheets is attached as CA Exhibit CDK-2.

13 *Consumer Advocate's First Set of Discovery to Limestone Water Utility Operating Company, LLC*, pp. 5-6, CA DR1-2, TPUC Docket No. 24-00044 (Phase 2) (March 11, 2026).

14 *Limestone's Responses to the Consumer Advocate's First Set of Discovery*, pp. 4-5, CA DR1-2, TPUC Docket No. 24-00044 (Phase 2) (March 18, 2026). A copy of the response is attached as CA Exhibit CDK-3.

a. The values and calculations used to determine the Equivalent Residential Units ("ERUs") assigned to each commercial customer are provided in the Company's Phase 2 filing. Specifically, the tab labeled "**Confidential** Commercial ERU Data" in the file CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx identifies, for each commercial customer, the facility type, applicable design basis, typical flow assumptions, and resulting ERU multiplier used in the Phase 2 rate design.

In addition, Attachment 1-2 provides a reference table summarizing the design basis, typical flow values, ERU multipliers, and source documents by facility type, consistent with the methodology described in the Company's tariff and testimony.

b. All such values can be found in the "**Confidential** Commercial ERU Data" tab of the Phase 2 Excel spreadsheet.

As noted above, the ERU values are contained in Limestone's *Petition* in the CONFIDENTIAL Proposed Phase 2, Limestone Rate Design, Confidential Commercial ERU Data tab. The supporting documentation is descriptive information, not numerical values and calculations that result in the ERU multiplier and ERU value for each customer. The ERU values for customers continue to be Limestone's hard coded values. The Company has failed to provide the actual calculations that produce the ERU values.

The difficulty associated with estimating ERUs is also demonstrated in changes between original estimates and those in phase two. The following are examples from Exhibit AJS-3:

- For commercial customers, the 2025 Actual Determinants were approximately 381 ERUs monthly with the phase two Attrition Determinants approximately 514 ERUs per month. This is a monthly increase of approximately 133, and an annual increase of 1,602. The Company explained that the difference was due to updates.
- The determinants for Cartwright Creek increased approximately 1,023 ERUs from 2025 actual to Phase 2.

- The number of determinants for Lakeside Estates increased to approximately 587 ERUs.

Other evidence is reflected in rate impacts to customers. The proposed Phase 2 rates have increases of up to approximately 40 percent for certain residential customers (e.g., Cartwright – Arrington/Hardeman/ Hideaway residential customers increasing from $75 to $105.08) and up to approximately 195 percent for certain commercial customers (e.g., Shiloh Falls commercial customers increasing from $55.60 to $163.92). The Company explained that the rate increases reflect mechanical implementation of the remaining Commission approved recovery using updated billing determinants. These are not the result of new rate design changes.[15]

Q17. WHAT ARE SOME INDICATIONS OF THE SUBJECTIVE NATURE OF THE ERUs?

A17. The confidential response to Consumer Advocate DR 1-18 provides numerous indications of the subjective nature of ERU determination. In the source/comment column for those identified as [redacted] explanations frequently start with [redacted] [16] The explanations often include discussions of the [redacted] There is not a clear formula for producing the ERUs.

Many of the values are clearly estimates with the explanations stating that the ERU value [redacted]

15 *Id.* at pp. 8-11, CA DR1-4. A copy of the response is attached as CA Exhibit CDK-4.

16 *Id.* at p. 21, Excel Spreadsheet, File <CONFIDENTIAL 1-18 Design Basis Support (1).xlsx>, Tab "Sheet 1" (Updated March 23, 2026). A copy of the response is attached as CONFIDENTIAL CA Exhibit CDK-5.

One such example is the comment on [redacted] which states:[17]

[redacted]

Additional examples can be found in the difference between the estimates contained in and the ERU estimates in Limestone's Phase 2 filing,[18] and in its confidential responses to CA DR1-3.[19] This response is an example of the difficulty that customers had with understanding the ERU estimates and having ERU values modified to reflect values the customers considered more realistic.

Q18. EXPLAIN THE DIFFERENCE BETWEEN USING DESIGN CRITERIA AND ACTUAL WATER USE.

A18. Actual usage and design criteria are two fundamentally different measures with different purposes and results. Design criteria are important for forecasting and planning and may not reflect real-world conditions. They rely on standardized values and are often considered outdated due to their reliance on historical water usage that does not reflect current consumption patterns and costs.

In this Docket, the Design Criteria utilized by Limestone was published in 2020 and may

17 *Id.* at Line 114.

18 Excel Spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design3.xlsx>, Tab "CONFIDENTIAL Commercial ERU Data" (March 2, 2026).

19 Excel Spreadsheet, File <CONFIDENTIAL CA Exhibit CDK-6 (Corrected CONFIDENTIAL DR1-3).xlsx>; Limestone's CONFIDENTIAL Responses to the Consumer Advocate's First Set of Discovery, pp. 4-5, CA DR1-3, and Excel Spreadsheet, File <CONFIDENTIAL CA Exhibit CDK-6 (ERUs & Cust Compl).xlsx>.

not reflect current estimates or usage patterns.[20]

Q19. WHAT IS YOUR RECOMMENDATION?

A19. When possible, actual measurements are a preferred method to estimates. Wastewater is not commonly measured. However, the correlation between water use and wastewater is well established and removes guesswork and disputes over type of facility, applicable measurement units, and number of units. Thus, prior to using design data for estimates, Limestone should be required to demonstrate that it has taken reasonable efforts to obtain actual water use date to determine wastewater flows.

It may be reasonable to offer customers the opportunity to opt into an ERU measurement using design criteria.

IV. CARRYING CHARGE RECOVERY

Q20. HOW DOES LIMESTONE PLAN TO RECOVER CARRYING CHARGES ASSOCIATED WITH REVENUE UNRECOVERED DURING PHASE 1?

A20. Limestone proposed to recover the carrying charges in one year. Limestone intends to terminate the carrying charges after it has been recovered.[21]

Q21. HOW DO YOU PROPOSE THAT CARRYING CHARGES BE RECOVERED?

A21. A more typical approach is to recovery of the carrying charges associated with a rate case is to spread them over a longer period, such as 3 to 5 years. If costs are recovered over a one year period, new rate schedules reflecting the reduction in revenue requirement would

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20 *Design Criteria for Review of Sewage Works Construction lans and Documents,* Document No. DWR-NPDES-SOP-G-02-WW Design Criteria Chapter 2-072020, Design Criteria for Review of Sewage Works Construction Plans and Documents, Chapter 2, p. 2-1, Tennessee Department of Environment and Conservation, Division of Water Resources (July 20, 2020).

21 *Limestone's Responses to the Consumer Advocate's First Set of Discovery*, p. 3, CA DR1-1, TPUC Docket No. 24-00044 (Phase 2) (March 18, 2026). A copy of the response is attached as CA Exhibit CDK-7.

need to be filed. A more reasonable approach would be to recover the carrying charges over a 3-year period. This is discussed in more detail in the testimony of CA witness Mr. Novak.

In the alternative, Limestone should be required to file new tariffs in one year with a revenue reduction of $54,346.01 reflecting recovery of the carrying charges.

V. RECOMMENDATIONS

Q22. WHAT ARE YOUR RECOMMENDATIONS?

A22. I recommend the Commission require the following:

- Detailed formulas and methodologies for ERU calculations be included in the tariff;
- Clear procedures for reviewing and adjusting ERU values;
- Use of actual usage data where feasible;
- Transparency and reproducibility in all calculations;
- Require Limestone to recover the carrying charges over a 3-year period rather than in one year. In the alternative, require Limestone file new rates in one year reflected an adjustment to reflect removal of the carrying charges.
- Additional Consumer Advocate recommendations are provided in the testimony of Consumer Advocate witness Mr. Novak.

Q23. DOES THIS CONCLUDE YOUR TESTIMONY?

A23. Yes, it does. However, I reserve the right to incorporate any new data that may subsequently become available.

IN THE TENNESSEE PUBLIC UTILITY COMMISSION
AT NASHVILLE, TENNESSEE

IN RE:	)	
	)	
PETITION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC TO INCREASE CHARGES, FEES AND RATES AND FOR APPROVAL OF A GENERAL RATE INCREASE AND CONSOLIDATED RATES [PHASE 2 INCREASE]	)	**DOCKET NO. 24-00044**

AFFIDAVIT

I, Clark Kaml, on behalf of the Consumer Advocate Division of the Attorney General's Office, hereby certify that the attached Direct Testimony represents my opinion in the above-referenced case and the opinion of the Consumer Advocate Division.

CLARK D. KAML

Sworn to and subscribed before me
this 26 day of March, 2026.

Terra Allen
NOTARY PUBLIC

TERRA ALLEN
STATE OF TENNESSEE NOTARY PUBLIC
HICKMAN COUNTY
My Commission Expires JAN 31, 2027

My commission expires: 1/31/2027.

CA Exhibit CDK-1

PRINCIPLES OF WATER: RATES, FEES, AND CHARGES – M1, P. 327, AMERICAN WATER WORKS ASSOCIATION (7TH ED, 2017)

Chapter VII.2

System Development Charges

A *system development charge* (SDC) is a one-time charge paid by a new water system customer for system capacity. It is also assessed to existing customers requiring increased system capacity. The receipts from this charge are used to finance the development of growth-related or capacity-related water facilities and are an important funding/financing source for these facilities.

Although a one-time charge, SDCs are not always paid up front. Some states require utilities to offer an option to pay the SDC in installments if the fee is over a certain amount. Utilities often offer such an option with the potential for financing terms that allow for installment payments spread over several months or years.

The development of the appropriate level of SDCs provides utilitie and policymakers with a cost-ba ed analysis of the value of existing and planned capacity that is available or will be developed to serve and accommodate new capacity demands. By under tanding the co ts of providing capacity, policymakers can make an informed decision concerning the equity of allocating system capacity costs between existing and new customers.

Utilities make investments in capacity-related facilities that will provide service to new development in advance of when the new development occurs. Typically, the capacity-related facilities are constructed in fairly large increments, and the new customers that this capacity is intended to serve will typically connect to the system over many years. As a result of the size of the capacity expansion and the timing of when customers connect to the system, the timing of receipts generated from the SDC is rarely synchronized with the construction of the capacity-related facility. Therefore, SDCs provide an equitable method for recovering the costs of ystem capacity additions from those who will use the increased capacity; although in most cases, some portion of the capacity-related costs mu t still be recovered from u er rates and charges assessed to all customers due to the aforementioned timing issues.

In general, SDCs are based on the costs for major backbone infrastructure components that are nece sary to provide service to all customers, including source-of-supply facilities, raw water transmission, treatment facilities, pumping facilities, storage tanks, and major treated-water transmission mains (e.g., "general benefit" facilities; see

Figure VII.1-1). Much less common, and only when local circumstances or applicable state or local government statutes specifically allow for it, the costs of water distribution mains and other facilities might also be recovered from SDCs.

The development of SDCs and the use of SDC receipts are often governed by state or provincial legislation as well as case law. Most jurisdictions have specific legislation, and the language and requirements vary from jurisdiction to jurisdiction and are subject to change. Therefore, an important starting point in determining SDCs is to understand any applicable and current legislation or laws related to SDCs to help ensure that the utility' SDCs are calculated and administered in a defensible manner.

System development charges, or SDC ., is the commonly used terminology to describe these charges, but it is not unusual for utilities to use another name for them. Other commonly used names include, but are not limited to,

- impact fees or development impact fees,
- system capacity charges or capacity fees,
- capital facility fees,
- development fees,
- general facility charges,
- expansion charges,
- plant investment fees,
- system buy-in charges,
- capital charges,
- capital recovery fees, and
- dedicated capacity charges.

It is important for utilities to ensure that the persons preparing the SDC calculations are considered qualified in the utility industry and in the applicable state. Some states require that a registered professional engineer prepare the SDC calculations (e.g., Arizona at the time of this manual's publication).

Finally, this chapter is meant as a guide for utilities when considering an SDC program. Each agency ha specific circumstances when it comes to system planning, facility requirements, and cost structures. Final consideration should be given to local characteristics and policies, state legislation (if applicable), and legal counsel opinion.

FINANCIAL GOALS AND OBJECTIVES

A critical step in developing SDCs is to identify the objectives to be achieved by the SDC program, which might include some or all of the following:

- Require new development to pay its own way—that is, "growth pays for growth."
- Fund major system expansions.
- Minimize debt or reduce the need for future debt.
- Equitably recover capacity-related capital costs from current and future customers to achieve equity between the different generations of ratepayers (intergenerational equity).
- Maintain an appropriate level of retained earnings and cash reserves to meet other capital needs of the system.

- Equitably reimburse the existing ratepayers for their investment in oversizing of infrastructure to accommodate future customer .

The development of SDCs must also consider

- any local and state/provincial legal or statutory requirements,
- financial objectives of the utility,
- generally accepted water utility industry financing and pricing practices, and
- methodologies for determining SDCs based on industry standard practices.

The use of SDC receipts i generally limited. First, SDC receipts can be used to directly pay for a growth-related capital improvement project. In using the SDC receipts in this manner, the utility will likely have avoided, or at least minimized, the use of long-term debt or pay-as-you-go rate funding for the project that shelters the existing ratepayers from the cost of expansion of the system and, hence, may reduce the need for monthly user rate increases. The other typical use of SDC receipts is to apply them against growth-related debt service. When a utility ebt to pay for a growth-related capital project, the associated debt service is generally paid using SDC receipts. In doing so, the utility may be able to better align the cash flows related to the debt service with the timing of the new connections and receipts derived from SDCs. However, it is important to be aware of any legal restriction or bond covenants related to the use of SDC receipt being applied to debt-service payments. The utility should also be cautious, and not overly reliant, on the use of SDC receipts to pay for debt service because SDC receipts are growth-dependent and not necessarily a stable source of funding from year to year.

Utilities may experience some opposition to the implem ntation of SDCs. For example, in some cases, local builders and developers oppo e the charges because SDCs add to their up-front development costs. Working closely with the building and development community to provide a better understanding of the derivation of the SDCs, along with the dedicated purpose and use of the SDC receipts, is often an important step in the implementation of these charges. Some states have statutory requirements for involving advisory committees consisting of members of the development community. An SDC i a financial commitment on the part of both the development community and the utility. In the absence of SDCs, a utility may be unwilling to raise their existing customer ' rates to build the facilities needed to accommodate the capacity requirements of future development.

METHODOLOGY AND LEGAL CONSIDERATIONS

The development of an SDC should include a review of the legal authority and relevant legislation related to the establishment of SDCs. Legal authority to impose an SDC may be granted through enabling legislation, statutes regarding general law or home rule authorities, local charter, utility operation permits, utility service certifications, regulatory guidance, or judicial rulings. For municipal utilities, there may be specific legislative guidelines or requirements that govern the SDC determinati ementation and assessment practices. For investor-owned utilities, and in ome ca es municipal utilities, the public utility commissions have rules of practice concerning capital co t recovery and rate-making.

When considering the development and implementation of SDCs a utility should

- consider statutes or public utility commission rules of practice (many legislatures have searchable statutes on their Internet sites);

- review the relevant case law for commission and judicial decisions relating to SDC practices and procedures for developing and implementing SDCs;
- seek competent legal advice, particularly when litigation risks are uncertain; and
- evaluate the underlying criteria important to a specific water system or jurisdictional environment.

The Rational Nexus Test

A common legal consideration related to SDCs is establishing a reasonable relationship, or rational nexus, between the amount of the SDC and the cost associated with serving the new development. In general terms, the rational nexus test requires that there be a connection (nexus) 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 expected to be received by the new development. These requirements have been reinforced by the US Supreme Court through landmark decisions on private property rights, especially in the case of *Nollan v. California Coastal Commission* in 1987 (483 US 825) and *Dolan v. City of Tigard* in 1994 (512 US 687). The precedence established by the rulings in these two cases has helped to establish the standard for rational nexus incorporated in many state statutes and case law.

To establish the rational nexus, several key criteria are often used, including, at a minimum, the following:

- System planning criteria
- Financing criteria
- State and provincial or local laws

According to Arthur C. Nelson (1995), the rational nexus test examines the following:

1. A connection should be established between new development and the new or expanded facilities required to accommodate such development. This establishes the rational basis of public policy.
2. Identification of the cost of these new or expanded facilities needed to accommodate new development. This establishes the burden to the public of providing new facilities to new development and the rational basis on which to hold new development accountable for such costs. This may be determined using the so-called *Banberry* factors [*Banberry Development Company v. South Jordan City* (631 P.2d 899, Utah 1981)].
3. Appropriate apportionment of that cost to new development in relation to the benefits it reasonably receives. This establishes the nexus between the fees being paid to finance new facilities that accommodate new development and the benefit new development receives from such new facilities.

The first element of the rational nexus test examines the establishment of a rational basis for the policy being implemented through the fees. This implies that planning and capital improvement studies are used to establish the need for new facilities to accommodate anticipated growth. Adopted master or comprehensive plans or facility plans, or similar types of studies, should satisfy this first element because these plans assess existing facilities and capacity, project future capacity requirements, and determine the future capital infrastructure and new facilities needed to accommodate anticipated growth.

The referenced nexus test can be satisfied based on an assessment of both current and future capacity available to meet growth-related demands. For example, a utility that

has, in the extreme, constructed all of the water system capacity required through the planned "build-out" of the service area can still make the nexus between the charge and the facilities needed to accommodate the anticipated growth. In this example, the basis for the charge would be the existing capacity available to serve new demands.

The second element of the rational nexus test examines factors such as the so-called *Banberry* factors, which include seven factors the Banberry court used "to determine the proportionate share of costs to be borne by new development" (Nelson 1995):

1. The cost of existing facilities.
2. The means by which existing facilities have been financed and who paid those costs.
3. The extent to which new development has already contributed to the cost of providing existing excess capacity.
4. The extent to which existing development will, in the future, contribute to the cost of providing existing facilities used community-wide or non-occupants of new development.
5. The extent to which new development should receive credit for providing at its cost facilities the community has provided in the past without charge to other development in the service area.
6. Extraordinary costs incurred in serving new development.
7. The time-price differential inherent in fair comparisons of the amount of money paid at different times.

Although these factors provide reasonable guidance in the development of SDCs, they should not be required in all jurisdictions.

The final element of the rational nexus test is the reasonable apportionment of the cost to new development in relation to benefits the new development will reasonably receive. This is accomplished by using a generally accepted methodology to establish the SDC. The financing criteria for establishing SDCs relates to the method used to finance infrastructure and ensures that customers are not paying twice for infrastructure—once through SDCs and again through rates.

Most statutes require a *reasonable relationship* between the fee charged and the cost associated with providing capacity to the customer. The charges do not need to be mathematically exact or reflect the cost to serve a specific customer (i.e., the SDC must be indicative to serve a class or group of customers) but must bear a reasonable relationship to the cost burden imposed. Implementation of the planning criteria and the actual and planned costs of construction will typically establish compliance with the reasonable relationship requirement. Some states require that SDCs must be based on the most recent and localized data, and this practice is recommended for all SDC calculations.

Given that fee factors and capacity-related cost structures differ among jurisdictions, benchmarking or comparing a utility's SDCs with "peer" or neighboring/regional agencies must be performed with caution. Reasons why SDCs can differ among utilities include the following:

- Source of supply
- Proximity to source of supply
- Type/complexity of treatment
- Effluent disposal method
- Availability of grant funding

- Administrative policies
- Time elapsed since last SDC fee review
- Density within service area/size of system
- Utility life cycle (growth-oriented versus mature)
- Level of service standards
- Local policy decisions

Depending on relevant legal and accounting requirements, it is important for utilities that charge SDCs to track the receipts carefully and separately so they can ensure that the receipts are applied to offset growth or expansion-related capital costs and are not used for operations and maintenance (O&M) or any other purpose not allowed by the pertinent regulations.

INFORMATION AND DOCUMENTATION FOR CALCULATIONS

Information needed to calculate SDCs may include asset records, a line inventory, the multiyear capital program often developed through the master planning process, and planning documentation. Each of these items is discussed in the following sections.

Asset Records

A utility should maintain detailed asset records to improve the accuracy of impact fee calculations. SDC calculations often consider the costs of a utility's system costs—the backbone or primary supply, treatment and transmission facilities in-service that have capacity available to serve new growth. If a utility has substantial unused capacity and no planned capacity expansions in the intermediate term, the SDC calculations may be based exclusively on the costs of the existing facilities.

To facilitate the accurate identification of these costs, the utility's asset records should ideally include the following items for each asset

- Asset number
- Asset location
- Acquisition date
- Purchase price
- Accumulated depreciation
- Whether the asset was purchased, funded through grants, or contributed

The costs of grant-funded and contributed assets are ineligible to be recovered through SDCs because such costs were not incurred by the utility and SDCs should not provide a "windfall" to existing users. The total costs for all the assets should closely match what is reported in the utility's annual financial report for the appropriate time period.

Line Inventory

A utility should maintain an up-to-date inventory of the amount of linear feet of water transmission and distribution mains by line size (diameter), and reclaimed water mains by line size. This information can assist in classifying water transmission versus distribution mains. (Given less than perfect information, the inventory data can be used to develop a reasonable allocation assumption.) Some utilities have incorporated the classification

standards into their code of ordinances (e.g., transmission lines are generally any main greater than 12 in. in diameter).

Capital Program

If SDCs are to be calculated based on a multiyear projected capital improvement program, utility management should first en. ure that the capital program from which the SDC calculations are derived is necessary, reasonable, attainable, and fundable. The utility hould clearly indicate those projects that are growth related and will create additional capacity versus tho e projects that are renewals, replacements, and upgrades that will primarily benefit existing cu tomers.

The projects should also be classified into functional categories such that the costs eligible to be recovered through SDCs can be identified.

Planning Documentation

Some states require land-u e assumptions and improvement plans within the SDC methodology and documentation. Master plans, comprehensive plans, and facility use plans as adopted by the utility's governing body often provide important as umptions from which the SDC calculation are based, such as level-of-service tandards, multiyear capital plan with cost estimate , and capacity of facilities and planned improvements and expansions.

NEW CUSTOMER DEMANDS (LEVEL OF SERVICE)

SDCs are mo t commonly charged on a per-equival nt residential unit (ERU) basis. An ERU—sometimes known as an equivalent residential connection (ERC), residential equivalent unit (REU), equivalent dwelling unit (EDU), equivalent living unit (ELU), or capacity unit—is representative of the water capacity (average or peak) required to erve a typical individually metered single-family residential customer. This cla s of users usually represents the large t group of customers served by a utility and typically has the lowest level of usage requirement for a specifically metered account.

An important assumption in calculating an SDC is the level-of- ervice standard assigned to an ERU. For water service, the level-of-service standard that is commonly used in the utility industry is the amount of capa ity (service) allocable to an ERU expressed as the amount of usage (e.g., gallons, cubic feet) on an average-day or peak basis. This allocation of capacity represent the amount of capacity allowable to an ERU for ystem engineering and planning purpo es, whether or not such capacity is actually used by the customer.

It is very important for a utility to be able to provide ju tification for any level-of-service standard used in the SDC calculations. A review of historical customer and per capita flows and peak-to-average-daily-flow water production relationships and trends can indicate whether an existing level-of-service standard i till appropriate or whether it should be updated. The water usage per customer may have decreased with some degree of permanence uch that a lower level-of-service tandard should be considered. Factors that could cau e uch a downward trend may include

- continued water conservation pricing efforts by local governments;
- improvements in water use requirements for household appliances, such as clothes washers and dishwashers, low-flow toilets, and water fixtures;
- increases in customer densities to reduce the cost of construction that result in less pervious surface to irrigate; and

- general customer awareness of the need to reduce water use (e.g., installation of xeriscape landscaping).

Sources that recognize or establish general level-of-service standards for water facilities include

- utility governing documents;
- the local government's code of ordinances for public utilities;
- the growth management plan;
- the utility's master plans and engineering design criteria used to establish the need for additional capacity;
- state regulatory agencies for private utilities;
- state departments of health; and
- state departments of environmental protection.

It may also be appropriate to survey the level-of-service standards used by neighboring utilities, especially those with similar service area characteristics.

The total ERUs—often expressed in gallons—assigned to a new customer comprise the "new customer demands" referenced in this chapter.

APPROACHES TO CALCULATING SDCs

Potential Costs in SDC Calculations

The costs that might be recovered through the imposition of SDCs depend on the calculation approach and the utility's specific circumstances. Some tate laws specify that any capital co ts included in SDC calculations must have a minimum useful life (5 years in some states, 10 years in others). A discussion of the major cost categories follows.

Installed system assets. The proportionate share of the cost of sy tem assets available to serve growth may be eligible to be recovered through SDCs if the utility actually incurred the cost. The costs of contributed assets or asset funded through grants or other relatively cost-free means are ineligible to be included in SDC calculations.

Estimated capital program. The projects in the apital program hould also be classified into functional categories in a similar fashion as described previously for the existing assets. Once the projects are classified, standards for including the capital project cost in the SDC calculations could be as follows:

- The project is related to the utility's water supply, water treatment, or primary transmission/storage.
- The project is identified as being growth related or provides a system-wide benefit, the cost of which should be shared by growth connecting to the system and existing customers.
- The project will result in a fixed asset(s) being added to the system and will not be recognized as operating expense. (New or revi ed accounting standard sometimes mandate the reclassification of certain capital expenditures represented in the capital program as operating expenses.)
- The project is not anticipated to be funded through grants or other contributed capital.

All of the aforementioned standards would need to be met for a project cost to be included in the SDC calculations.

The util ould be prepared to defend the inclusion of every project in the SDC calculations (e.g., explain the purpose and the benefit to new growth). If a project is ambiguous in cope (e.g., a placeholder) r does not provide a clear benefit to new growth, it should not be included in the calculation . "When in doubt, leave it out" is a good principle to follow.

One issue to con ider i the treatment of renewal and replacement (R&R) projects in a multiyear capital improvement program for the purpose of calculating SDCs, especially if the R&R projects involve assets with capacity remaining to serve growth. The most conservative approach is to not include any R&R projects in the calculations. However, R&R projects are typically replacing existing fixed assets with more expensive assets (e.g., due to hi torical inflation and technology improvements). If the new assets represented in the capital improvement program are included in the impact fee cal ulations while the assets being replaced are removed from the calculations, then the utility has es entially created a pro forma fixed asset register that "right-sizes," or updates into today' dollar , the costs of the facilities in service that have capacity to erve growth. This approach promote inter-period equity. (Once the capital improvement i executed, the then-current fixed as t register would presumably match the pro forma fixed asset register developed years earlier.)

Notably, existing customers may not be responsible for the need for all of the utility's R&R projects. Sometime asset must be replaced because of premature aging (e.g., as a result of contaminant intrusion) or as a result of limited or no use (e.g., the assets were built for growth that never materialized expe ted).

Another issue relates t the costs of relocating water and wastewater line due to the widening of road that is nece sitated by new growth. The incremental increase in the costs of the lines, or any upsizing component, may be eligible to be recovered th ough SDCs.

Interest costs. Interest costs a sociated with financing system assets may be eligible to be recovered through an SDC, or such co ts might be reco ered through a eparate fee charged to growth.

Administrative costs. In addition to the costs of existing facilities and capital improvements, utilities are typically allowed to recoup the administrative costs of managing SDC fee programs within their calculated SD

Reclaimed/reuse water system costs. The reclaimed water ystem of a utility is a form of (treated) wastewater disposal, and the capital costs associated with a reclaimed water sy tem can justifiably be included in wa tewater SDC fee calculations. However, reclaimed water, which is typically u d for irrigation purpo es, also reduces ystem potable water demand. Therefore, it al o provides a clear benefit to the water system. Without the availability of reclaimed water, the utility may need to invest in costly water treatment plant expansion or new water supply ources. As such, it may be appropriate to include a portion of the reclaimed water system capital costs in the water SDC calculations.

Basic Approaches

There are many different methods that may be used to calculate cost-based system development charges. The three basic or common methods for calculating the SDCs are as follows:

1. The *buy-in method* is based on the value of the existing system' capacity. This method i typically used when the existing ystem has sufficient capacity to serve new development now and into th future.

2. The *incremental cost method* is based on the value or cost to expand the existing system's capacity. This method is typically used when the existing system has limited or no capacity to serve new development and new or incremental facilities are needed to serve new development now and into the future.
3. The *combined approach* is based on a blended value of both the existing and expanded system's capacity. This method is typically used where some capacity is available in parts of the existing system (e.g., source of supply), but new or incremental capacity will need to be built in other parts (e.g., treatment plant) to serve new development at some point in the future.

Fundamental Formula

According to any of the basic approaches discussed previously, the fundamental formula for calculating an SDC is

$$\frac{\text{System Value}}{\text{System Capacity}} \times \text{New Customer Capacity Demands} = \text{SDC}$$

This formula starts by determining the unit value of the water system's capacity and multiplies that unit value by the amount of capacity the new customer will demand. (See the level-of-service discussion in the previous section.) The result is an SDC that apportions the value of the system capacity to a new customer based on how much of the capacity the new customer will use.

Because system capacity is generally not available in the same proportions throughout the various functional components of the water system (e.g., source of supply, treatment, pumping), the formula may be used for each functional area to calculate the SDC component cost by functional component (e.g., source of supply, pumping, treatment). This allows the utility to recognize variations in system capacity, system value, and customer capacity needs by functional area. Summing the SDC functional component costs result in the water system SDC.

Also, by applying the formula to each functional area of the water system, the analysis can recognize that the design and operating criteria for each functional area may differ. For example, an impounded reservoir supply may have annual average-day usage as the basis of capacity while treatment, pumping, and transmission mains are more likely to have a maximum-day demand capacity in terms of million gallons per day.

The key steps in the analysis are the same, regardless of the overall methodology selected:

1. Determine system planning criteria.
2. Determine the associated cost or value and available capacity of capacity-related facilities.
3. Determine new customer demands for each functional area of the system.
4. Calculate system component costs.
5. Determine any credits.

EXAMPLES OF SDC METHODOLOGIES

The mathematical examples presented in this chapter are intended to assist the reader to understand the calculations involved in determining SDCs and are not intended to

be u ed as step-by-step template for calculating SDCs. These example are designed to illustrate the basic concepts associated with calculating SDCs according to each methodology. There may be variations on these approaches that would till be considered legally defensible.

For purposes of implification of the examples, it i presumed that an adopted master plan has been used to determine the system planning criteria. This plan defines and establishes the exi ting capacity and projected futur customer growth to the build-out of the service area or a defined planning period (e.g., 20 years). The adopted ma ter plan al o specifies the expansion or growth-related facilitie that will be required to accommodate the projected future growth. Given tho e key assumptions, the examples presented in the following ections focu primarily on the calculation of the system component costs and, more specifically, on the valuation of capacity according to each of the methodologies.

In the example calculation of the SDC, in very basic terms, the total value of each functional backbone component is divided by the appropriate gallons of system capacity provided to establish a unit co t ($/gal) for the SDC cal ulation. A commonly used approach for determining new customer capacity demand i to use the demand for the base-size connection (u ually ⅝-in. or ¾-in. meters). Once the unit ost ($/gal) is determined, the average capacity demands of the base cu tomer (average day and maximum day as applicable) i multiplied by the unit co t ($/gal) to derive a total SDC ost. Therefore, if the calculated unit cost of one backbone component is $1.50/gal and a base- ize connection has an average-day requirement of 250 gallons, the charge for that component of the SDC, before any credits (ee the "System Liabilities and Equity" subsection later in this chapter), would be $375.00 ($1.50 × 250 gal). This type of approach is well suited to backbone components such as treatment plants, reservoirs, and o on, where the total capacity of the treatment plant or reservoir is well establi hed.

In the example presented in the following ections, pump station are used for the purpose of illu trating the variou methodologies. To calculate a full and complete SDC, each component of the backbone ystem (source of upply, treatment, pumping, transmis- ion, etc.) would be eparately analyzed. Each backbone component i added together to determine the *gross* SDC before any debt-service credit . At that point, any debt credits to the SDC should be deducted from the gros SDC to establish the net allowable system development charge.

Buy-in Method

The buy-in method is typically used where there i ufficient capacity in the exi ting system uch that it is capable of meeting both near-term and long-term capacity needs. Under the buy-in methodology, new development "buys" a proportionate share of capacity at cost (value) of the existing facilities. It is important to note that while this methodology is labeled a *buy-in method*, payment of an SDC does not transfer or impart ownership of assets to the customer. Payment of an SDC, under this method, i generally considered to provide access to capacity in the amount purcha ed at a status equal to that of existing customer of the system.

The buy-in method is ba ed on the principle of achieving capital equity between existing and new cu tomers. This approach attempts to a ses new customers an SDC to approximate the average equity or debt-free investment position of exi ting customers.

Valuation and system equity. There are different methods u ed to e tablish a value to the existing a sets under the buy-in methodology. If the exi ting a ets are valued at their original cost or depreciated original cost, thi is often referred to as the *original cost method*. An alternative valuation approach is to value the existing assets at a replacement cost or a depreciated replacement cost. Thi is commonly referred to as the *replacement cost method*. According to the replacement co t method, the existing system components are

valued at the current-day cost of replicating the existing assets. This is typically accomplished through the use of a construction cost index or other comparable valuation method to bring the historical costs up to current-day value. In summary form, the four valuation approaches for system assets under the buy-in method are as follows:

1. **Original cost (OC)** is the cost of construction in the year of construction.
2. **Original cost less accumulated depreciation (OCLD)** is also known as the net book value of the system assets.
3. **Replacement cost new (RCN)** is the original cost escalated to current-day dollars, providing an estimate of the current-day cost of replicating the existing facilities.
4. **Replacement cost new less depreciation (RCNLD)** is the original cost escalated to current-day dollars, less accumulated replacement cost depreciation. This provides an estimate of the current-day cost of replicating the existing facilities that is then adjusted by an estimate of the replacement cost depreciation, resulting in a replacement cost valuation that reflects the remaining depreciable life of the facility.

A combination of the approaches may also be used. Using the OC and OCLD valuations, the SDC 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 SDC 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 also be 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 for development.

System liabilities and equity. Balance-sheet liabilities and equity that are recognized in the valuation method should equitably address the issue of the outstanding principal portion of long-term debt. When debt is issued to finance a growth- or expansion-related project, the principal portion of the debt service will be repaid over time, possibly through a customer's rates after connection to the system and payment of an SDC. Given that, a debt credit may be applicable to avoid the potential double-charging of these debt costs through both the SDC and user rates. In a situation where the SDC is separated into functional components (source of supply, treatment, pumping, transmission, etc.), the analysis may provide these debt credits at the functional level or on a combined system level at the end of the analysis.

SDC calculation adjustments. Valuation adjustments may be necessary if grants or other contributions were used to develop the capacity-related facilities or if a facility is replaced and the resulting replacement provides additional capacity to accommodate future customers. This may be addressed within the valuation process by determining the percentage of the asset eligible for the SDC (i.e., percent SDC eligible). For example, if grants were provided specifically for the water treatment facilities, these grant contributions should be credited to the value (cost) of those specific facilities, and the grant-related portion of the water treatment plant's value should not be included in the SDC.

SDC determination—buy-in method. For purposes of the example SDC calculation under the buy-in method shown in Table VII.2-1, the RCNLD valuation method has been used. The backbone component of pumping plant has been selected for purposes

Table VII.2-1 Illustrative example of the development of the SDC for a pumping plant using the buy-in method and RCNLD valuation approach for a ⅝-in. connection

Asset Description	Useful Life, Years	Years in Service	Original Cost	Cost Index	Replacement Cost Value	% Depreciated	% SDC Eligible*	Pump Station SDC Component
Pump Station 1	25	29	$541,075	1.97	$1,065,918	100	100	$0
Pump Station 2	25	19	1,352,780	1.61	2,177,976	76	100	522,714
Land	Land	N/A†	1,048,750	1.53	1,604,588	0	100	1,604,588
Pump Station 4B	40	10	777,615	1.37	1,065,333	25	100	798,999
Zone 3 Pump Station	40	2	1,397,100	1.04	1,452,984	5	50	690,167
Pump Station Improvements	35	1	580,675	1	580,675	3	100	563,255
Total								**$4,179,723**
Less: Outstanding Debt Principal on Pump Station Facilities								$(500,000)
Equals: Net Pump Station Value								$3,679,723
Divided by: Pump Station Capacity (mgd)								24
Equals: Unit Valuation of Pump Station ($/mgd)								$153,321.80
Divided by: 1,000,000 gallons ($/gpd)								$0.1533
Multiplied by: New ⅝-in. Customer Demand (gpd)‡								625.0
Equals: Pump Station Component Value of SDC								$95.83

*% SDC eligible reflects the amount of th facility to be included in the SDC calculation. The portions not included reflect c ntributions such as grants, contribution in aid of construction, etc.

†N/A = not available.

‡Assumes a new ⅝-in. customer uses 91,250 gallons of water per year, with a maximum-day peaking factor of 2.50, yielding a maximum-day demand of 625 gpd.

of illustrating the buy-in methodology. The RCNLD approach shown in Table VII.2-1 can be easily adapted to reflect the other valuation methods: original cost, original cost less depreciation, and replacement cost.

As can be seen, this methodology uses the original cost of the assets and their useful lives to develop the RCNLD value. The methodology also onsiders any ontributed assets (e.g., grant ;) that should be excluded from the SDC. In this example, the total depreciated replacement cost is calculated as $4,179,723. This valuation is reduced by outstanding debt principal associated and issued for the facilities, and the net value is then divided by the pump tation capacity to determine its unit value. The unit value of the capacity ($0.1533/gpd) is then multiplied by the amount of capacity needed by the new cu tomer (625 gpd). The example u es a ⅝-in. connection as the ba is for the calculation. Thi re ults in the pumping plant component of the SDC of $95.83 for a customer with a ⅝-in. connection.

The proce s used in this example must be repeated for each functional portion of the water sy tem that is to be included in the SDC calculation. It is important to note that the pumping plant example previously shown uses maximum-day capacity. Other plant components may use different design criteria (e.g., average-day use), and the calculated SDC should reflect the capacity (design criteria) required for that particular plant component. Once each component cost of the backbone sy tem has been calculated, they may be um-marized into a total net allowable SDC. Provided in Table VII.2-2 is an illustrative example of how this information may be summarized for a ⅝-in. connection. In this example, the total ⅝-in. SDC, after debt credits or other adju tments, is $2,454.18.

Table VII.2-2 Illustrative example of the summary of the net allowable SDC using the buy-in method and RCNLD valuation approach for a ⅝-in. connection

System Component	Gross SDC	Less: SDC Debt Credits	Net Allowable ⅝-in. SDC
Source of Supply	$1,048.25	($220.00)	$828.25
Treatment	1,845.90	(543.50)	1,302.40
Pumping*	108.85	(13.02)	95.83
Transmission	228.45	(55.65)	172.80
General Plant	54.90	0.0	54.90
Total	$3,286.35	($832.17)	$2,454.18

*Calculations are based on data contained in Table VII.2-1:

- Pumping Gross SDC is based on this calculation: [($4,179,723/24 mgd)/1 000,000] × 625 gpd.
- Pumping SDC Debt Credit is based on this calculation: [($500,000/24 mgd)/1,000,000] × 625 gpd.

Incremental Cost Method

The incremental cost method, also referred to as the marginal cost method, differs in perspective from the buy-in method. While the buy-in method uses existing assets for the valuation of the SDC, the incremental cost method assigns to new development the incremental cost of future system expansion needed to serve the new development. Generally, this method is considered most appropriate when the existing system does not have sufficient available capacity, and a significant portion of the capacity required to serve new customers must be provided by the construction of new facilities. When using this method, it is important to have a capital improvement plan (CIP) that identifies the costs associated with new capacity, the timing of the expenditure, and the proposed source(s) of funds for those capital improvements.

The incremental cost method is designed to equitably distribute these capital costs to new customers in proportion to the new customer's usage of the facilities and the investment required to develop the facilities. Similar to the buy-in method, the valuation of the incremental assets are developed, adjusted for any grants or other contributions, and then divided by the capacity (in gallons or gallons per day) to derive a cost per gallon on new facilities. The result is an SDC for new customers that reflects the capital costs associated with providing the capacity needed by customer growth. However, it is important to realize that under this method, as is the case for the buy-in method, there will typically be a cash-flow timing difference because the facilities have to be built (and financed) before new customers can connect to them.

There are a number of factors or considerations in establishing SDCs using the incremental cost method. To calculate SDCs according to the incremental cost method, the practitioner must determine, among various factors, the period of growth, growth rates, type of growth, capacity associated with the various improvements needed to serve the projected growth, and cost of these improvements. Provided in the following sections is a discussion of some of the key considerations along with an example.

Service area. The area to be served must be determined before the SDC can be computed. Commonly, the total service area of the utility system is used, but some utilities divide their system into separate service areas. Particular care should be used when dividing a utility system into subsets to ensure that the subsets are based on identifiable and significant cost-of-service differences from the system as a whole.

The delineation of the utility service area is important for growth planning and for assessing capital improvements needed for new development. Typical service areas are municipal corporate limits and public-utility-commission certificated or franchised

ervice areas. The inclusion of extraterritorial juri dictions may be appropriate where service is currently provided or the provision of service i imminent.

Municipalities that serve communities outside their border typically use one of the following approaches for calculating outside-city SDCs:

1. They do not charge outside-city customers an SDC.
2. They charge the same SDC charged to inside-city customers.
3. They charge a different SDC than inside-city customers based on specific customer demand estimates and identification of new facility and cost analysis for serving inside- ver u outside-city customer .

Outside-municipality surcharge are not recommended to be applied to an SDC. Such a surcharge could possibly make the total collected amount exceed the development's or entity's pro-rata hare of the infrastructure costs (i.e., the fee exceed the benefit cost); hence, it could potentially be challenged as a violation of case law pertaining to SDCs. There should be a nexus between the costs and the SDC charged.

Planning period. The SDC planning period is needed to project the growth and ervice requirements of the system. Though utilities have used various lengths of time for planning purposes, the planning period for determining SDCs is generally the same as the utility's standard planning period. This planning period is typically defined within their planning documents, but it usually range from 10 to 20 years for distribution and treatment facilities planning but may exc ed 50 year for water upply planning. Another criterion for determining a planning peri d i the financial cycle for long-term financing, which can typically be 10 to 30 year . Sometimes legi lation governs the length of the planning period.

Growth rate and magnitude of expansion. A projection of the future system growth is an integral part of the incremental co t method. Th rate and type (cu tomer class) of growth has a direct effect on the type of system expansion needed to serve new development over the planning period. Ideally, a utility's facility planning documents will provide the basis for much of this information.

Capital improvement plan for system expansion. Ideally, the capital improvements needed to meet ystem expan ion and growth will be provided within the utility's adopted master, comprehensive, or facility planning documents. The e adopted do uments provide a clea · connection between projected growth, sy tem planning criteria, and the needed improvements to erve future development. Some utilities will also have CIPs that segregate project between replacement project and capacity expan ion (i.e., growth-related) projects.

In reviewing the CIP, ome decisions may be needed regarding the proportion of an improvement that provides expanded capacity versus replacing existing capacity. While some capital improvements may clearly be 100 percent expansion related, the difficulty with replacement projects is that they may replace existing capacity and provide expanded capacity (e.g., a transmission line that is replaced but over ized for future growth and expansion). For replacement projects that provide expanded capacity, only the proportion of the project that provides new capacity is included within the SDC. The same situation may occur for improvement projects primarily driven by regulatory requirements (e.g., upgraded improvements at a water treatment plant). Again, if the improvement provide capacity for new customers, that portion of the improvement that provides new or additional capacity for growth and expansion may be included within the SDC.

SDC determination—incremental methodology. For purposes of the example SDC calculation under the incremental cost method shown in Table VII.2-3, it is presumed that an adopted comprehen ive water sy tem plan was used as the ource document for

Table VII.2-3 Illustrative example of the development of the SDC for a pumping plant using the incremental cost method for a ⅝-in. connection

Future System Improvement	Cost of Improvement*	% Expansion†	% SDC Eligible‡	Pump Station SDC Component
Pump Station 1 Expansion	$565,000	50	100	$282,500
Land	128,000	100	100	128,000
Pump Station 5	425,000	25	100	106,250
Zone 8 Pump Expansion	538,000	100	50	269,000
General Improvements	125,000	0	100	0
Total Pumping Improvements				**$785,750**
Divided by: Additional Capacity (mgd)§				4
Equals: Unit Valuation of Additional Pumping Capacity ($/mgd)				$196,438
Divided by: 1,000,000 gallons ($/gpd)				$0.1964
Multiplied by: New ⅝-in. Customer Demand (gpd)**				625.00
Equals: Pump Station Component Value of SDC				**$122.77**

*Improvements are stated in current-day dollars.

†Reflects the proportion of the project that provides expansion capacity.

‡SDC eligible reflects amount to be included in the calculation of the SDC and may exclude contributions such as grants, developer contributions, ad valorem tax payments, etc. It should als reflect the removal of any future costs that are related to the quality of service for old customers (better treatment) as well as the costs of any facilities that serve existing customers (replacement of a pipe with a larger one).

§Derived from planning documents.

**Assumes a new ⅝-in. customer uses 91,250 gallons of water per year, with a maximum-day peaking factor of 2.50, yielding a maximum-day demand of 625 gpd.

the assumed customer growth, planning capital projects, and the proportion of the projects that are related to providing system capacity expansion. Furthermore, although the improvements will be made in future years, the analysis uses current-day dollars for all plant costs.

As shown in Table VII.2-3, the SDC component for a pumping plant under the incremental cost method would be $122.77. The pump plant component of the SDC would be summed with the other backbone SDC components to determine the total ⅝-in. SDC.

In viewing Table VII.2-3, the approach is similar yet different from the buy-in approach (Table VII.2-1). According to this approach, the improvements have been identified within the comprehensive water system planning document. All the plant values have been placed in current-day dollars (i.e., any escalated values in the planning document are present valued to convert them into current-day dollars for pu poses of the SDC calculation). Next, a determination of the percentage of each project that provides capacity expansion, along with the percentage of the project that is SDC eligible, is made. Similar to the buy-in methodology, projects funded in part from grants, developer contributions, and so forth, may not be eligible for inclusion within the SDC calculation. The total eligible projects are summed then divided by the total capacity that will be added to the system. This allows a unit value of the additional capacity to be determined ($0.1964/gpd) and, when multiplied by the capacity needs of the future customer (625 gpd), the pump station component of the SDC is determined ($122.77).

Table VII.2-4 Illustrative example of the development of the SDC for a pumping plant using the combined cost method for a ⅝-in. connection

Capacity Item	Value	Capacity, mgd	Unit Value, $/mgd
Existing Capacity	$4,179,723	24.0	N/A*
Future Capacity	$785,750	4.0	N/A
Total	$4,965,473	28.0	$177,338.33
Divided by: 1,000,000 gallons ($/gpd)			$0.1773
Multiplied by: New ⅝-in. Customer Demand (gpd)			625.00
Equals: Pump Station Component Value of SDC			$110.84

*N/A = not applicable

Combined Cost Approach

The combined cost approach, as shown in Table VII.2-4, is, as the name implies, a technique for averaging the buy-in and incremental cost methods. The average is not a simple summed average, but rather, it is a weighted average. In the example illustrated in Table VII.2-4, it is assumed that the utility has capacity within the existing system that can serve growth but will also need to add capacity in the future to serve growth. In such cases, it is logical to base the SDC on the weighted average cost of the existing capacity and future capacity additions. By doing so, new customers pay an SDC that reflects the value of existing and planned capacity.

As was the case for the buy-in and incremental cost methods, the sample in Table VII.2-4 provides the pumping plant cost component for the SDC. In this case, using the combined cost method, the SDC for a ⅝-in. connection is $110.84. This is based on a unit cost of $0.1773/gpd and a customer demand of 625 gpd. A similar analysis should be done for the other functional areas of the system, and the sum of the component SDCs will result in the total allowable SDC for a new customer.

SDC Schedule Methods

The examples used in this chapter have determined an SDC for a new ⅝-in. connection. However, new customers will likely have different connection sizes and place different capacity demands on the system. Therefore, a utility must have a method of administering the SDCs that fairly and equitably reflect the capacity costs of the varying new customer capacity needs. There are four common methods for determining the SDCs for varying capacity requirements:

1. Meter size
2. Fixture units
3. Customer attributes
4. Estimated usage

Meter size. A common method for administering SDCs is based on meter size. One of the advantages of this method is that it is relatively easy to administer and explain to new customers. According to the meter size approach, SDCs for new customers increase as the size (capacity) of the meter increases. To accomplish this, an equivalent meter ratio is developed that expresses the capacity of larger meters in relation to the capacity of the utility's "base" meter size (e.g., a ⅝-in. meter).

Table VII.2-5 Meter equivalencies based on meter capacity and establishing SDCs by meter size using the buy-in method and RCNLD valuation approach

Meter Size	Maximum-Rated Safe Operating Flow, gpm*	Meter Equivalent Ratio†	SDC
⅝-in. Displacement	20	1.0	$2,454‡
¾-in. Displacement	30	1.5	3,681
1-in. Displacement	50	2.5	6,135
1½-in. Displacement	100	5.0	12,271
2-in. Displacement	160	8.0	19,633
3-in. Singlejet	320	16.0	39,267
3-in. Compound, Class I	320	16.0	39,267
3-in. Turbine, Class I	350	17.5	42,948
4-in. Singlejet	500	25.0	61,354
4-in. Compound, Class I	500	25.0	61,354
4-in. Turbine Class I	630	31.5	77,307
6-in. Singlejet	1,000	50.0	122,709
6-in. Compound, Class I	1,000	50.0	122,709
6-in. Turbine Class I	1,300	65.0	159,521
8-in. Compound, Class I	1,600	80.0	196,334
8-in. Turbine Class II	2,800	140.0	343,585
10-in. Turbine Class II	4,200	210.0	515,377
12-in. Turbine Class II	5,300	265.0	650,357

*Source: AWWA Standards: Displacement, C700-15; Singlejet, C712-10; Turbine Classes I and II, C701-12; Compound Class I, C702-10.

†Using standard maximum meter-flow capacity ratios (e.g., 2 in. = 160 gpm, 20 gpm (⅝ in.) = 8.0:1.0 capacity ratio).

‡⅝-in. SDC based on example presented in Table VII.2-2.

The equivalent meter ratio is used as the basis for the increased SDC for larger meters. For example, the safe operating capacity of a ⅝-in. meter i 20 gpm. In contrast, a 2-in. meter has a safe operating capacity of 160 gpm. Thus, on a capacity basis, a 2-in. meter is the equivalent of eight ⅝-in. meters, and the SDC for the 2-in. meter should be set at 8 times the ⅝-in.-meter SDC.

Table VII.2-5 provides an example for the development of SDC schedules based on a ⅝-in. meter as the base meter size. In this example, the base SDC is $2,454 or the amount calculated in the buy-in example displayed in Table VII.2-2.

As shown in Table VII.2-5, for each type of meter, there is a corresponding maximum-rated safe operating flow. This provides the basis for the meter equivalency ratios. These ratios are then multiplied by the base cost SDC ($2,454) to provide a schedule of SDCs for new customers connecting to the system. For example, a cu tomer with a 2-in. meter would be charged $19,633, since the capacity of a 2-in. meter is eight times that of a ⅝-in. meter. Stated another way, a customer with a 2-in. meter has the capacity of the equivalent of eight ⅝-in. meters. The manufacturer specifications of the actual meters used by a utility may also be used to develop meter equivalency ratios.

One of the disadvantages of the meter size approach is that for larger meters, the meter capacity may not be a reasonable indicator for the actual capacity demand of the customer. It should be remembered that the $2,454 SDC for a ⅝-in. connection reflec the usage patterns of that size meter (i.e., a residential customer with a ⅝-in. meter).

A new customer with a larger connection ize—for example, an industrial customer with a 6-in. meter—may use far more capacity than shown in Table VII.2-5 for a 6-in. meter. Therefore, an individual determination of the number of equivalent units or capacity requirement may be appropriate.

Fixture units. The fixture unit approach is based on a count of the fixture units (water-using devices like toilets, dishwashers, etc.) of the dwelling or building. This method is commonly used for unmetered customers. The basic concept of this approach is that each water-using fixture of the building is equal to a specified volume tated in gallons per day and that can be equated to an equivalent residential unit (ERU). The values for each fixture unit of the building are then summed, and the total ERUs for purpo es of establishing the SDC can be determined.

Customer attributes. The attributes method for determining ERUs is based on the type of establishment and standardized usage characteristic for certa'n busine s attributes rather than meter size or fixtures (plumbing) of the new structure. For example, the capacity of a restaurant may be based on the number of permitted seats, or the capacity of an office based on quare feet of the office building. The advantage of the attributes method i that it may be a better indicator of actual u e compared to a fixture or meter equivalent approach that doe not con ider how the facility will be used. However, one downside is that compared to fi tur counts or meter size, the attributes method can be more administratively burdensome, especially when involving the redevelopment of property. For example, under the attributes method, additional SDCs may be required for the redevelopment of a particular property even if there is no change in meter size or overall number of plumbing fixtures compared to the original development on the property. Under the attributes method, there may be difficulty in urveying the capacity requirements associated with different types of nonresidential establishments (some may not be easily categorized). Therefore, customers of the same type could have different plumbing configurations, resulting in differences in potential demand.

Estimated usage. This approach is often used by utilities to establish the SDC for new customers needing a meter size that i larger than a certain threshold (e.g., larger than 2 in.). In these cases, for new connections up to the thre hold size, the utility will use the meter size, or other tandard approach. Then, for meter larger than the threshold, the utility will estimate the capacity needs of the new cu tomer and base the SDC on those estimates. Ideally, the utility will have other similar customers with historical data on which to make the e timate.

Credits for "green" initiatives. Utilities should consider the applicability of SDC credits for cu tomers that may have lower demand on the water sy tem due to low-flow toilets or the structure of their facilities. Cu tomers that have achieved Leadership in Energy and Environmental Design certification often have water-conserving fixtures throughout the applicable building(s). In these situation , it may be appr priate for the utility to provide an SDC credit that is proportionate to the reduced system demand compared with the demand of a standard unit if the reduced demand can be verified.

Review or true-up of SDC. Some utilitie , within their adopted SDC ordinance or resolution, provide for the ability to review capacity use of customer with larger connections after a specified period of time after which a baseline of historical usage has been established. With this review comes the opportunity to true-up the SDC payment based on the baseline consumption data. In some cases where estimated usage is used to determine the customer's SDC, the utility may consider a true-up to th SDC after some reasonable time period of historical usage that has allowed for a clearer under tanding of the customer' patterns of use. The u e of such a true-up should be evaluated based on any applicable legal/legislative requirement governing the asse sment of SDCs.

Timing of SDC assessment and collection. Another factor that hould be considered when selecting the SDC schedule approach is the timing of the SDC assessment and

collection. Depending on when the SDC is assessed and collected, it may be possible that the data required for one or more of the four approaches will not be available. However, if the SDC is collected at the time of building permit issuance or service initiation (e.g., at the time the meter is set), the data for any of the four approaches would be available; therefore any one of them could be selected. The e timated usage approach involves additional collection steps in cases where the customer's usage during the monitoring period demonstrates the need to collect an incremental SDC. When the monitoring period extends over years, it is possible that the utility may find itself dealing with customer turnover at the service location. Again, the determination of when the SDC may be assessed and/or collected may be governed by local or state requirements.

OTHER SDC TECHNICAL AND ADMINISTRATIVE ISSUES

While the previous discussion and examples have provided an overview of the development of SDCs, there are many other technical and administrative issues associated with SDCs.

SDC Revenue (Debt) Credits

SDC calculations should consider the applicability of credits for capital costs that ar embedded in system revenue requirements (e.g., outstanding debt) and will be recovered through user rates. Typically, this credit is for the debt related to capital expansion proj ects. As such, the debt credit adjusts the SDC to avoid collecting capital costs through th SDC and then again through water rates.

As noted previously, determination of SDCs differs significantly from user rate development because of the prevalence of enabling legislation, which in many states is prescrip tive. This is specifically true with respect to revenue credit calculations, and the credi calculation may include items such as growth-related debt service embedded within u fees, taxes, assessments, and intergovernmental transfers. Accordingly, it is important t review applicable legislation and recognize that what is appropriate in one state or prov ince may be invalid in another.

In general, there are several options for the calculation of revenue credits, each which should be reviewed for conformance with applicable legislation and each with r ative advantages and disadvantages. The applicability of revenue credits may depend o the costs included in the SDC calculations (e.g., capital costs plus interest/financing cos or only capital costs) and how the utility uses its SDC collections. For example, if SDCs a used to directly pay for project costs, reducing the amount of debt financing required, debt credit may not be applicable.

Outstanding debt principal. One approach for making revenue adjustments an to prevent double recovery of debt-related co ts (or other credits) in calculating SDCs is deduct the outstanding debt principal balance from the cost basis used in the calculatio of the unit costs of capacity. By doing so, SDCs do not recover costs that will potentiall be collected from the new customer in future water rates (i.e., debt service within the re enue requirements and user rate). According to this approach, the amount of the cred will decrease as the principle of the debt is repaid through rate revenue. Thus, in order f the SDC to continue reflecting the cost of capacity, the credit needs regular adjustmen The primary advantage of using the outstanding debt principal approach is its simplici and transparency.

Present value of revenue payments. The present value approach is another meth for calculating revenue credits. This approach is used when the credit will be applied the total SDC calculation as opposed to the components. It is based on a deduction of t

present value of new cu tomer debt-service payments that will be included in future water rate charges paid by new customers.

The present value approach can be complex because of the need to determine whether the present value analysis is done for total debt-service payments (principal and interest) or just principal payments, and related to this decision is the selection of the proper discount rate. Another consideration is whether there are specific jurisdictional (e.g., state) legal requirements for the calculation of the e credits.

Utilities often incur debt to defray the costs of capacity-expanding improvements (both existing and future improvements). To pay the annual costs of debt service, agencies often rely on customer rates but may use other revenue sources including system development charges. If SDCs are utilized to fund debt service, then interest and financing costs can be included to derive the charges. The utility would simply add such cost to the capital or system improvement costs in its SDC calculation proces . If customer rates are used to fund debt-service payments, in whole or in part, debt-service credits to SDC calculations should be considered to avoid the potential of charging a connection twice for the same cost of capacity-expanding system improvements.

In ome SDC calculations, both prin ipal and interest payments are considered as legitimate expenses. Principal is included because it is capitalized into existing facilities, and interest costs are considered given that they are costs that are recovered by existing and future ratepayers through their regular user rates. The question then becomes one of methodology used to include these financing costs. One approach advocates the simple summing of future interest costs, reducing them to a unit value (e.g., per-gallon basis) and deducting from the gross SDC calculated amount. Another approach takes the net present value of future interest costs discounted at an appropriate rate to determine the unit cost of credit. This is a more widely used approach in the calculation of SDC debt-service credits. The rate utilized would be a discount rate. The discount rate converts the future stream of financing costs into their value in current terms. The question of what discount rate to use is one where utility finance professionals often disagree. One approach is to use the cost of debt issued to finance the system improvements. Another approach is to set the discount rate at the real interest rate of the debt issued for uch improvements (nominal rate less an inflation rate). The argument made to support the use of the real rate is that it appropriately reflects the opportunity cost of the utility's investment dollars that could have gone to other uses (albeit other u es for a single-purpo e utility are limited, whereas there are other considerations in a municipality that owns and operates a utility).

Outstanding bond payments as well as future bond payments linked to planned capital projects would be considered in the present value analysis. If future bond payments are considered, e timations will have to be made on the terms of the potential financing. In addition, the utility should be confident that the bond ale will occur at the specified time as considered in the SDC analysis. Delays in the is ue date, construction amount, or other terms of the issue will have an effect on the output of the present value analysis.

Use of SDC Receipts

SDCs can be a major source of funding for financing growth-related projects that limit the amount of new debt needed, or in the alternative, for making debt- ervice payments on past growth-related debt. A utility desiring to use SDC receipts for debt-service payments should use caution because customer growth may not be stable or consistent over time. Therefore, the SDC receipts in any single year may be significantly deficient when compared to the debt-service payments. In cases where SDC receipts are used for debt-service payments, the utility should be proactive and adopt written financial policies that outline the preference for using the SDC receipts for debt-service payments and identify the alternative funding sources that may be available should growth and the SDC receipts not

materialize as expected. It is prudent to not rely solely on SDC receipts for debt-service payments but rather to protect against the growth risks by identifying other sources, such as transfers from reserve funds, water rates, or contributions from the general fund (e.g., property taxes) that can be used when SDC receipts are insufficient in meeting debt-service requirements.

Reimbursement Policies

Reimbursement contracts are sometimes used by water utilities for infrastructure contributions. These contracts typically provide for reimbursement of some contributed facility costs from SDCs collected from future customers who will use the contributed facility. Limitations on the amount of, and the time period for, reimbursement should be included in the contracts. For example, reimbursements may be limited to a period of 10 years after the contribution and limited to the same system component (i.e., source, treatment, distribution, or transmission) of the SDCs collected in the service area of the contributed facilities. Reimbursement contracts should clearly explain the formulas for determining credits and/or refunds, and for administrative reasons, excessively complex formulas should be avoided. Simplifying solutions, such as much smaller but up-front reimbursement for a portion of the contributed asset, can be far preferable to contracts requiring management over many years.

Timing of SDC Assessment and Collection

The timing of collection involves two conflicting issues that must be reconciled. First, the utility needs to collect SDCs early enough for the SDC program to make a meaningful improvement in the availability of funds for system improvements. Second, the utility can accurately assess the SDC only later in the development process, when the actual meter size or number of fixture units is known. In some cases, SDCs are charged at the time the plat is approved, but more common is the assessment and collection of SDCs at the time the building permit is issued or at the time service is provided (e.g., when the meter is set or when a certificate of occupancy is issued during the development process). The utility must determine what it considers to be the "trigger" for assessing and collecting it SDCs. In making this type of decision, utilities and their governing bodies should be aware that deferring collection of the SDC to later in the development proces shifts some of the speculation risk from the developer to the utility. Deferral of SDC collection extends the cash-flow timing issue mentioned previously in this chapter and puts existing utility customers in the position of investing up-front for potential new customers that may take longer than expected to materialize. This decision is essentially the same choice as determining to whom SDCs are charged and when the charge should occur. Utilities apply SDCs in several ways, triggered by several conditions, including

- creation of a new plant,
- issuance of a building permit,
- application for new service,
- application for additional service, and
- provision of new service.

Alternative SDC Calculation Procedures

It is important for utilities to have an adopted, official procedure for applicants to submit an alternative SDC calculation—this may be required by state law. If an applicant belie that the nature, timing, or location of a propo ed development would make it likely to

generate impacts costing less than the amounts calculated under the utility' current methodology for determining the number of ERUs, the applicant has the right to ubmit an alternative SDC calculation—prepared and certified by a qualified profes ional in the utility industry under generally accepted methods—often to the utility director or ity/ county manager (or his/her designee). The purpose of the alternative SD fee calculation is not to simply witch one accepted ERU determination methodology for another, but to present compelling evidence that the ERU calculations under the current methodology significantly overstate the applicant's capacity demand. If the calculation is not accepted, the applicant may appeal to the governing board, commission, or council.

The applicant i often expected to pay in full the SDC calculated under the utility's current methodology in advance of the alternative SDC review. The utility may have the option of charging a nonrefundable alternative SDC review fee. The alternative SDC review policy should specify the time frame of the various stages of review (e.g., utility director will complete review within days).

If the alternative SDC calculation is accepted, the utility should still reserve the right to true-up the calculation based on the actual use of the development once connected to the system, as it is important that each customer pay its fair hare of the demand for the utility' capacity. If actual consumption during a specified period (e.g., 24 months) after initiation of ervice reflects a greater demand on the water facilities than what was represented in the alternative fee calculation, the utility should retain the right to increase the total amount of SDCs collected from the applicant.

There are several examples of alternative SDC calculation procedures available in city and county ordinances. Utilities that have not yet established a formal procedure can reference those of peer and derive one that fits their organization.

SDCs and Private Fire Protection

SDCs are often established in relation to the size of the meter being installed. An issue being considered by the utility industry i how to fairly a es SDCs when a customer requires an oversized meter due to tandby (fire prot ction) capacity, which may never be required or u ed over the life of the building structure.

ADMINISTRATIVE AND ACCOUNTING POLICIES AND PROCEDURES

The utility hould adopt general administrative and accounting procedures to ensure that the SDC collections are managed and used for the facilitie needed to provide service to new development in the utility's service area. Some statute require all such funds to be used for the specific facilities that the SDCs were designed to finance. (A utility should always maintain documentation howing how the exi ting SDC were derived.) SDC funds should be identified and segregated from the utility's unre tricted a sets. To avoid pending a large portion of revenues on administration, the utility may find it helpful to fir t document the current development process and try to integrate the SDCs into the exi ting organization. In no case should SDC funds be u ed to fund annual O&M expenses.

Administrative Issues

Utility managers should develop pr cedures to administer the SDC program, including establi hing a process for hearing appeals and exception to the SDC policie and procedures. In the case of regulated utilities, the regulatory authority may oversee thi proce . The multitude of development and contribution scenarios requires some procedure for dealing with unusual circumstances.

Customer notification requirements. Some state (e.g., Florida as of the date of this manual's publication) have a requirement that notice must be provided within a certain time frame (e.g., 90 days) before the effective date of an ordinance or resolution imposing a new or increased SDC. However, the waiting period may not apply if the SDC is being decreased, suspended, or eliminated. As a courtesy to the development community, the utility can make full use of various media (e.g., newspapers, public announcements, letters, Internet) to communicate changes in fees as well as to explain any justification for the changes.

Refunds. The utility should consider refunds of SDCs under the following circumstances (note that refunds may be required in some states under different circumstances):

- When service is not provided in a reasonable period of time after the charges are paid.
- When collected charges are not spent on system expansion (or projects that the SDC calculations are based on) within a reasonable time period.

These provisions, or similar thereto, are sometimes included in enabling legislation.

Interest income. The utility should dedicate interest income from SDCs to the SDC accounts. This helps to offset inflationary cost increases for system expansion projects. In most jurisdictions, such dedication of interest income is a legal requirement.

Income taxes. For investor-owned utilities, SDCs are generally included as ordinary taxable income for federal tax purposes.

Regulatory issues. When etting water rates using the utility basis for determining revenue requirements, most regulatory commissions exclude contributions of facilities and the related depreciation on contributed assets from the rate base in the rate-making process. Generally, SDCs are considered as an offset to plant investment in determining the rate base. Typically, any income tax liability generated from the collection of SDCs would be included in the rate base to determine rates for an investor-owned utility, unless such liability is already included in the SDC.

Maintenance of expansion-related debt factor or percentage. SDC can typically be used to make principal and interest payments on growth- or expansion-related debt. Therefore, it is important for uti rcentage of annual debt-service requirements that are expansion related and, hence, eligible to be paid with SDCs.

Ideally, the utility should have detailed accounting of how each dollar from debt proceed was spent. Table VII.2-6 contains a sample debt-service expansion percentage calculation. As the debt mix of the utility changes, the debt expansion percentage calculation should be updated as appropriate.

Accounting Issues

Collection records. Because SDCs are imposed to recover some or all of the cost of new development, proper accounting of receipts is important to document authorized use of those funds. Assessment and collection records should be maintained by individual lot if SDCs are collected at the time of platting. This practice require accounting for each new lot in all subdivisions. Assessment at the time service is requested requires accounting for SDC by service connection. With this approach, collection of SDCs is similar to regular cu tomer service accounting.

Receipts. The utility hould account for SDC receipts with the same procedure used for contributed facilities. Specifically, SDCs should not be included as a part of general operating revenues. SDCs should be used for capital-related purposes, including either retiring debt or constructing capital facilities related to system growth.

Table VII.2-6 Sample debt-service expansion percentage calculations

Project Analysis for Each Debt Issue:

Bond Issue 2

Project	Amount Borrowed	Expansion	Water System Projects: Expansion Related	Water System Projects: Non-Expansion Related
Expansion of the Reverse Osmosis Water Treatment Plant	$18,000,000	100.0%	$18,000,000	
Water Main Rehabilitation	6,000,000	0.0%		6,000,000
New Water Transmission Main	8,000,000	100.0%	8,000,000	
New Wells	3,000,000	100.0%	3,000,000	
Pump Station Rehabilitation	1,000,000	0.0%		1,000,000
Total	$36,000,000		$29,000,000	$7,000,000
Percentage of Total				19%

Calculating Overall Debt-Service Expansion Factor:

Outstanding Debt Issue	Total Debt-Service Payments 2012	Allocated Water System Debt Service	Water System Expansion	Expansion-Related Debt Service
Bond Issue 1	$9,927,500	$5,410,488	95%	$5,139,963
Bond Issue 2	2,458,944	2,458,944	81%	1,980,816
Bond Issue 3	14,249,788	10,259,847	72%	7,387,090
State Revolving Fund Loan 1	1,246,301		N/A	N/A
State Revolving Fund Loan 2	1,524,424		N/A	N/A
Total Payments	$29,406,957	$18,129,279		$14,507,869
Overall Expansion-Related Debt-Service Factor				80%

N/A = not applicable

Expenditures. SDCs should be expended in a manner consistent with the financial goals and basis for which the charges were established. Expenditure accounting for SDC should be maintained to support the revenues derived from the charges.

Restricted fund. A restricted fund should be established for capital improvements funded by SDCs to facilitate the accounting of the income and expenditures for the capital improvements.

BEST MANAGEMENT PRACTICES

It is advisable for utilities to prepare for the cyclicality and timing of SDC collection by maintaining a strong financial position and high credit rating as well as adequate cash reserves for capital spending. There are often significant differences in timing among a utility's capacity construction schedule, the dates on which the capacity becomes available, and the receipts of SDCs from the new growth to be served by such capacity. Since SDC collections can be one of the utility's most unpredictable revenue streams and can vary significantly with changes in the economy, the utility should not be overly dependent on SDCs to fund its expansion program. Sometimes utilities issue debt to fund growth-related projects and then expect the SDC collection stream to pay the annual debt service. Although this strategy may result in lower user rates during periods of high growth, SDC

collections are likely to diminish during economic downturns, requiring the debt service to be paid with user rate revenues. In this situation, significant additional user rate increases may be required to meet rate covenant .

To manage the timing of cash flows associated with an expansion program, a utility should maintain a strong system financial position to enable the utility to secure optimal credit ratings that typically lead to lower interest rates on debt financings. In addition, the utility should maintain adequate cash reserves for capital spending to serve as working capital for the expansion program. Credit rating agencies (i.e., Moody's Investors Service, Standard and Poor's Financial Services, and Fitch Ratings) frequently publish their criteria for evaluating the creditworthiness of utilities. High credit ratings are typically linked to strong debt-service coverage ratios and favorable cash positions. Because of the greater unpredictability of SDC collections versu: user rate revenues, the rating agencies place more value on the all-in net revenues debt-service coverage ratio (net revenues divided by the sum of senior and subordinate lien annual debt service) calculated without SDCs (i.e., due to lower financial risk). Therefore, the utility's user rates should ideally be set at a level to achieve operating margins that result in strong all-in net revenues debt-service coverage and allow the utility to fund its apital needs—including those related to growth—through a mixture of debt and pay-as-you-go financing. If the utility's net revenues without SDCs can pay all system debt service plus provide strong coverage, and if the utility has adequate working capital for capital spending, the utility hould be in a good position to handle fluctuations in SDC collections.

UPDATES OF THE SDC ANALYSIS

As development occurs and the economic mix of the community that the utility serve changes, growth and development assumptions may also change. Similarly, the facilities needed to serve customers will transform over time, and the costs associated with these facilities will be different from the past. As thi occurs, the utility may update its master plan, comprehensive plan, or facility plan, which typically provides the basis for many key assumptions used within the development of the SDCs. Because of these changes, utilities need to, on a periodic basis, reassess their SDC assumptions and compare the historical development, capital spending, and capacity utilization levels achieved with that originally planned or projected. Legislation may also govern how often SDC assumptions and calculations should be reviewed.

SDCs are not typically as sensitive to annual changes in customer demand as are water rates, but it is still appropriate to update SDC calculations to ensure that they remain at appropriate levels. It is recommended that utilities review their SDC calculation

- at least every five years;
- when major capital improvements (expansion or upgrade) are proposed for the water system;
- when policymakers are reviewing the reasons for the underlying methodologies;
- when a significant change occurs in capacity usage, demand forecasts, or in capital planning; and
- when required per governing legislation.

Depending on local laws and for short-term administrative convenience, SDCs may be adjusted on an annual basis using a construction cost index or other reasonable indices to refle t the time value of money. This is particularly appropriate when the initial cal u-lation of the SDC has valued the costs in current-day dollars.

REFERENCES

AWWA (American Water Works As ociation). 2009. C700-15 *Standard for Cold-Water Meters—Displacement Type, Metal Alloy Main Case.* Denver, Colo.: AWWA.

AWWA (American Water Works Association). 2010a. C702-10 *Standard for Cold-Water Meters—Compound Type.* Denver, Colo.: AWWA.

AWWA (American Water Works Association). 2010b. C712-10 *Standard for Cold-Water Meters—Singlejet Type.* Denver, Colo.: AWWA.

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Nelson, A.C. 1995. *System Development Charges for Water, Wastewater and Stormwater Utilities.* Boca Raton, Fla.: CRC Press. pp. 16–19.

CA Exhibit CDK-2

LIMESTONE WATER UOC, WATER & WASTEWATER SERVICE TARIFF, RATE SCHEDULES, ORIGINAL SHEETS #3-6, EFFECTIVE 5/1/2025

SCHEDULE OF RATES & CHARGES – WATER SERVICE (PHASE 1 of 2)

Availability: This rate is available to water customers located at the following systems:

Aqua Utilities

For Metered Service

Monthly Minimum (Includes 1,000 gallons)

For service through all meter sizes $31.00 / month

Commodity Charge: $3.05 / 1,000 gallon

Availability: This rate is available to water customers located at the following systems:

Candlewood Lakes

For Unmetered Service

Monthly Minimum: $55.00 / month

Non-Recurring Charges:

Service Connection/Tap Fee Charge:	Actual Cost
Disconnection Charge:	$35.00
Reconnection Charge:	$35.00
Returned Check Charge:	$16.00
Late Payment Charge:	5%
Meter Tampering Penalty Fee	$250.00

SCHEDULE OF RATES & CHARGES – SEWER SERVICE (PHASE 1 of 2)

Availability: This rate is available to sewer Customers located at the following systems:

Aqua Utilities

Residential: **Monthly Minimum (Includes 1,000 gallons)**

For service through all meter sizes $35.00 / month

Commodity Charge: $3.05 / 1,000 gallon

Commercial: Monthly Flat Rate per Equivalent Residential Unit*:

Monthly Rate: $9.32 / month

Availability: This rate is available to sewer Customers located at the following systems:

Grassland

Residential:

1-2 Bedroom	$65.00 / month
3 Bedroom	$70.00 / month
4 Bedroom	$75.00 / month
5 Bedroom	$75.00 / month

Commercial: Monthly Flat Rate per Equivalent Residential Unit*:

1-2 Bedroom:	$68.59 / month
All Else:	$191.45 / month

Availability: This rate is available to sewer Customers located at the following systems:

Arrington/Hardeman/Hideaway

Residential:

All: $75.00 / month

Commercial: Monthly Flat Rate per Equivalent Residential Unit*:

Monthly Rate: $191.45 / month

Availability: This rate is available to sewer Customers located at the following systems:

Chapel Woods

Residential:

All: $40.00 / month

Availability: This rate is available to sewer Customers located at the following systems:

Shiloh Falls

Residential:

All: $25.00 / month

Commercial: Monthly Flat Rate per Equivalent Residential Unit*:

Monthly Rate: $55.60 / month

Availability: This rate is available to sewer Customers located at the following systems:

Lakeside Estates (DSH)

Residential:

All: $55.00 / month

Commercial: Monthly Flat Rate per Equivalent Residential Unit*:

Monthly Rate: $29.99 / month

Non-Recurring Charges:

Service Connection/Tap Fee Charge:	Actual Cost
Disconnection Charge:	$35.00
Reconnection Charge:	$35.00
Returned Check Charge:	$16.00
Late Payment Charge:	5%

*Equivalent Residential Units ("ERU's") have been assigned to each Commercial Customer utilizing typical wastewater flow rates derived from the Tennessee Department of Environment and Conversation "Plans Review and Approval of Sewage Works Construction Plans and Documents".

CA Exhibit CDK-3

LIMESTONE'S RESPONSES TO THE CONSUMER ADVOCATE'S FIRST SET OF DISCOVERY, CA DR1-2

b. Limestone Water designed the carrying cost surcharge to recover the approved carrying charges within a single year because the surcharge amounts are modest and recovering the carrying charges over a one year period ensures that the surcharge drops off customer bills in a timely manner once the approved carrying costs have been fully recovered. Under the proposed design, the monthly surcharge equates to approximately $1.24 for water customers and $1.67 for sewer customers.

c. The calculation is consistent with the Commission's directive because Limestone Water applied the Commission approved rate of return to the remaining unrecovered revenue deficiency for the period during which Phase 1 rates were in effect and recovery was deferred. The surcharge is a mechanical recovery of those carrying charges and does not modify any Commission approved methodology.

d. Yes. Limestone Water intends to terminate the carrying cost surcharge once the total approved carrying charges of $54,348.01 have been recovered. The surcharge is not intended to be permanent and will be removed from customer bills upon full recovery of the carrying charges.

1-2. **Source & Support.** Refer to the following documents filed on March 2, 2026:

- Direct Testimony of Aaron Silas at 8:17 – 9:2; Exhibit "AJS-3: Proposed Phase 2 Rate Design."
- Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tabs "AJS 3 Rate Design Phase 2" and "Confidential Commercial ERU Data."

In the referenced testimony, Mr. Silas states:

> As stated in the tariff, "Equivalent Residential Units ("ERUs") have been assigned to each Commercial Customer utilizing typical wastewater flow rates derived from the Tennessee Department of Environment and Conservation 'Plans Review and Approval of

> Sewage Works Construction Plans and Documents." This methodology provides a standardized and Commission-approved basis for assigning ERUs to commercial customers based on expected wastewater usage.

Respond to the following:

a. Provide the values for each component and calculations or analysis used to determine the ERU for each customer.
b. If the ERU was estimated, provide the values used to create the estimate.

RESPONSE:

a. The values and calculations used to determine the Equivalent Residential Units ("ERUs") assigned to each commercial customer are provided in the Company's Phase 2 filing. Specifically, the tab labeled "**Confidential** Commercial ERU Data" in the file CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx identifies, for each commercial customer, the facility type, applicable design basis, typical flow assumptions, and resulting ERU multiplier used in the Phase 2 rate design.

In addition, Attachment 1-2 provides a reference table summarizing the design basis, typical flow values, ERU multipliers, and source documents by facility type, consistent with the methodology described in the Company's tariff and testimony.

b. All such values can be found in the "**Confidential** Commercial ERU Data" tab of the Phase 2 Excel spreadsheet.

1-3. **Source & Support and Explanation.** Refer to the following documents filed on separate dates with TPUC:

- Direct Testimony of Aaron Silas at 9:15,10:16 – 11:2, Exhibit "AJS-3: Proposed Phase 2 Rate Design" (March 2, 2026).

CA Exhibit CDK-4

LIMESTONE'S RESPONSES TO THE CONSUMER ADVOCATE'S FIRST SET OF DISCOVERY, CA DR1-4

assigned ERUs based on seats, alleys, or other non-usage measures. In those cases, water usage data would not reliably estimate the applicable design basis.

e. Please see the **CONFIDENTIAL** attached emails as well as the Company's response to subpart (i) for all available communication between 5.1.2025 and 3.2.2026.

f. Please see the **CONFIDENTIAL** attachment for all account logs between 5.1.2025 and 3.2.2026.

g. The values in Columns K and L did not change because those values were updated prior to the March 2, 2026 filing. Column K therefore reflects the most current information in the Company's billing system at the time of filing.

h. Any other changes to customer specific values reflected in the Phase 2 filing are captured in the **"Confidential Commercial ERU Data"** tab. The Company did round down when implementing the ERUs for the sake of flat values.

i. Limestone has produced the attached **CONFIDENTIAL** log of customer contacts responsive to this request. The attachment reflects customer service and billing system records identified by searching for inquiries relating to or containing the terms "rate inquiry," "rate increase," and "ERU." Entries unrelated to rate or ERU inquiries were excluded. The produced log reflects Limestone's records of customer contacts regarding rates or rate changes since implementation of Phase 1.

1-4. **Source & Support and Explanation.** Refer to the following documents filed on March 2, 2026, with TPUC:

- Direct Testimony of Aaron Silas at 12:5-9; Exhibits "AJS-3: Proposed Phase 2 Rate Design" and "AJS-3: Proposed Phase 2 Rate Design."

- Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tabs "AJS 3 Rate Design Phase 2" and "Confidential Commercial ERU Data."[4]

In the referenced testimony, Mr. Silas poses the following question and response:

> **Q.** HAS LIMESTONE INCREASED ANY COMMERCIAL ERU ASSIGNMENTS SINCE THE IMPLEMENTATION OF PHASE ONE?
>
> **A.** No. Any proposed increase to any commercial ERU assignment will be submitted to the Commission for review and approval.

Provide responses to the following:

a. On Exhibit AJS-3, for Commercial Customers, reconcile 2025 Actual Determinants, Column I, (approximately 381 (monthly)) with the Phase 2 Attrition Determinants, Column M (approximately 514 (monthly)). Explain the increase in the number of determinates, specifically, what caused the increase?
b. On Exhibit AJS-3, explain and provide the values that resulted in the increase of 1,023 determinates from actual to Phase 2 for Cartwright.
c. Explain and provide the values that resulted in the increase of 587 determinates from actual to Phase 2 for Lakeside Estates.
d. Will the billing ERUs be based on 2025 Actual Determinates or the Phase 2 Attrition Determinates?
e. Reconcile the increase (and changes) in the ERU Values in Exhibit AJS-3 with the statement that Limestone has not increased any commercial ERU assignments since the implementation of Phase 1.
f. Confirm that the Phase 2 Proposed Rate increases rates by as much as 40% for some residential customers (Cartwright - Arrington/Hardeman/Hideaway -Res Phase 1 Rate of $75, Phase 2 Proposed rate of $105.08) and as much as 195% for some commercial customers (Shiloh Falls – Commercial: Phase 1 Rate of $55.60 and Phase 2 Proposed rate of $163.92). If this is not confirmed, explain why it is not confirmed and the actual rate increases.

RESPONSE:

a. The difference between the 2025 Actual Determinants in Column I and the Phase 2 Attrition Determinants in Column M reflects updates identified through the ERU assignment review process described on pages 8–11 of Mr. Silas' Direct Testimony.

[4] *Id.*

The Phase 2 attrition determinants incorporate updated customer and facility information obtained after Phase 1 implementation and reflected in the tab labeled **"Confidential Commercial ERU Data."**

b. For Cartwright Creek, the increase of approximately 1,023 determinants from actuals to Phase 2 is primarily attributable to three customers: two schools and one country club. With respect to the schools, Limestone initially applied a one-half multiplier to the applicable design basis. Because the Commission's Final Order did not provide direction to apply such a reduction, the Phase 2 filing reflects elimination of the one-half multiplier and application of the full design basis. The remaining increase is attributable to updated information for a country club that maintains multiple accounts with Limestone, resulting in revised ERU calculations. Collectively, these three customers account for approximately 888 of the determinant increase.

c. The increase of approximately 587 determinants for Lakeside Estates results from updated information regarding multiple vacation rental and short-term lodging properties. Limestone obtained updated guest capacity information indicating that certain properties can accommodate more occupants than originally reflected, which increased the associated ERUs. These updates are reflected in the Phase 2 attrition determinants and detailed in the **"Confidential Commercial ERU Data"** tab.

d. Billing under the proposed Phase 2 rates is based on the Phase 2 attrition determinants, consistent with the Commission's directive to utilize the latest available billing determinants for Phase 2 implementation.

e. Limestone has not increased any commercial ERU assignments since the implementation of Phase 1. The proposed changes reflected in Exhibit AJS3 are the

CA Exhibit CDK-5

[PUBLIC]

LIMESTONE'S RESPONSES TO THE CONSUMER ADVOCATE'S FIRST SET OF DISCOVERY, CA DR1-18

1-18. **Source & Support.** Refer to Company's filing on March 2, 2026, Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tab "CONFIDENTIAL Commercial ERU Data." The referenced spreadsheet provides the ERU billing determinant support for commercial customers. Provide the support for the "Units (Design Basis)" data shown in Column G for each commercial customer.

RESPONSE: The "Units (Design Basis)" values shown in Column G of the **CONFIDENTIAL** Commercial ERU Data tab are supported by the attached documentation.

1-19. **Source & Support.** Refer to Company's filing on March 2, 2026, Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tab "CONFIDENTIAL Commercial ERU Data." This spreadsheet provides the ERU billing determinant support for commercial customers. Provide the support for the "ERU" data shown in Column K for each commercial customer.

RESPONSE: The ERU values shown in Column K of the ***CONFIDENTIAL*** *Commercial ERU Data* tab are derived from the applicable design basis units and the commercial ERU reference table. Specifically, the design basis information supporting the underlying units is provided in response to DR 118, and those units are converted to ERUs using the commercial reference table provided in response to DR 12.

1-20. **Source & Support.** Refer to Company's filing on March 2, 2026, Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tab "CONFIDENTIAL Commercial ERU Data" that was included with the

CA Exhibit CDK-5

[CONFIDENTIAL]

FILE <CONFIDENTIAL 1-18 Design Basis Support (1).xlsx>, TAB “Sheet 1”

CA Exhibit CDK-6

[PUBLIC]

LIMESTONE'S RESPONSES TO THE CONSUMER ADVOCATE'S FIRST SET OF DISCOVERY, CA DR1-3

> Sewage Works Construction Plans and Documents." This methodology provides a standardized and Commission-approved basis for assigning ERUs to commercial customers based on expected wastewater usage.

Respond to the following:

a. Provide the values for each component and calculations or analysis used to determine the ERU for each customer.
b. If the ERU was estimated, provide the values used to create the estimate.

RESPONSE:

a. The values and calculations used to determine the Equivalent Residential Units ("ERUs") assigned to each commercial customer are provided in the Company's Phase 2 filing. Specifically, the tab labeled "**Confidential** Commercial ERU Data" in the file CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx identifies, for each commercial customer, the facility type, applicable design basis, typical flow assumptions, and resulting ERU multiplier used in the Phase 2 rate design.

In addition, Attachment 1-2 provides a reference table summarizing the design basis, typical flow values, ERU multipliers, and source documents by facility type, consistent with the methodology described in the Company's tariff and testimony.

b. All such values can be found in the "**Confidential** Commercial ERU Data" tab of the Phase 2 Excel spreadsheet.

1-3. **Source & Support and Explanation.** Refer to the following documents filed on separate dates with TPUC:

- Direct Testimony of Aaron Silas at 9:15,10:16 – 11:2, Exhibit "AJS-3: Proposed Phase 2 Rate Design" (March 2, 2026).

- Phase 1 Excel spreadsheet, File <CONFIDENTIAL Final Limestone Rate Design – 5.13 Proposed Redistribution.xlsx>, Tab "CONFIDENTIAL Commercial ERU Data," Column M (May 19, 2025).[2]
- For ease of comparing the spreadsheets filed by Limestone on May 19, 2026 (Tab "Comm Customer Bills," Columns G, K, L, M) and March 2, 2026 (Tab "CONFIDENTIAL Commercial ERU Data"), the Consumer Advocate created a table combining information from the two filings attached as CONFIDENTIAL Exhibit CA DR 1-3.

In Mr. Silas' testimony referenced above, he poses the following question:

> **Q:** CAN YOU PROVIDE AN EXAMPLE OF A CIRCUMSTANCE IN WHICH THE COMPANY HAS REVIEWED ERU ASSIGNMENTS AT THE REQUEST OF A COMMERCIAL CUSTOMER?

In his response to this Question, Mr. Silas raises the example of discussion with its commercial customer, Old Natchez Country Club. Mr. Silas' described the details of the exchange with this commercial customer as follows:

> Following Phase One implementation, Limestone Water engaged directly with Old Natchez Country Club to seek and evaluate more precise and reliable information regarding actual usage and guest volumes in order to consider a revision to the ERU assignment. Since the customer declined to provide internal attendance or sign-in data, Limestone Water utilized available water usage data as an alternative proxy to estimate average daily activity levels. Based on that information, Limestone Water updated the customer's ERU assignment and issued a refund for amounts previously billed. This cooperative, yet verified, approach ensures that commercial customers are ultimately billed based on the best available data while preserving the integrity of the approved rate design.

Provide responses to the following:

a. Provide the "available water usage data" used to update the customer's ERU assignment.
b. Explain how Limestone obtained the water usage data.
c. Explain why water usage data is an "alternative proxy" to estimate average daily activity levels.
d. Explain why water usage data is not a preferred method for estimating wastewater volumes when wastewater is not directly measured.

[2] *Id.*

e. Provide copies of all communication between Limestone representatives and representatives of Old Natchez Country Club.[3]
f. Provide copies of all communication between Limestone representatives and representatives of [redacted].
g. Explain why the values in Column K and Column L have not changed for this customer?
h. Are there other customers whose initial values have changed and are not reflected on this schedule?
i. Provide copies of all communication or contact that Limestone has had with customers inquiring about their rates or rate changes since the implementation of Phase 1.

RESPONSE:

a. The available water usage data used to evaluate Old Natchez Country Club's ERU assignment are attached to this response as " **CONFIDENTIAL** 1-3 Water Usage Info".

b. Limestone obtained the water usage data from a combination of information provided by the commercial customer and billing and usage records available through Harper Valley Utility District ("HVUD") customer service.

c. For this customer, the applicable ERU design basis is guest count. Because Old Natchez Country Club was unable or unwilling to provide daily guest check-in or attendance data—which would be the most accurate basis—Limestone used available water usage data as an alternative proxy to estimate average daily guest activity. In the absence of direct attendance information, water usage represented the best available data to inform the review.

d. Water usage data is not a preferred method for estimating wastewater volumes because ERU design bases vary by facility type. For example, some commercial entities are

[3] The Consumer Advocate did not redact the name of the Natchez Trace Country Club since it was referenced in the Consumer Advocate's Motion For Entry of a Procedural Schedule (February 4, 2026) and the Public Comment filed by Glynn Taylor about the increased commercial rates including the documents filed by the Consumer Advocate on behalf of Mr. Taylor (March 10, 2026).

assigned ERUs based on seats, alleys, or other non-usage measures. In those cases, water usage data would not reliably estimate the applicable design basis.

e. Please see the **CONFIDENTIAL** attached emails as well as the Company's response to subpart (i) for all available communication between 5.1.2025 and 3.2.2026.

f. Please see the **CONFIDENTIAL** attachment for all account logs between 5.1.2025 and 3.2.2026.

g. The values in Columns K and L did not change because those values were updated prior to the March 2, 2026 filing. Column K therefore reflects the most current information in the Company's billing system at the time of filing.

h. Any other changes to customer specific values reflected in the Phase 2 filing are captured in the **"Confidential Commercial ERU Data"** tab. The Company did round down when implementing the ERUs for the sake of flat values.

i. Limestone has produced the attached **CONFIDENTIAL** log of customer contacts responsive to this request. The attachment reflects customer service and billing system records identified by searching for inquiries relating to or containing the terms "rate inquiry," "rate increase," and "ERU." Entries unrelated to rate or ERU inquiries were excluded. The produced log reflects Limestone's records of customer contacts regarding rates or rate changes since implementation of Phase 1.

1-4. **Source & Support and Explanation.** Refer to the following documents filed on March 2, 2026, with TPUC:

- Direct Testimony of Aaron Silas at 12:5-9; Exhibits "AJS-3: Proposed Phase 2 Rate Design" and "AJS-3: Proposed Phase 2 Rate Design."

CA Exhibit CDK-6

[CONFIDENTIAL]

Excel Spreadsheet, File <CONFIDENTIAL CA Exhibit CDK-6 (Corrected CONFIDENTIAL DR1-3).xlsx>

CA Exhibit CDK-6

[CONFIDENTIAL]

Excel Spreadsheet, File <CONFIDENTIAL CA Exhibit CDK-6 (ERUs & Cust Compl).xlsx>.

CA Exhibit CDK-7

[PUBLIC]

LIMESTONE'S RESPONSES TO THE CONSUMER ADVOCATE'S FIRST SET OF DISCOVERY, CA DR1-1

RESPONSES TO FIRST SET OF DISCOVERY REQUESTS

1-1. **Source & Support and Rationale.** Refer to the following documents filed on March 2, 2026:

- Direct Testimony of Aaron Silas at 8:6-11, Exhibit "AJS-3: Proposed Phase 2 Rate Design."
- Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tabs "AJS 3 Rate Design Phase 2" and "Confidential Commercial ERU Data."

The referenced spreadsheet calculates the Company's proposed rates for Phase 2. Specifically, refer to Rows 41 to 43 of this spreadsheet which calculates the carrying cost surcharges of $1.24 for water customers and $1.67 for sewer customers. In the testimony of Mr. Silas, he states:[1]

a. As a result, the remaining unrecovered revenue deficiency during the pendency of Phase 1 was $640,292.28. Consistent with the Commission's directive, Limestone Water calculated carrying charges by applying deficiency, which results in carrying charges of $54,348.01
b. .Explain the Company's rationale for designing carrying cost surcharges that recover these costs in a single year.
c. Explain how this calculation is consistent with the method as set forth in the "Commission's directive" referred to in Mr. Silas' testimony.
d. Does Limestone intend to terminate the carrying charge at the end of one year? If not, when will the carrying charge terminate?

RESPONSE:

a. As reflected in Mr. Silas' testimony and Exhibit AJS3, the remaining unrecovered revenue deficiency during the pendency of Phase 1 was $640,292.28. Consistent with the Commission's directive, Limestone Water applied its Commission approved overall rate of return to the unrecovered deficiency, resulting in total carrying charges of $54,348.01.

[1] The Consumer Advocate notes that although the Phase 2 Excel spreadsheet is marked CONFIDENTIAL, the first 3 tabs of the spreadsheet are also attached to the PUBLIC Direct Testimony of Aaron Silas as exhibits. ("AJS 1 Monthly Revenue"; "AJS 2 Determinants Worksheet"; and "AJS-3: Proposed Phase 2 Rate Design").

b. Limestone Water designed the carrying cost surcharge to recover the approved carrying charges within a single year because the surcharge amounts are modest and recovering the carrying charges over a one year period ensures that the surcharge drops off customer bills in a timely manner once the approved carrying costs have been fully recovered. Under the proposed design, the monthly surcharge equates to approximately $1.24 for water customers and $1.67 for sewer customers.

c. The calculation is consistent with the Commission's directive because Limestone Water applied the Commission approved rate of return to the remaining unrecovered revenue deficiency for the period during which Phase 1 rates were in effect and recovery was deferred. The surcharge is a mechanical recovery of those carrying charges and does not modify any Commission approved methodology.

d. Yes. Limestone Water intends to terminate the carrying cost surcharge once the total approved carrying charges of $54,348.01 have been recovered. The surcharge is not intended to be permanent and will be removed from customer bills upon full recovery of the carrying charges.

1-2. **Source & Support.** Refer to the following documents filed on March 2, 2026:

- Direct Testimony of Aaron Silas at 8:17 – 9:2; Exhibit "AJS-3: Proposed Phase 2 Rate Design."
- Phase 2 Excel spreadsheet, File <CONFIDENTIAL Proposed Phase 2 Final Limestone Rate Design.xlsx>, Tabs "AJS 3 Rate Design Phase 2" and "Confidential Commercial ERU Data."

In the referenced testimony, Mr. Silas states:

> As stated in the tariff, "Equivalent Residential Units ("ERUs") have been assigned to each Commercial Customer utilizing typical wastewater flow rates derived from the Tennessee Department of Environment and Conservation 'Plans Review and Approval of