

Water Reuse Cost Allocations and Pricing Survey

TEC Project



**American Water Works
Association**

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Water Reuse Cost Allocations and Pricing Survey
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from American Water
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1. Background And Purpose

AWWA's policy statement on reclaimed water for public water supply purposes (updated June 2018) acknowledges the need for reliable and sustainable water supply resources and recognizes *"the value of high quality reclaimed wastewater—properly treated to appropriate standards—as a sustainable supplement to a region's water supply portfolio."* Reuse or reclaimed water (reuse is the naming convention selected for this project) is water that has been used for municipal or industrial purposes, captured, and treated for additional use. Reuse water has become an important source of water supply for many water utilities in many parts of the United States, including providing water supply for irrigation and industrial purposes; meeting the needs of cooling towers, flushing toilets, dust control, and fire protection; supplementing environmental conditions; as well as direct and indirect potable uses.

As reuse water is a relatively new source of supply, the water industry has not yet standardized on a single pricing approach. Furthermore, the measurement and allocation of costs of reuse water production is naturally complex, reflecting elements of both water and wastewater functions and requiring decisions regarding the correct treatment of shared costs. AWWA has for many years supported well-considered cost-based pricing through its policy statement on financing, accounting, and rates (updated June, 2015) which includes the recommendation that *"Rates should be designed to distribute the cost of service equitably among each type and class of service."* This policy statement supports the establishment of cost of service (COS) pricing practices, which serve in some ways as a benchmark for pricing in the water industry.

AWWA's M1, *Principles of Water Rates, Fees, and Charges*, provides the best articulation of cost-based pricing principles for the water industry and has become the water industry's most cited reference regarding cost allocations. The current seventh edition includes a new section on water reuse rates (Chapter V.1), which seeks to establish parameters and processes to guide utility managers in addressing cost allocations and pricing for reuse systems.

The challenge is significant because of the wide diversity of supply and technical situations facing utilities with reuse water, and because of the inherently multi-faceted nature of the expenditures and activities involved. Additionally, fundamental questions of purpose and policy are directly applicable to these questions, and sometimes must be addressed for the first time in a utility's history.

Stantec was engaged by AWWA to develop a survey, conduct interviews, and prepare this report to examine and report on patterns in the cost allocation and pricing for reuse water service in the United States. The objective is to illustrate practices and to draw out lessons and opportunities, as available, based on the practices of water utilities across the country. Individual utility efforts at cost allocation and pricing are varied and mostly disconnected. The purpose of this engagement was to capture a sample of approaches in the water industry and to synthesize the results to discern any visible trends and identify any transferrable lessons that can be shared across utilities. The provision of reuse water for a growing diversity of uses is expected to increase over time in response to increasing demands. Utility leaders may appropriately seek guidance in managing increased investment requirements and developing their own approach to calculating and documenting rate schedules.

Early in the history of pricing for potable water services, the approaches available to utility managers were limited by a lack of data and by institutional, social, and political limitations on pricing. It is now early in the history of pricing for reuse water, and the available approaches are bounded by the same mix of constraints. Yet the history of pricing for potable water services provides a map that could be encouraging to those addressing reuse pricing today. While data, institutional, social, and political limitations persist, and while key questions of policy and even philosophy must be addressed and are not easily resolved, utilities can and are managing cost allocations and pricing for reuse water effectively in many different ways.

The diversity of current approaches may offer a wide and useful perspective, and the lack of standardization may offer a needed breath of insight. It is the intent of this brief summary of survey results to support utility managers in their efforts to make sound and implementable decisions to enhance the strength of their utilities and the communities they serve.

This project was sponsored by AWWA's Technical and Educational Council (TEC), the water sector's technical voice providing knowledge, research, and solutions to effectively manage water through policy statements, publications, conferences, workshops, webinars, online courses, and research. Subject matter experts from around the world contribute to the technical leadership of AWWA through the work of eight Divisions responsible for advancing AWWA activities in engineering, operation and management, water quality, small systems, water sustainability, water resource management, and management of water utilities. The Management and Leadership Division (M&LD) is focused on the dissemination of knowledge to improve water utility management and leadership practices, and one of its component units, the Rates and Charges Committee, were the creators and involved supporters of this project; their help and sponsorship is gratefully acknowledged.



2. Utilities, Interviews, and the Questions

Utilities were selected to reflect a diversity of situations regarding water reuse systems including utilities:


- From different parts of the country;
- Of different sizes, serving different sized communities;
- With different drivers for investing in reuse systems;
- With different levels of maturity in their reuse programs; and
- With a variety of perspectives on cost recovery and pricing.

The participating utilities are:

- Albuquerque Bernalillo Water Utility Authority, New Mexico
- Aurora Water, Colorado
- Denver Water, Colorado
- Fort Worth, Texas
- Fulton County, Georgia
- JEA, Florida
- King County, Washington
- Long Beach, California
- Loudoun Water, Virginia
- Miami-Dade County Water & Sewer Department, Florida
- Moulton Niguel Water District, California
- Naples, Florida
- Orange Water and Sewer Authority, North Carolina
- Peoria, Arizona
- Plum Creek Water Reclamation Authority, Colorado
- San Antonio, Texas
- San Diego, California
- St. Petersburg, Florida
- Toho Water Authority, Florida

The project was initiated with a series of interviews so that we could get to the heart of the key factors driving each utility's approach to cost allocations and pricing. Extensive survey forms can more efficiently capture large quantities of standardized data, but a conversation is often necessary to develop an understanding of why an organization adopted the practices it is using.

The questions included framing questions on the nature of the system, as well as questions to provide context on the drivers behind creation of each participant's reuse system. The driving forces behind creation of a reuse system establish the foundation for all pricing decisions. We don't always think of the creation of a system in rate and cost allocation discussions, because water and wastewater utilities are so pervasive and fundamental to the modern world. But utilities are created in response to a need, and that need tends to define the organizational, physical, and financial solutions that will



be employed. A reuse system can be created in response to regulatory requirements, the peak irrigation needs of a prosperous residential area, or as a tool to meet fundamental water supply needs. The pricing environment could be markedly different between cases such as these.

The interviews were structured to build the conversation toward an ultimate focus on the cost allocation and pricing decisions underpinning the existing rate structure. As possible, we encouraged interviewees to describe the extent of the system, the size of the system relative to other water utility functions, and the relationships between reuse classes and other customer classes, among other topics, to provide background and perspective.

The questions were divided into three sections:

- Section 1: Reuse Water Utility Characterization
- Section 2: Key Reuse and Reuse Rate Drivers
- Section 3: Detailed Reuse Water Rate Structure Characterization

The first section was the most concrete but was primarily structured to support the other two sections – information about each system’s size, location, and customer classes is primarily seen as providing context for the fundamental questions in later sections.

Section two addressed drivers for creation of the utility’s reuse system and reuse rate structure, as well as additional information on the way the reuse system interacts with and affects water and wastewater utility functions. This included a question on the pricing discussions each utility may have had, and whether or not factors such as establishing a market, achieving “full cost recovery,” or pricing to reflect the costs of alternative water supply were considered. It also included a chance for respondents to address public perceptions regarding reuse water quality, pricing, and other costs of using this source of water.

The third section focused on the structure of reuse rates. Rate structures are the ultimate embodiment of all of a utility’s cost causation and allocation analyses, as well as its service and management policies and practices. It is through the rate structure that utilities communicate the scarcity or abundance of water resources and the implications of different types of consumption behavior. A well-developed rate schedule prevents users from having to understand water supply constraints, drought exigencies, or the cost burdens of serving customers with high peaking ratios. Instead, customers can react to a price signal that distills all of this information and make sound consumption decisions accordingly. Estimating consumers’ price responsiveness, (the “own-price elasticity” of the demand for water), is challenging and imprecise, but widely recognized (see AWWA M1, chapter V.7, and *Principles of Public Utility Rates*, Bonbright et.al, 1988). This section allowed the survey to capture any information offered regarding pricing to different customer classes, differences by season or zone, and other fees and charges related to reuse. This final section concluded with explicit questions regarding the basis for reuse rates, the constraints in implementing reuse rates, and the adequacy of reuse rates.

3. Survey Questions

Section 1: Reuse Water Utility Characterization

- 1.01 Name and title of utility professional being interviewed
- 1.02 Name and address of agency
- 1.03 Location served
- 1.04 Organization and superior or subordinate units
- 1.05 Please describe the utility services that your agency provides
- 1.06 What is the nature of your reuse service?
- 1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area?
- 1.08 Generally describe the end users of your reuse water—large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.
- 1.09 Please describe the customer classes served by your reuse water utility
- 1.10 Please provide data on the count of your customers by class
- 1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class
- 1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area
- 1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?
- 1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?
- 1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?
- 1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?
- 1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.
- 1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?
- 1.19 Are customers required to connect to your reuse facilities when service is available?

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market—getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Section 3: Detailed Reuse Water Rate Structure Characterization

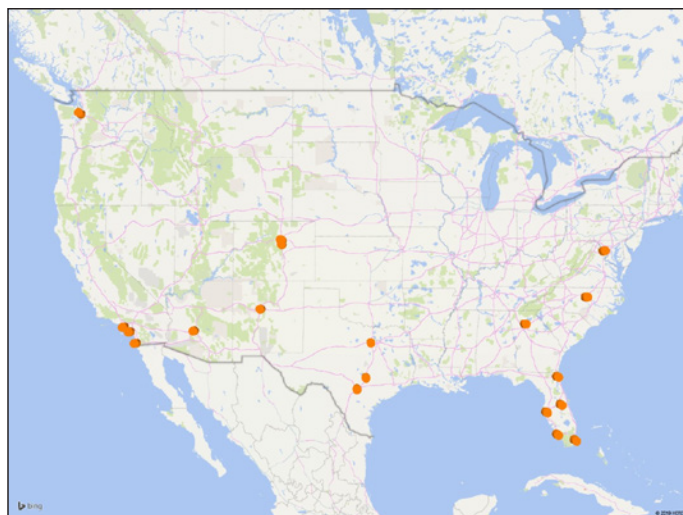
- 3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?
- 3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?
- 3.03 Is reuse water consumption metered?
- 3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?
- 3.05 Does your rate structure have a take or pay provision for any customers?
- 3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?
- 3.07 Do you currently use seasonal rates?
- 3.08 Do you currently have different rates for customers in different locations or zones?
- 3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?
- 3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.
- 3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?
- 3.12 How did you allocate costs between water/sewer/and reuse water services?
- 3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?
- 3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you “just know”, or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?

4. Selected Survey Results

Interviews were conducted with 19 utilities during the winter of 2018/2019. The figure below identifies the location of each. The utilities are reflective of the areas in the US with the most investment in water reuse infrastructure, principally Florida, California, and the Southwest.

The mix of utilities is deliberately diverse, and the extent of variation in some key characteristics is striking:

- Organization:
 - Cities, counties, authorities
- Age of the reuse utility:
 - One formed as early as 1968
 - One in the process of creation
- Customers:
 - Retail and wholesale
- Primary uses:
 - Irrigation—institutional, commercial, and residential
 - Industrial, institutional, and data center cooling
 - Environmental restoration
 - Salt water intrusion
- Extent of service
 - As much as the vast majority of all irrigation needs in the community
 - As small as a handful of customers in a small part of the overall service area
- Annual revenue generation:
 - As much as \$7 million, as low as \$250,000
- Original and ongoing funding for infrastructure
 - Existing fund balances from other utility operations
 - Contributions from a single major customer
 - Reuse rates and impact fees
- Basis for cost allocations
 - Cost of service principles
 - Known incremental investment
 - Identification of incremental operating costs
- Basis for rate structure
 - Cost of service principles
 - Linkage to potable water rates
 - Honoring early contracts
 - Pricing to maintain or grow the market for reuse water
 - Pricing to reflect the true costs of production of potable and reuse water in total



The most fundamental characteristic of reuse systems is the purpose to which reuse water is being applied. Irrigation is the dominant use for most utilities, with a full compliment of irrigation types including:

- Institutional green spaces (parks, highway medians, etc.)
- Institutional locations (schools, universities, etc.)
- Golf courses, private and public
- Home owners' associations
- Retail residential irrigation
- Wholesale sales to other entities for irrigation needs

Table 1 summarizes the primary uses identified by each utility.

Table 1: Primary Uses of Reuse Water

Utility	Primary Uses
Albuquerque Bernalillo Water Utility Authority	Landscaping, industrial (cooling)
Aurora Water	Irrigation only, investigating industrial customer use opportunities
Denver Water	85% for irrigation, cooling at one museum
Fort Worth	Irrigation (golf course), cooling tower (airport)
Fulton County	Irrigation at golf courses and city parks
JEA	Residential and commercial irrigation
King County	Irrigation primarily, as well as environmental (restoration of habitat)
Long Beach	Irrigation, industrial, and seawater barrier injection
Loudoun Water	Data centers (99%), commercial irrigation
Miami-Dade County Water & Sewer Department	Process water at wastewater treatment facilities, part of ocean outfall reversal requirements
Moulton Niguel Water District	Irrigation
Naples	Irrigation, fire protection
Orange Water and Sewer Authority	Cooling (University of North Carolina), and irrigation at a major church facility on route
Peoria	Irrigation
Plum Creek Water Reclamation Authority	Golf course irrigation
San Antonio	Irrigation, cooling towers, industrial uses, and environmental flows
San Diego	Residential and commercial irrigation, cooling towers, dust control
St. Petersburg	Irrigation
Toho Water Authority	Irrigation, fire protection, cooling at power plant

Figure 1 illustrates the most frequently mentioned primary uses reported by participants. Irrigation is the dominant use, but there is significant diversity within that category. Irrigation by small retail customers through an extensive reuse distribution system is very different from focused irrigation at large facilities such as parks and golf courses. Diversity within each of the identified additional uses for reuse water is extensive as well, and all of this diversity is relevant

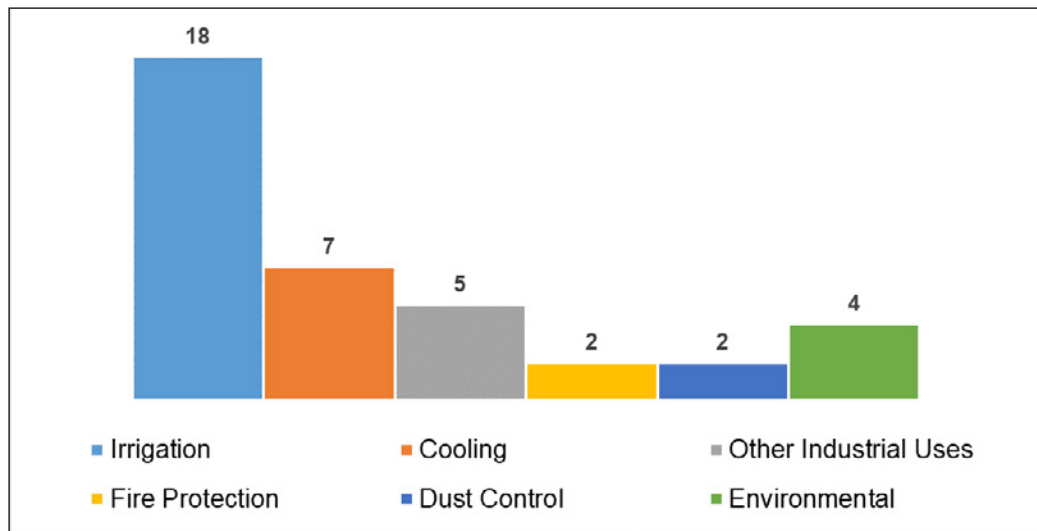


Figure 1: Primary Reuse Water Functions for Participating Utilities

to system management and pricing practices. Utilities provide service to customers with specific needs, and these needs represent widely differing economic drivers behind varied reuse demands. As examples, cooling uses differ rather significantly from irrigation uses, and institutional cooling needs may differ significantly from cooling needs for data centers. The application of reuse water to environmental restoration and management initiatives may require different economic evaluations than fire protection, uses required by regulation, or dust control. Because each utility may be facing a unique mix of uses and drivers, it may be that the water industry is encountering something new in our attempts to systematize cost allocation and pricing practices for reuse water.

The drivers for creation of reuse utilities may be more simply summarized than use characteristics. In most cases, initial investment in reuse treatment and transmission assets was driven by:

- a direct utility focus on water supplies,
- a utility’s challenges related to effluent disposal requirements or objectives, or
- regulatory drivers related to water supply, irrigation with potable water, or effluent disposal.

The specifics are varied, but augmentation of water supply, whether driven by utility or regulatory interests, or a focus on effluent discharge conditions and nutrient limits (largely driven by regulatory processes), are behind the establishment of most programs. The current characterization of a program may focus primarily on irrigation uses or on higher level objectives such as sustainability or water stewardship, but at least one of these fundamental drivers appears to be present in every case.

The identification of key common drivers for utility establishment does not imply uniformity or simplicity of approaches to cost allocation and pricing. Utilities similarly driven by critical needs to augment water supplies are not likely to face identical organizational structures, cost profiles, investment requirements, or cost of service or rate study practices, let alone the same customer needs and demand profiles.

Table 2 summarizes the pricing information we received from each utility regarding their high-level pricing objectives and practices.

Table 2: Utility Pricing

Utility	General Pricing Practices
Albuquerque Bernalillo Water Utility Authority	Reuse study completed in 1999. Cost of service is based on potable water, reuse rates are set at 80% of potable rates. Intends to fully recover capital costs.
Aurora Water	Customers requested rate relief. Cost of service based rates, but subsidized by water rates.
Denver Water	Subsidized by potable water. Internal discussions to understand what the subsidy is, but step up from giving it away free. Charging more would turn customers away.
Fort Worth	Reuse is budgeted as a stand-alone function, but market constraints prevent setting reuse rates higher than potable rates; the wastewater budget bears any cost burden above the level of reuse revenues
Fulton County	Transitioning to cost-based pricing; system and customers inherited from private operator, a gradual process to refine pricing to reflect incremental production costs is almost complete.
JEA	JEA approaches pricing from a policy perspective first and focuses on the goals and objectives of all key policies. Cost of service principles, conservation imperatives, and maintaining good stewardship over water resources are primary drivers. One water = rates are equal to potable water rates.
King County	Combination of cost of service-based rates and market pricing. Rates are benchmarked off the regional wholesale potable water rates, and set as a percentage of that. Rates vary across customers (each is set an individual rate depending on unique customer situation).
Long Beach	Cost of service.
Loudoun Water	Cost of service, recover incremental cost of service of reuse. Revenues collected cover reclaimed water operations and maintenance costs. Capital cost recovery for system infrastructure is funded by dedicating availability charges associated with each ERC added to the system. The rates are likely under-recovering the true full cost of providing the service because they are based on the incremental costs.
Miami-Dade County Water & Sewer Department	Not started, no pricing yet.
Moulton Niguel Water District	Cost of service designed on marginal cost, water budget based rates for the recycled customers. Rates set at about 70% of potable water rates.
Naples	Cost of service study, however pricing was set based on combination of what the market could bear and cost of service results. Not full cost of service, some subsidy from water/sewer rates.
Orange Water and Sewer Authority	Only 2 customers served, system built to serve one, the other was on route. Cost of service was the basis for the rates, rates are adequate.
Peoria	Rates are set based on cost recovery of production and delivery, does not include distributing costs. Not full cost of service, some subsidy from water/sewer rates.
Plum Creek Water Reclamation Authority	Cost of service rates, focus on identifying specific costs for sewer and reuse, and allocate those to determine the rates.
San Antonio	Cost of service, half the cost of commercial potable water. There are two rates, an "exchange" rate and "non-exchange rate", the exchange rate is a customer who traded over permitted ground water which is in SAWS inventory. The "exchange rate" is much lower than the "non-exchange" rate.
San Diego	Cost of service.
St. Petersburg	Not metered, cost of service but each water/sewer subsidize 50% of cost shortfall.
Toho Water Authority	Cost of service, 91% cost recovery. Reflects a concerted effort to raise the reclaimed from 82% of allocated costs.

Figure 2 illustrates the frequency with which the participants mentioned the most common pricing considerations.

While at least 75% of the participants identified cost of service as one of the drivers of pricing practices for their reuse rates, of those, over half also commented that their rates do not meet the full cost of service recovery goals identified in their rate studies. We believe this

apparent incongruity reflects several factors, the first being unique to reuse, with the remainder being more similar to water and wastewater pricing considerations:

- Cost allocation practices for reuse systems are new within the industry;
- Reuse system assets, configurations, technologies, and operational considerations are tremendously varied;
- There is a diversity of understanding and application of cost of service principles generally;
- Once a reuse system is built and implemented, there is an opportunity for managers to refine and extend their understanding of cost drivers and their interactions, leading to gradual refinement of cost structures and pricing;
- State requirements or other policy drivers compelling cost of service pricing in name, while the economic realities of the demand for reuse water are not subject to legislative or policy direction;
- Recognition that the gradual process of building a utility leads to a gradual process to establish pricing patterns to reflect system costs; and
- Recognition that the fundamental advantages of cost-based pricing must be integrated with pricing practices oriented toward achieving other policy objectives.

The most noteworthy factors in this context may be the first two – managers should recognize that the process of determining proper cost allocation processes for reuse water is substantially less well developed and more variable than corresponding processes for water and wastewater services. Embracing cost of service processes is common, and positively contributes to effective management for most utilities, but we should not overstate the uniformity that this practice implies. Differing technical, water supply, wastewater effluent, organizational, demand, and community conditions have direct and relevant implications for cost allocations. The proper recognition of wastewater investment and operating costs is not the same for each utility; the degree to which avoided costs of incremental water supply should be recognized differs widely. All meaningful cost of service processes recognize the unique conditions facing a utility – cost of service considerations for reuse water appear to be an extreme case in which the particulars of local situations may often overwhelm the common elements.

An example of the difference between pricing and cost allocation for reuse systems as contrasted with those for potable water or wastewater systems is the importance of proximity to distribution or collection systems. Potable water distribution and

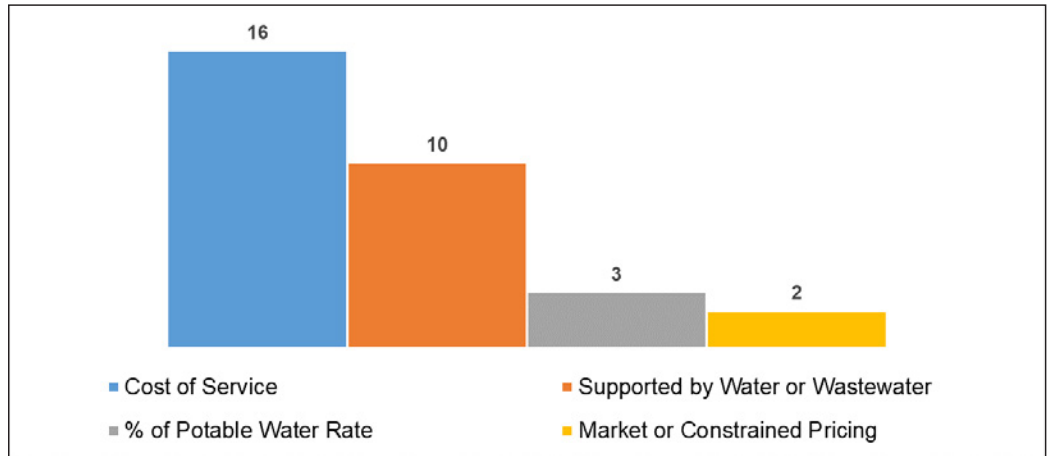


Figure 2: General Pricing Considerations for Participating Utilities

wastewater collection systems represent significant investments, and every utility has encountered the sometimes extremely challenging task of extending service to new service areas in a cost-effective way. Unit costs of service for lower density and more distant points of connection can be dramatically higher than for “in-town” or other nearby customers.

Yet proximity in existing systems is often deemed to be irrelevant in cost of service studies for existing utilities, so the fundamental cost drivers of distance and density are not typically used for potable water or wastewater cost allocations. From system management and policy perspectives, this approach is rational and broadly beneficial¹; while proximity may be the largest single factor in the determination of cost effectiveness for providing service to new customers, an existing customer base is often well served by a common average-day or peak-ratio based allocation of collection and distribution costs.


Entirely new utility systems, as is often the case for reuse, are very different and quite challenging in this regard. Distance insensitive pricing for reuse systems could easily lead to significant and unsustainable subsidization of remote users at the expense of those nearby. Yet a full cost allocation of distribution system costs to new reuse system customers frequently makes reuse water a noneconomic choice. This hurdle is significant as it may tend in some cases to keep utilities from achieving higher degrees of economies of scale, thereby having the potential to threaten the long-term viability of new reuse systems.

Additional observations:

- Many utilities reference a pricing constraint related to rates for potable water, which is perceived to establish an upper limit for pricing of reuse water. This very important and common constraint has significant implications for both pricing and management and may be at the heart of the visible conflict between cost-based pricing and market constrained pricing described above.
- Some utilities see full cost recovery for reuse water as an important objective, while others are focused more on expansion of their programs, covering specifically identified costs (such as operating costs), and overall revenue sufficiency. The difference in prioritization is significant, and over time could easily make the difference between expanding and static systems².
- JEA was the only utility surveyed where the reuse rates are set to be equal to potable water rates, as JEA subscribes to a “one water” concept with a focus on long term resource management. This practice would be consistent with the cost allocation pattern required to support implementation of direct potable reuse programs and may be of use to utilities considering this route.
- Most of the utilities meter reuse water usage, and employ either a combination of fixed and variable rates, or only a variable rate for their customers. However, the common pattern should not obscure the need of several utilities to accomplish their resource management or effluent disposal objectives by offering unmetered reuse water, by establishing take or pay requirements, or by establishing large volumes to be included in base charges or minimum bills.

¹ Differences in costs resulting from distance from key facilities are generally omitted from cost of service analyses to avoid following a path with the potential to create burdensome levels of differentiation within a rate schedule. The result is an approach that focuses on providing the same level of service within a service area, differentiated primarily by use patterns such as volumetric consumption and peak usage considerations.

² This is not intended to suggest that an expanding reuse system is necessarily superior to a static system over the long term. Many utilities embrace system expansion as a primary reuse system objective, but smaller systems serving more limited geographies can be sustainable. Utilities considering direct potable reuse over the long term may be especially well suited to this approach – duplicative distribution systems would seem to offer very little benefit in such cases.

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- At least half of the utilities identified that their current water and/or sewer rates subsidize their reuse rates. In many additional cases, it is likely also true that cost allocation processes may have been focused to help create alignment between likely potential revenue generation and the costs assigned to reuse water.
 - Some of the utilities focus on retail services and others are more focused on wholesale or other bulk usage customers.
 - Some have adopted a single rate schedule for all reuse usage, some have adopted customer class-based rates, and others have developed unique rates for each customer depending on their location within the system or usage profile, generally codified through service contracts.

Utilities face such different circumstances in the production and distribution of reuse water, thus it is not surprising that their ability to recover the costs of service also varies widely. Unlike the longer-standing utility functions providing potable water and wastewater services, reuse water is a relatively new service in many areas, and especially in these cases, cost recovery is mixed. It should also be acknowledged that the question of revenue adequacy is a function of a utility's perceptions regarding the costs of reuse water production and distribution – a utility with an objective of recovering a fully allocated, fully burdened revenue requirement for reuse water might report a very different result than that from a utility seeking to recover costs developed with more of an incremental approach.

All of the utilities surveyed except one indicated that they had received positive public comments, with the public generally seeing provision of reuse water as a benefit to the community and environment or just as a positive because it provides an additional source of water.

5. Lessons Learned


With the hindsight only possible at the end of a project, the value of this investigation will derive more from sharing the reasonable real-world strategies being employed than in creating or contributing to a step-by-step guide for reuse cost allocation and pricing. In fact, our primary conclusion runs counter to the very idea of a “one size fits all” approach. Specifically, we conclude that a fully informed approach to reuse pricing must focus on utility-specific policies and objectives, not on specific allocation processes, and be fully responsive to the unique conditions facing each reuse utility. It is not that cost of service principles do not apply, or that revenue adequacy, financial stability, or any other fundamental principle of utility management is irrelevant, it is rather that successful reuse programs are especially sensitive to local conditions, and that these conditions require the use of very different cost allocation and pricing strategies from locale to locale. Forward-looking water utilities must manage their sources of water supply sustainably over the very long term. Pricing practices must reflect the paramount importance of this objective and contribute to the development of needed reuse water infrastructure and markets, not retard it.

A common thread and fundamental challenge is the necessity of acknowledging the constraint created by current pricing patterns for potable water. Practitioners applying standard cost allocation practices may often find themselves identifying reuse water costs substantially in excess of potable water rates, even in many cases where the focus is limited to incremental cost approaches. If cost-based pricing would lead to rates that no customer would choose to pay, a broader management and policy approach may be required.

The perception of reuse water as an “inferior product” is something that the water industry can address over time, especially as related to specifically identified uses. But such perceptions are real and are sure to persist for some time, so most systems see potable rates as an upper boundary that reuse rates cannot pierce or even approach in many cases. Given this reality, a preoccupation with traditional cost allocation and pricing strategies could be misplaced. Knowing the relevant pricing constraints, a more fruitful approach may be first to determine the most effective level and profile for effective system operations, then to develop pricing to support that goal. That is, as effective operators have always done, to set a goal and work toward achieving that goal consistently and over the long term.

For reuse water, the goal may be establishing and operating a system of a size and configuration that works for each utility, and establishing pricing practices consistent with that goal. For rate analysts, the key lesson may be to embrace the inherent complexity and individuality of reuse pricing situations, and to resist the urge to overly systematize and standardize. Embracing standardized systematic processes can be powerful in managing the large customer classes commonly found for potable water and wastewater systems, but would appear to have the potential to be unnecessarily restrictive in reuse pricing. Examples of potentially excessive approaches might be to insist on assigning a proportionate share of wastewater treatment costs to reuse volumes, or to overly rely on peak demand ratios, either of which might follow basic principles of cost causation but fail to recognize the long-term functionality, cost effectiveness, and equity in cost recovery attainable through establishment of a broadly based reuse water system.


None of this is to suggest that cost-based reuse pricing approaches do not offer substantial value where they are implementable, or that fully allocated costs wouldn't represent an appropriate basis for rate-setting for some reuse utilities. Utilities able to



conduct integrated cost of service analyses and implement rates and rate structures consistent with those results are generally to be applauded and often to be envied. The point is that traditional cost allocation approaches could have the potential to result in unachievable pricing targets in some cases, and that over the very long term, these targets might be too high from equity and resource allocation perspectives.

Successful reuse water systems are able to meet water supply management, wastewater discharge, environmental, or policy objectives in a cost-effective and financially sustainable manner. There is no optimal size or scope; widespread multi-jurisdictional retail irrigation distribution systems are appropriate in some cases, but small numbers of very local large users may constitute an appropriate size and configuration in others. The emerging stories of successful reuse water systems focus on the unique – the urgent drivers, the differing cost situations, the geographies, the demands, the needs, and the opportunities. Some of the unique management and pricing strategies and approaches being used include:

- Avoiding a primary focus on allocating significant portions of organizational and wastewater treatment costs to reuse water. Analysts' initial reactions to reuse cost allocations seem sometimes to start with parsing out overhead and wastewater treatment costs and then to add the fully burdened costs of incremental treatment, distribution, and management. Effective reuse pricing seems more often associated with less comprehensive cost recovery targets, often focusing on incremental treatment and distribution as the primary cost recovery targets, and allowing the more broadly based water and wastewater functions to carry portions of the costs of program development and to fully bear ongoing costs of management and administration.
- Similarly, classic water cost allocation approaches such as the Base-Extra capacity method also would seem to offer little benefit to most reuse systems. Irrigation, cooling, and other special demand profiles would tend to drive cost allocation results that might not be economically viable for consumers. The real-world question for managers is whether it would be better to price reuse water at some theoretically justified level and sell very little water, or whether a market-constrained reuse pricing strategy would allow the utility to achieve water resource management and other objectives, improving long-term viability and sustainability of the utility to the benefit of all customers. Each of the participating utilities has made the second choice to the benefit of the communities they serve.
- One very interesting strategy to provide additional pricing flexibility and to support effective management of water resources is being used by the San Antonio Water System (SAWS), which creates a lower rate for reuse water for customers who give up their groundwater withdrawal permits to SAWS. This action of "exchanging" water rights, allows them to contribute to the utility's ability to manage water resources in return for a reduced reuse water rate.
- Recognizing and accepting the importance of proximity to the treatment plant or existing distribution system in determining cost-effectiveness. Potentially significant users may be desirable in the abstract, but prudent management suggests a primary focus on economically viable service opportunities.
- Embracing a wider variety of potential uses than might at first seem possible. Recognizing the fundamental constraints of cost-effectiveness and proximity, utilities could seek to identify nearby nonirrigation uses with the potential to increase customer diversity and increase off-season volumetric sales.

- 
- Considering nonirrigation uses as a potentially primary target market for reuse water. Loudoun Water’s focus on data centers and OWASA’s focus on a university each have created beneficial long-standing relationships and stable demands for reuse water.
 - A willingness to focus on a few large users, unlike potable water and wastewater treatment services, can benefit the community from targeted availability of reuse water. Implementation of a reuse system with a handful of large users can make a material dent in the use of potable water for irrigation and other uses, potentially freeing up existing supplies for beneficial use. The cost allocation and pricing practices appropriate to management of a small number of very large customers with unique service characteristics is very different from practices necessary to support a large and relatively homogeneous customer base.
 - Use of relatively large minimum bill amounts, especially in regions where active consumption during the “off season” is important to optimize management of the reuse system.
 - Focusing on the very long term, where reuse water is fully integrated with current potable supplies as JEA is doing. The “one water” approach leads to cost allocations that will be consistent and sustainable if a utility were one day to implement indirect potable reuse or direct potable reuse. This may be the most compelling and forward-looking snapshot to emerge from the entire study – potentially paving the way toward a full integration of water supplies into a carefully managed, effectively priced, sustainable whole.

6. Appendix

The following pages contain the survey forms for the participating utilities. These forms attempt to capture key results and observations, and in addition to the experiences of our interviewers, they provided the primary basis upon which conclusions are drawn.

While every effort has been made to characterize our conversations accurately, these forms are not represented as official statements of any utility or utility employee, and only reflect our best understanding of each utility's situation at the time of our conversation.

The management and leadership of each utility is contributing to the strength of the water industry by participating in research and survey initiatives such as this. Their ongoing support is fundamental to the continued advancement of the water industry, and their support of this research effort is gratefully acknowledged.

Albuquerque Bernalillo Water Utility Authority, New Mexico

Aurora Water, Colorado

Denver Water, Colorado

Fort Worth, Texas

Fulton County, Georgia

JEA, Florida

King County, Washington

Long Beach, California

Loudoun Water, Virginia

Miami Dade, Florida

Moulton Niguel Water District, California

Naples, Florida

Orange Water and Sewer Authority, North Carolina

Peoria, Arizona

Plum Creek Water Reclamation Authority, Colorado

San Antonio, Texas

San Diego, California

St. Petersburg, Florida

Toho Water Authority, Florida

Albuquerque Bernalillo Water Utility Authority, NM

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Stan Allred, CFO; Adrienne Candelaria, Customer Service Manager																																																								
1.02 Name and address of agency	Albuquerque Bernalillo County Water Utility Authority																																																								
1.03 Location served	City of Albuquerque and Bernalillo County																																																								
1.04 Organization and superior or subordinate units	Stand-alone authority, separate from the City																																																								
1.05 Please describe the utility services that your agency provides	Water, wastewater, reuse																																																								
1.06 What is the nature of your reuse service	Non-potable water																																																								
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	2007/2008 San Juan Drinking Water Project - historically aquifer pumping; purchasing surface water rights stored in reservoir; WTP; Rio Grande R transport - pulls water out (55MGD) - stopped need to pump from aquifer. PS off river - Northside Reuse - water pumped across northern part of service area (ABQ) to irrigate parks, landscaping. Ordinance states if customer is located within a certain distance of reuse system (60 ft), must connect.																																																								
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Southside Reuse - polishing water from WWTP on south - transport to south area of ABQ - irrigates southern area of parks, etc. Same rate, same ordinance language. Water 2120 - water conservation policy for next 100 yrs.; service area can increase by 90K and water supply will be sufficient without buying further water rights (ground & surface); includes reuse projects over next 100 yrs.; 4 acres on west side of ABQ for satellite WWTP; solids removal to south; polished water to west side of ABQ (currently cannot provide reuse water to parks on west side); developer with land - put in infrastructure at no net cost to Authority; much of infrastructure will be reuse (facilities, polished water, can also be used as drinking water).																																																								
1.09 Please describe the customer classes served by your reuse water utility	Residential, multi-family, commercial, institutional (parks, schools)																																																								
1.10 Please provide data on the count of your customers by class	Institutional (schools, parks) and industrial (cooling) primarily; some commercial (ABQ Journal- paper, lots of landscaping); not many residential right now but will be more in the future as developer will be required to have reuse infrastructure																																																								
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	<table border="1"> <thead> <tr> <th>Potable Water</th> <th>2018</th> <th>2017</th> <th>2016</th> </tr> </thead> <tbody> <tr> <td>Residential</td> <td>19,884,384</td> <td>19,655,834</td> <td>19,112,151</td> </tr> <tr> <td>Commercial</td> <td>5,832,891</td> <td>6,109,328</td> <td>6,152,077</td> </tr> <tr> <td>Industrial</td> <td>521,416</td> <td>288,688</td> <td>230,119</td> </tr> <tr> <td>Institutional</td> <td>5,334,950</td> <td>5,042,838</td> <td>4,768,525</td> </tr> <tr> <td>Multi family</td> <td>6,407,360</td> <td>6,260,206</td> <td>5,848,400</td> </tr> <tr> <td>Other</td> <td>264,016</td> <td>467,108</td> <td>413,399</td> </tr> <tr> <td>Total</td> <td>38,245,017</td> <td>37,824,002</td> <td>36,524,671</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Reuse Usage</th> <th>2018</th> <th>2017</th> <th>2016</th> </tr> </thead> <tbody> <tr> <td>Commercial</td> <td>260,214</td> <td>353,050</td> <td>327,032</td> </tr> <tr> <td>Institutional</td> <td>990,963</td> <td>956,898</td> <td>889,493</td> </tr> <tr> <td>Industrial</td> <td>-</td> <td>2,105</td> <td>-</td> </tr> <tr> <td>Other</td> <td>105</td> <td>324</td> <td>-</td> </tr> <tr> <td>Total</td> <td>1,251,282</td> <td>1,312,377</td> <td>1,216,525</td> </tr> </tbody> </table>	Potable Water	2018	2017	2016	Residential	19,884,384	19,655,834	19,112,151	Commercial	5,832,891	6,109,328	6,152,077	Industrial	521,416	288,688	230,119	Institutional	5,334,950	5,042,838	4,768,525	Multi family	6,407,360	6,260,206	5,848,400	Other	264,016	467,108	413,399	Total	38,245,017	37,824,002	36,524,671	Reuse Usage	2018	2017	2016	Commercial	260,214	353,050	327,032	Institutional	990,963	956,898	889,493	Industrial	-	2,105	-	Other	105	324	-	Total	1,251,282	1,312,377	1,216,525
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1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	Cooling processes at industries																																																								
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	See 1.08 - more residential in the next 40 yrs.; nothing expected in the next 10 yrs.																																																								
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	Only reg is ordinance requirement of proximity to reuse water line and connection requirement - irrigation only																																																								
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	See 1.07-1.08																																																								
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Unknown																																																								
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	Miles of raw water pipe: 6. Miles of finished water pipe: 3,332. Potable water storage facilities (in MG): 245. Water treatment plants (in MGD): 96. Annual reclaimed water (in MG): 1,170 Raw Water Reservoirs: 1 Potable water storage tanks in the distribution system: 61 Clearwells: 2 Water treatment plants: 1																																																								
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Authority built existing lines & facilities; in the future - developers build; Authority will own; developers turn over assets, Authority collects WRC & UECs, reimburses developer; if developer builds infrastructure costs into home, Authority does not need to reimburse; west side WWTP - Authority will likely build facilities and use UECs for payment (inside service area)																																																								
1.19 Are customers required to connect to your reuse facilities when service is available?	Customers that are currently using potable water for irrigation or other qualified industrial purposes as determined by the Water Authority and whose property is located within 200-feet of a non-potable water line are required to connect to the non-potable system within one year of service availability. Connection to non-potable system is a condition of service.																																																								

Albuquerque Bernalillo Water Utility Authority, NM

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>Part of Water Resource Management Strategy, developed/realigned every 10 yrs.; now called Water 2120 (will be evaluated in 10 years)</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>Water side technically (water SCADA monitored), organizationally, and customer viewpoint; SJC project - separate rate in structure to generate revenue for reuse projects (currently part of water rate)</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>Customer education for last 20 years; embedded in culture; plan for source of potable water and Authority is educating customers now</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>SJC revenues initially; Water Resources Charge (currently water supply charge) plus UECs for water and wastewater; avoid burden on existing rate payers</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p>Impacts irrigation use but not significantly; had an impact initially (reduced potable water needs - 155 gpcd initially, currently at 126 and dropping); goal 115 gpcd; partially due to reuse as well as conservation behavior; landscaping allowances; energy efficient homes (county and City ordinances)</p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>N/A; last rate study adjusted revenue recovered from base rates to increase revenue stability (48% fixed charges, 52% commodity rates)</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>Pricing at 80% of potable water rates</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> • Establishing a market -- getting/retaining reuse customers • Keeping reuse investment from burdening other customers • Recovering the full capital and/or operating cost of reuse • Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure • Reflecting the benefits derived from the reuse program • Other (specify) _____ 	<p>Reuse rate study was completed in 1999</p> <p>Yes No No Yes No Comparison survey</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> • Overcoming retrofit costs borne by NPR customers • Overcoming perceptions of lesser quality for reuse water • Pressure to price reuse water below the price of potable water • Cost recovery: recovering the full capital and operating costs of providing reuse water • Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools • Other (specify) _____ 	<p>Water 2120 - how to pay for infrastructure</p> <p>All one water source Unsure Capital costs will be recovered</p>

Albuquerque Bernalillo Water Utility Authority, NM

Section 3: Detailed Reuse Water Rate Structure Characterization

- 3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?
- 3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?
- 3.03 Is reuse water consumption metered?
- 3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?
- 3.05 Does your rate structure have a take or pay provision for any customers?
- 3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?
- 3.07 Do you currently use seasonal rates?
- 3.08 Do you currently have different rates for customers in different locations or zones?
- 3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?
- 3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.
- 3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?
- 3.12 How did you allocate costs between water/sewer/and reuse water services?
- 3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?
- 3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?

No																
Base fixed monthly charges by meter size																
Yes																
Yes, uniform rate per unit based on: irrigation only - water resources group looks at usage, irrigation allowance based on sq. ft, assigns surcharges if usage above baseline; calculated approximately in April; likely all parks and golf courses get surcharged																
No																
No; same rate structure for all customers																
Yes; looks at irrigation season to determine if surcharge should be charged																
No																
Yes - utility expansion charges (UECs); water resources charge will be assessed to new customers outside current service area																
<table border="1"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Revenue Fixed</td> <td>461,973</td> <td>545,440</td> <td>517,602</td> </tr> <tr> <td>Revenue Commodity</td> <td>2,006,537</td> <td>2,297,783</td> <td>2,207,775</td> </tr> <tr> <td>Total</td> <td>2,468,510</td> <td>2,843,223</td> <td>2,725,377</td> </tr> </tbody> </table>		2016	2017	2018	Revenue Fixed	461,973	545,440	517,602	Revenue Commodity	2,006,537	2,297,783	2,207,775	Total	2,468,510	2,843,223	2,725,377
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COS is basis of potable water rates; reuse rates set at 80%																
COS study - line items are allocated on established cost allocation process																
See 3.11																
Reuse study was complete in 1999; WRMS was re-done in Water 2021; reuse has been a part of Authority's strategy and system for years; recovered all reuse costs at this point; borrowed \$\$ will be repaid in 2022; debt service being collected thru water and wastewater rates; current system has been covered; current reuse rate recovers treatment costs; will be reimbursed for future reuse capital costs																

Aurora Water, CO

Section 1: Reuse Water Utility Characterization

- 1.01 Name and title of utility professional being interviewed
- 1.02 Name and address of agency
- 1.03 Location served
- 1.04 Organization and superior or subordinate units
- 1.05 Please describe the utility services that your agency provides

- 1.06 What is the nature of your reuse service

- 1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.
- 1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.

- 1.09 Please describe the customer classes served by your reuse water utility

- 1.10 Please provide data on the count of your customers by class
- 1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class
- 1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area

- 1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?
- 1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?
- 1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?
- 1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?
- 1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.
- 1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?
- 1.19 Are customers required to connect to your reuse facilities when service is available?

Fernando Aranda, Rate Analyst
Aurora Water (City of Aurora, CO, Water Utility)
City of Aurora
Water Utility
Water, sewer collection and stormwater services
Part of the water fund - provide potable, raw and RECYCLED water services.
5 MGD scalping plant at Sand Creek provides tertiary treated reuse water to City owned parks and golf course for irrigation. 2017 investigating use by industrial customer for cooling tower.
Municipal
Potential to supply industrial cooling tower.
Aurora Reservoir mountain source water is blended with treated reclaimed water pulled from the South Platte river downstream from effluent discharge.
Not applicable

Aurora Water, CO

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market – getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Reduce demands on the potable supply, reduce flow to wastewater treatment utility and the fee to Metro Denver.
From water fund currently.
Rate relief requested by municipal customers so subsidizing the difference with revenue from water customers. \$1.25/kgal, \$497/AF

Aurora Water, CO

Section 3: Detailed Reuse Water Rate Structure Characterization

3.01	Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?	No
3.02	Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?	Not apparently evident from case study
3.03	Is reuse water consumption metered?	
3.04	Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?	Not relevant for city owned use
3.05	Does your rate structure have a take or pay provision for any customers?	Not relevant for city owned use
3.06	Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?	
3.07	Do you currently use seasonal rates?	Demand only in summer for irrigation now.
3.08	Do you currently have different rates for customers in different locations or zones?	No
3.09	Do you currently charge meter installation, tap, and/or connection fees for reuse service?	No
3.10	Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.	\$521,000/year to water division
3.11	What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?	Originally set rates at cost of service
3.12	How did you allocate costs between water/sewer/and reuse water services?	
3.13	How did you distribute reuse costs to different classes of customers or individual contract customers?	
3.14	How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?	Potable water customers are subsidizing the reuse.

Denver Water, CO

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Ty Bereskie
1.02 Name and address of agency	Denver Water
1.03 Location served	Denver
1.04 Organization and superior or subordinate units	
1.05 Please describe the utility services that your agency provides	Full time planner who deals with reuse customers. Rates handles the charges. Ty is counterpart of planner for policy. Non-potable plant built in early 2000. Ambitious master plan (big drought in 2002/2003). We have been adding customers consistency over 20 years. Not seeing demand on system we anticipated. We have a 30 MGD plant. Contract at 12MGD, we usually run lower than that. CO is conservative for uses of non-potable water. Still cannot add industrial laundromats. This past year we had toilet flushing added. We worked to get cannabis cultivation included, but failed for now (3% of industrial water use). FY2020 - pushing towards edible crops. Big continuous improvement event to figure out which direction we want to take. Heavily invested in this asset, but way underutilizing.
1.06 What is the nature of your reuse service	Overall demand is going down.
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Just under 100 customers. Developed system with idea power plant would use it. They switched to natural gas, so it reduced water they use. They have contracted minimums they have not taken for the past 5 years. Power station, 85% irrigation for parks for city / county; schools; one cooling tower for museum; Denver zoo for animal washdown. One of the approved uses. But they also have to have a potable source.
1.09 Please describe the customer classes served by your reuse water utility	Recycled water is by far our most expensive water. Significant pumping costs.
1.10 Please provide data on the count of your customers by class	
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Lower demand than what they had anticipated. Currently looking at what the future of reclaimed will be. Looking at regional partnerships. Transmission is a problem to implement master plan to reach other customers.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Non-potable 30 MGD plant
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	
1.19 Are customers required to connect to your reuse facilities when service is available?	

Denver Water, CO

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Rates manager: Fletcher Davis, Renee Davis. Discount on potable rates initially. We recently started to try and figure out how much we are subsidizing the water. So many regulatory issues. How much internal time are we putting into this. How much time are we spending, not just producing the water. decisions on treatment plant: half not being used, but things will require significant investments soon. Organizational direction and commitment to what we are going to do with it. No clear conclusion on planning process. Choosing by advantage tool.

Traditionally it was seen more of a side utility. Focus of reuse has switched to direct and indirect potable. The non-potable systems are getting forgotten.

Challenge between economics, public perception, (snow on the mountains gives impression of clean fresh water), regulations are hard to push through. No R.O, advanced oxygenation UV pilot test

We have SDCs for new development, significantly lower than potable water ones

Conversations to charging from giving it free. Raise prices slightly? You can irrigate on recycled system when in drought. Tried to figure out what the market is willing to do. Not going anywhere now. Pretty happy with current structure. Charging less is difficult to swallow. Charging more may turn customers off. It is not potable water. Exploring incentivize certain uses (rebate, lower rate if a perfect recycled water customer?) 11 approved uses. Raise use but not put us over the edge with irrigation in the summer.

Majority of uses only will happen in significant redevelopments. Align with planning to see what zoning issues etc. we may expect

Power Plant only contracted. Pay what you use. No additional fees for regulatory training or anything else. Exploring SDC discounts for new customers, cost sharing ideas (retrofitting a park, they will pay potable rate till paid off). Potable rates - we charge diff amounts for inside/outside, that does not extend to recycled water Recycled water - slightly higher than raw water.

Fort Worth, TX

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Andy McCartney, Senior Administrative Services Director
1.02	Name and address of agency	City of Fort Worth, 200 Texas Street, Fort Worth, TX 76102
1.03	Location served	City of Fort Worth
1.04	Organization and superior or subordinate units	City
1.05	Please describe the utility services that your agency provides	Water, sewer, reclaimed
1.06	What is the nature of your reuse service	Non-potable irrigation uses
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	Just small area with access to reuse line. 2005/2006 - reuse sales started, with water provided for fracking operations. Feasibility study for a backbone system from Village Creek WRF, some potential for expansion adjacent to City of Arlington.
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Only irrigation uses are served - golf courses and cooling tower water.
1.09	Please describe the customer classes served by your reuse water utility	4 customers all served as a single customer class: City of Euless (golf course for irrigation), City of Arlington (to irrigate Dunlop Park and a golf course), DFW Airport (used in their cooling tower process), and the Water Chase Golf Course.
1.10	Please provide data on the count of your customers by class	
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Fort Worth meters all reclaimed water service. It is a separate utility but the wastewater fund is subsidizing it. Approximately 1/2 million kgals of reclaimed sold.
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	None
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Some interest in the development community to installing reuse for irrigation in new residential areas, but when developers look at the cost of infrastructure they back off. There is more interest on the west side of town where planned development could be a driver long term, but transmission is not feasible until more infrastructure is installed in several future phases. There also has been interest from industry, but again, transmission lines have proven too expensive to install economically.
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	Not directly
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	A combination of city-owned reservoirs and reservoirs managed by the COE and the Tarrant Regional Water District.
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Incremental water supply costs have not yet become a primary driver in reuse system planning and management.
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	The City has constructed major transmission assets; developers would be required to install local assets and some extensions.
1.19	Are customers required to connect to your reuse facilities when service is available?	No

Fort Worth, TX

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Requests for water supply from the fracking industry initiated the provision of reuse water by the City.
Wastewater oriented
Awareness limited but positive
Retained earnings, no fees
Budget like it is a separate utility, but wastewater fund is subsidizing reclaimed. No debt. Retail wastewater committee approves of subsidizing reclaimed through wastewater charges. Minimal increase. \$500,000 budget; revenue
No direct impact
Market oriented, reflecting current water rates
Current price \$1.70/1,000gallons. The market price for reuse cannot be greater than the cost of potable water.
We budget for reuse as if it is a separate utility, but the wastewater fund is subsidizing reclaimed functions. There is no debt on the reclaimed system. The retail wastewater committee approves of subsidizing reclaimed through wastewater charges for policy purposes.

Fort Worth, TX

Section 3: Detailed Reuse Water Rate Structure Characterization

- 3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?
- 3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?
- 3.03 Is reuse water consumption metered?
- 3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?
- 3.05 Does your rate structure have a take or pay provision for any customers?
- 3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?
- 3.07 Do you currently use seasonal rates?
- 3.08 Do you currently have different rates for customers in different locations or zones?
- 3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?
- 3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.
- 3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?
- 3.12 How did you allocate costs between water/sewer/and reuse water services?
- 3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?
- 3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?

No
No
Yes
We apply a uniform volumetric rate, increased by inflation index (CPI) annually.
No
No
No
No
No
Reuse generates approximately \$500,000 annually
Market pricing constraints led to the prices.
Through the budgeting process
No
Our budgeting process identifies reuse costs effectively; revenue generation constrained by the market.

Fulton County, GA

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	David Clark, Director of Public Works
1.02 Name and address of agency	Fulton County, Georgia
1.03 Location served	Portions of northern Fulton County
1.04 Organization and superior or subordinate units	Department of Public Works
1.05 Please describe the utility services that your agency provides	Water, sewer, reuse water
1.06 What is the nature of your reuse service	Non potable reuse water provided for irrigation
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	Reuse water is provided in the part of the northeast portion of the county. Water and wastewater services are provided throughout northern Fulton County north of the Chattahoochee River. The area served by the reuse system is currently a small portion of the water and sewer service area.
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	All of the County's customers are large irrigation users. Each is provided with irrigation water at a single point of connection. No wholesale users are served.
1.09 Please describe the customer classes served by your reuse water utility	All of the customers are using reuse water for irrigation and all customers are provided reuse water under the same terms.
1.10 Please provide data on the count of your customers by class	The County's users consist of 6 golf courses, 2 large churches, and the municipal park system of the City of Johns Creek.
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	The County is able to provide 5 mgd of reuse water to its existing customers. Actual usage is less during most years when rainfall is adequate for customer needs.
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	None
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	The reuse system is not projected to grow substantially during the next 5-10 years. Demand from existing customers is expected to be relatively stable and the distribution system is not currently planned for significant expansion. Over the longer term, two other wastewater treatment plants could have the potential to provide reuse water, depending on state permitting and other requirements.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	Drought restrictions on the use of potable water for irrigation would increase demand during times of drought. State policies regarding water use in metropolitan Atlanta could promote or deter irrigation uses for reuse water depending on stream-flow requirements related to water rights issues involving Florida and Alabama.
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	The Chattahoochee River provides potable water for the County's service area. Current supply allocations are adequate; long term regional water planning and coordination activities are ongoing to assure adequate supplies for the foreseeable future.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Reuse water investments were not initially provided in response to high costs of potable water supply. Future potable supplies could require proportionately higher investments, which would have the potential to impact economic analyses of additional investment in reuse facilities.
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Fulton County
1.19 Are customers required to connect to your reuse facilities when service is available?	No

Fulton County, GA

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>A public-private initiative resulted in the construction of the Cauley Creek Water Reclamation Facility to provide capacity to serve new development. Reuse water treatment capability was provided due to state initiatives encourage land application of wastewater effluent. The facility has since been decommissioned and reuse water is being produced at the County's new John's Creek Environmental Campus.</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>All reuse water is currently produced at John's Creek which is a wastewater operation.</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>Public awareness is limited, but the County's users gain public perception benefits from being able to maintain green space with reuse water during dry periods. The public accepts reuse water for the current mix of uses positively.</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>Initial costs were funded with reserves. There are no reuse impact fees.</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p>Potable water use is reduced by a matching amount to the reuse water sold each year. Though the reuse service area is limited, the reduction in potable demands during time of water supply restrictions is helpful.</p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>No significant impact.</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>The County is pricing reuse water to reflect its investment to provide reuse treatment and distribution capacity, the price of potable water, and historic pricing agreements dating back to the creation of the reuse system. The gradual transition from original pricing towards cost based pricing is nearly complete.</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> • Establishing a market – getting/retaining reuse customers • Keeping reuse investment from burdening other customers • Recovering the full capital and/or operating cost of reuse • Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure • Reflecting the benefits derived from the reuse program • Other (specify) _____ 	<p>The initial pricing was structured to reflect market conditions as the facility needed to be able to deliver reuse water for effluent disposal purposes. Water supply issues were not considered at that time.</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> • Overcoming retrofit costs borne by NPR customers • Overcoming perceptions of lesser quality for reuse water • Pressure to price reuse water below the price of potable water • Cost recovery: recovering the full capital and operating costs of providing reuse water • Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools • Other (specify) _____ 	<p>After the County began producing reuse water at John's Creek, the reuse rate was set to match the County's irrigation water rate in response to guidance from the Metro North Georgia Water Planning District. This higher rate for reuse water was implemented on an interim basis until cost reviews and studies could support a revised reuse rate. The analysis is complete and it is expected that lower reuse rates will be considered in the near term, restoring a lower rate relative to potable water, and in alignment with identified reuse system costs.</p>

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>No</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>No</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Yes</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>A single, non-tiered volumetric rate of \$6.73 per thousand gallons is currently being charged to match the current potable water irrigation rate. The County expects to consider adopting a reuse-specific rate of approximately \$3.75 per thousand gallons in the near future.</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>No</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	<p>No</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>No</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>No</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>No</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	<p></p>
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>The identified reuse system investment was \$13 million. A 25 to 30 year payback was the target. Because reuse water is treated to reach the same water quality standards as all wastewater volumes, the focus was on initial investment and incremental investment, not on treatment processes.</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	<p>Reuse water costs were identified with a primary focus on incremental investments required. The quality of wastewater treatment at the County's John's Creek facility meets reuse standards, so the cost focus is on additional valves, piping, and controls.</p>
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	<p>No differentiation between customer types</p>
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>The recently calculated and proposed rate of approximately \$3.75 per thousand gallons for reuse water reflects the allocated costs and is in balance with the County's other rates and charges.</p>

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Juli Crawford, Manager, Financial Planning and Rates
1.02	Name and address of agency	JEA, 21 West Church Street, Jacksonville, FL. 32202
1.03	Location served	Major portions of Duval County, and some portions of St Johns, Clay, and Nassau Counties, FL
1.04	Organization and superior or subordinate units	JEA is a city-owned authority providing electric and water-related services
1.05	Please describe the utility services that your agency provides	Retail and wholesale potable and reclaimed water services as well as sewer and electric service
1.06	What is the nature of your reuse service	Irrigation service for residential, commercial, and bulk reclaimed water customers. One of the bulk customers - resale service to St. Johns County.
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	See 1.03 above
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Retail and wholesale reclaimed water service for residential, commercial, and bulk customers for irrigation purposes. Resale to St. Johns County primarily used for residential irrigation
1.09	Please describe the customer classes served by your reuse water utility	See 1.08 above
1.10	Please provide data on the count of your customers by class	RES-267,849, COM-17,503, MULTI-2,955, Irrigation RES- 37,936*, Irrigation COM- 4,610* *(Includes reclaimed customers)
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Potable water(KGALS) Residential 17,156,987, Multi-Family 4,049,321, Commercial 9,679,970, Irrigation - Res. 3,256,340*, Irrigation - Comm. 3,187,234* Total Potable 37,329,852 KGALS *(Includes reclaimed customers)
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	In addition to irrigation, also power generation cooling needs and fire protection
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Future growth dependent on geographic areas of expansion. Not likely to provide reuse water in infill areas of the city, but for new development, many neighborhoods are being built with dual meters and reclaimed water lines for irrigation. Substantial growth is occurring on the south side of town.
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	No
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	JEA relies on the Floridan Aquifer for water supply. Regional water management planning practices have led to a water use permit process for water utilities. These permits are starting to require the provision of reuse water for irrigation purposes the extent feasible. As such, water supply and regulations are a primary driver for expansion of the reuse system.
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	No, but the regulatory process is driving expansion of the reuse system.
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	227 miles of reclaimed water distribution facilities
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	JEA owns the distribution system, but in certain instances of new development, the developer will put in the local distribution lines including reclaimed
1.19	Are customers required to connect to your reuse facilities when service is available?	No

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>JEA's consumptive use permit requires the authority to utilize reuse to the extent feasible; this requirement is consistent with numerous JEA environmental objectives to be good stewards of water supply resources.</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>JEA subscribes to a forward-looking approach for managing water supplies that values all water sources similarly. This "one-water" concept leads JEA to price potable and reuse water to reflect the same ultimate value. As such, reclaimed water functions are most closely aligned with the water service line from a pricing perspective.</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>Awareness is broadening, and there is appreciation for the environmental sensitivity reflected by the provision of reuse water for irrigation. Acceptance is high in areas where retail service is available.</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>Through rates and capacity fees. The reclaimed water costs are reflected in JEA's dual meter impact fee structure which reflects incremental costs for water capacity, whether potable or reuse water is used for irrigation. JEA also has an environmental surcharge that has been used for environmental and regulatory programs, and has likely been a source for reclaimed projects.</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p>Availability of reuse water has resulted in lower potable water demands where available. The effects on total water use are unclear and are being studied.</p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>No because reuse water has been priced the same as potable irrigation water.</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>Pricing parity with Potable water irrigation rates.</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> • Establishing a market -- getting/retaining reuse customers • Keeping reuse investment from burdening other customers • Recovering the full capital and/or operating cost of reuse • Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure • Reflecting the benefits derived from the reuse program • Other (specify) _____ 	<p>JEA approaches pricing from a policy perspective first and focuses on the goals and objectives of all key policies. In this case, cost of service principles, conservation imperatives, and maintaining good stewardship over water resources are primary drivers.</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> • Overcoming retrofit costs borne by NPR customers • Overcoming perceptions of lesser quality for reuse water • Pressure to price reuse water below the price of potable water • Cost recovery: recovering the full capital and operating costs of providing reuse water • Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools • Other (specify) _____ 	<p>We have no major concerns. Reuse water can only be priced "so high" before market constraints and public perception would become a problem. For JEA, even at pricing parity with potable irrigation rates, reuse revenues still might not be capturing the full COS, depending on allocation assumptions. But the "one water" concept suggests that the idea of reuse water bearing it's fully allocated costs might not be of primary importance - JEA does recover it's full costs to provide all water management functions from water customers and that is the most important objective.</p>

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>Wholesale uses are served at a contract rate that differs from retail pricing</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>Yes</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Yes</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>Yes it is tiered through an inclining rate structure for residential and commercial. Bulk rates not tiered.</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>No</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interrupt ability, proximity to your facilities, or alternate sources of supply?</p>	<p>Yes within the bulk rate category but not for residential or commercial customers</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>No</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>No</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>Yes</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	<p>Fixed revenues are approximately \$150,000 and volumetric revenues are about \$7 million based on 2018 rates exclusive of environmental charge and regulatory fixed fees</p>
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>Reuse rates are set equal to potable water rates for retail</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	<p>Through established cost allocation principles during our rate study processes.</p>
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	<p>See 3.12 above</p>
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>The incremental costs of reuse capacity and service are unimportant individually because of our "one water" approach, which unifies and simplifies cost allocations. Standard COS allocations for reuse may be necessary for some utilities, but JEA's one water approach is focused on water supply for all uses over the long term, and as such, treats reuse supplies on par with groundwater supplies.</p>

King County, WA

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Jacque Klug, Recycled Water Project Manager
1.02 Name and address of agency	King County
1.03 Location served	201 S. Jackson Street, KSC-NR-0512, Seattle, WA 98104
1.04 Organization and superior or subordinate units	County
1.05 Please describe the utility services that your agency provides	Regional wastewater provider for the greater Seattle metro area. We serve just over 1 million people. Also do limited recycled water production from our facility.
1.06 What is the nature of your reuse service	Non-potable recycled water
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Primarily irrigation. External customers are all irrigators. We also do some recycled water at King co facilities for more commercial recycled water, toilets and urinal flushing. Also one of the jurisdictions for sewer flushing. Recycled water for environmental purposes as well (to restore a wetland and create habitat).
1.09 Please describe the customer classes served by your reuse water utility	We direct sell to retail. Wholesale to one city.
1.10 Please provide data on the count of your customers by class	8 external customers, most are irrigation. 1 customer who uses non-potable for street sweeping.
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	108 million gallons to external customers in 2017, we used an additional 621 million gallons for internal uses at the facilities
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	Flushing toilets, environmental
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Anticipate some growth in adding customers, generally within the same customer class in the near term.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	We have regulations. There are treatment requirements for the diff classificaitons of use. WA state recycled water is for non-potable and indirect potable uses. There is a pathway to apply for do potable reuse (waiver from state). That allowance or pathway was just established in 2018 by a new rule in the state. We will not pursue that in the near term.
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Abundant water supply in the region. More demand for water for agricultural uses. Environmental enhancement. Restoring stream flows, watershed functions, creating habitat for fish. State wide use and it gives utilities rights to get drinking water right permits to draw water from the aquifer.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Near term will continue same path, we know there are varibles that could change growing concern from the state regulatory agency about trand? Loading and keeping it sound. If we are not recycling the water? There could be in the future. More of a driver to get WW out of the waterways. climate change and what it could do to our hydrology.
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	Treatment capacity - we can produce at our largest 11MGD, at peak of summer distribution we do about 2MGD, the other facility is capable of up to 3MGD, and we generate about 1 MGD.
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Agency installed all the pipelines.
1.19 Are customers required to connect to your reuse facilities when service is available?	Not required

King County, WA

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>We first started in 1997, 22 years ago. At that time it was more to develop additional water supply for the region. We built a pilot facility in the late 90s and have been operating it since. We have had more of a driver to diversify how we manage our wastewater effluent. When we built our newest plant in 2007-2011, state required as condition of the permit for our effluent outfall into the marine environment to develop recycled water program and alternatives to discharging to marine waters. Not a hard regulatory limit, but we do have to demonstrate study progress.</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>A little bit of both. Mostly as a wastewater component, with an added regional benefit of supplying water.</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>We survey our rate payers every 2 years, and the program is one of the most popular program we do. 70-80% see it as very positive, support it. Overall a lot of support.</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>Funded as part of wastewater plants. No reuse impact fees.</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p></p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>Revenue from recycled water covers our operational costs for the system. We are new to it still and trying to figure out the financing piece. No set water rates, develop on case by case basis. Our existing rate structure covers our O&M cost. No capital cost recovery and investment.</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>Combination of cost based and market pricing. We benchmark it off the regional wholesale potable water rates. It is a percentage of that. It varies across our facilities because we have different O&M costs as well. We serve some water users that not traditional potable water supply customers, a few customers that are more agricultural in nature, and for them we charge a base rate that is at the higher rate, and then a declining block rate from there after a certain amount of water. We do require for all customers that they use a minimum volume of water. We serve customers that previously self supply, and look at recycled water for more sustainable/reliable water supply to keep water in rivers for fish and wildlife. For those we recognize there is a market rate (cost to run their pumps). We factor that into the pricing. That feature has made it difficult for us as utility to set water rates, because each customer has unique situations.</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> ● Establishing a market – getting/retaining reuse customers ● Keeping reuse investment from burdening other customers ● Recovering the full capital and/or operating cost of reuse ● Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure ● Reflecting the benefits derived from the reuse program ● Other (specify) _____ 	<p>Yes, extensive discussions, but still a work in progress.</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> ● Overcoming retrofit costs borne by NPR customers ● Overcoming perceptions of lesser quality for reuse water ● Pressure to price reuse water below the price of potable water ● Cost recovery: recovering the full capital and operating costs of providing reuse water ● Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools ● Other (specify) _____ 	<p>We have been more on the take it as it comes situation, but we recognize that is an issue. If there is potential for influencing the long term use, increase the use, then it would change our thinking of what is recycled water utility benefit versus wastewater utility benefit. In talking to other peers, the initial driver might be a wastewater driver, to get the discharge lower. There is more desire and need for the recycled water. Aware of how to build any pricing in the long term.</p>

King County, WA

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>Unique for each customer</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>Almost like a fixed fee, volumetric but minimum volume required. 1/3 of the summertime wter use that we charge for whether they use it or not. And the volumetric after the minimum is in a declining bloc structure.</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Yes</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>Yes</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	<p>Yes, each customer has unique rates</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>We operate seasonally just because no demand for water outside of the 4 month dry season.</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>Yes</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>No customer connection fee, part of the our process of working with customers since it is such a small utility. Utility pays for meter and any backflow prevention devices. Any modifications are paid for by the customer. Sometimes they need to do more extensive modifications (booster pump, distribution piping, we look at it and work through that to settle on a rate). It factors in their cost to connecting and include some recovery cost</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>Recover O&M costs, work with each customer to understand their cost and set rates as a combo of recovering some potential capital keeping in mind what each customer also has to pay to connect to the system.</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	<p>Each customer is unique</p>
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>Recover O&M only</p>

Long Beach, CA

Section 1: Reuse Water Utility Characterization

- 1.01 Name and title of utility professional being interviewed
- 1.02 Name and address of agency
- 1.03 Location served
- 1.04 Organization and superior or subordinate units
- 1.05 Please describe the utility services that your agency provides
- 1.06 What is the nature of your reuse service
- 1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.
- 1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied
- 1.09 Please describe the customer classes served by your reuse water utility
- 1.10 Please provide data on the count of your customers by class
- 1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class
- 1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area
- 1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?
- 1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?
- 1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?
- 1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?
- 1.17 What is the size and general configuration of your distribution system: miles of pipe, storage, area-wide versus specific runs, etc.
- 1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?
- 1.19 Are customers required to connect to your reuse facilities when service is available?

Dean Wang
Long Beach Water Department, 1800 F Wardlow Rd, Long Beach CA 90807
City of Long Beach
Long Beach Water Department, public City of Long Beach but governed by a Board of Commissioners separate from the City Council.
Water, sewer conveyance (not treatment), reclaimed
Non-potable, indirect potable, direct potable - obtain sufficient narrative to understand fully
The reuse system serves mostly just the eastern portion of the overall service area
Reuse water is being used for landscape irrigation, industrial non-potable, and seawater barrier injection. All customers are retail customers and there are no wholesale customers.
LBWD recycled water customers include public and private irrigation customers, such as parks, schools, golf courses, cemeteries, and nurseries. The recycled water is also used by THUMS, a consortium of oil companies, which uses the recycled water to re-pressurize offshore oil-bearing strata in order to prevent land subsidence. The recycled water is also used for seawater barrier injection after receiving advanced treatment
1 industrial, 1 seawater barrier, 127 irrigation
Delivered volumes (AF)
Commercial 13,372 potable, 0 reuse
Industrial 317 potable, 1,724 reuse
Irrigation 1,791 potable, 3,397 reuse
Duplex 2,953 potable
Multi-Family Residential 14,526 potable
Single-Family Residential 17,228 potable
Seawater Barrier 3,997 potable, 374 reuse
Seawater barrier injection and re-pressurize offshore oil-bearing strata in order to prevent land subsidence
No major geographic expansion is expected in the next 5-10 years. Seawater barrier demands are expected to increase, and other demands are expected to remain relatively stable.
Potable water restrictions are not expected to significantly impact recycled water demand.
Groundwater is the primary potable water supply, and imported water from the Metropolitan Water District provides any additional supplies needed.
New supplies are projected to be significantly more expensive than existing supplies
923 miles of pipe in largely grid configuration with approximately 35 million gallons of storage
Long Beach Water Department builds and owns the linear assets.
Yes, if deemed cost effective.

Long Beach, CA

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?

- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

	LBWD was established in 1911. LBWD started its recycled water program in 1978 to help meet projected water demands for a growing population.
	More closely aligned with water as the reuse water distributed by LBWD is treated by the Sanitation District of Los Angeles County (LACSD).
	The public is aware and accepting of reuse water for the non-potable uses approved by LBWD and LACSD.
	There are no impact fees.
	Reuse water has directly offset the use of potable water and therefore reduced total potable water demand. Much of the reuse water is used for irrigation, which is what causes the majority of LBWD peak demands in the summer. Reuse water reduces peak potable water use. Reuse water has also offset industrial water use. Total water demand (potable and reuse) has been declining due to decrease in potable water demand, but reuse water demand has increased and is projected to continue to increase.
	No
	Cost of Service Study
	Cost of Service Study
	Pressure to price reuse water below the price of potable water

Long Beach, CA

Section 3: Detailed Reuse Water Rate Structure Characterization

- 3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?
- 3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?
- 3.03 Is reuse water consumption metered?
- 3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?
- 3.05 Does your rate structure have a take or pay provision for any customers?
- 3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?
- 3.07 Do you currently use seasonal rates?
- 3.08 Do you currently have different rates for customers in different locations or zones?
- 3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?
- 3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.
- 3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?
- 3.12 How did you allocate costs between water/sewer/and reuse water services?
- 3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?
- 3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?

One for all customer classes
Service charge same as potable water
Yes
Volumetric rate includes peaking, non-peaking and interruptible rates, otherwise one tier
No
No
No
No
The fee schedule for reclaimed services starts on page 88 in Appendix A of the attached Rules & Regs. Charges for potable and reclaimed are the same.
Volumetric: FY 18 \$3,337,945; FY 17 \$4,017,508; FY 16 \$3,099,810; Daily: FY 18 \$279,236; FY 17 \$245,715; FY 16 \$227,798
Cost of Service Study
Cost of Service Study
Cost of Service Study
Cost of Service Study

Loudoun Water, VA

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Micah Vieux, Business Programs Manager
1.02 Name and address of agency	Loudoun Water
1.03 Location served	Eastern Loudoun County, Virginia
1.04 Organization and superior or subordinate units	Independent Authority
1.05 Please describe the utility services that your agency provides	Water, Sewer, Reuse
1.06 What is the nature of your reuse service	Non-potable reuse for data centers and commercial irrigation
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	The reclaimed water service area is in close proximity to the Loudoun Water wastewater treatment plant. The reclaimed water service area is a smaller sub-area of Loudoun Water's Central System service area.
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Reuse water is only provided to commercial customers. Used for data center cooling and irrigation.
1.09 Please describe the customer classes served by your reuse water utility	The primary user of reuse are data centers for cooling. There is a small amount of commercial irrigation that utilizes the reuse water.
1.10 Please provide data on the count of your customers by class	Loudoun Water serves 26 commercial customers with reuse
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Residential potable - 4,968,000 (tgal) , Commercial potable - 2,505,000 (tgal) , Reuse - 487,000 (tgal)
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	99% of reclaimed water sold is used for data center cooling
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	The primary driver for Loudoun Water reuse is the continued growth in the data center market. Plans do not exist to expand service outside of this primary customer class.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	No
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Loudoun Water purchases wholesale potable water from Fairfax Water, while also providing potable water from our own the Trap Rock Water Treatment Facility, which draws water from the Potomac river. The Potomac water supply will be sufficient to meet future demands and additionally Loudoun could purchase more water from Fairfax Water.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Loudoun Water has already made the investment to secure a long-term water supply by constructing the Potomac Water supply project (intake, pump station, pipe line, storage and treatment). Incremental increases in supply will be relatively cost effective from this point forward
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	The Reclaimed water distribution system consists of two 1.5 MG storage tanks, a pump station and 14 miles of pipeline
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Loudoun water and local developers have constructed linear assets. All linear assets are owned by Loudoun Water after the developer deeds the assets to the utility.
1.19 Are customers required to connect to your reuse facilities when service is available?	No

Loudoun Water, VA

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market – getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Our primary drivers were the recognition of a "waste-to-value" opportunity that could support water resource development, manage demand on the potable system, and eliminate nutrient discharge to the Chesapeake Bay.
Generally associated with wastewater because the supply is provided from the wastewater treatment plant.
Loudoun Water has not experienced challenges with public acceptance or understanding of reclaimed water for non-potable use.
The assets were primarily funded with the issuance of debt. A component of the water and sewer impact fees (availability fees) are designed to provide funding for the retirement of the debt and funding of reuse infrastructure
Since reuse water is primary provided to new constructed data centers (which were not potable water customers before), their has been limited direct impact on existing potable water demands. Reclaimed water demand accounts for 4% of total water demand in our service area
No
Reuse water is priced based a cost of service analysis. The analysis examines the staff time, energy and chemical required to meet the reuse demands
Cost of service analysis underpins reuse pricing. Revenues collected from reclaimed water sales cover reclaimed water operations and maintenance costs. Capital cost recovery for system infrastructure is funded by dedicating \$422 from the availability charges associated with each ERC added to our system.
Reclaimed water is priced at less than half of the potable water rate while covering the utility's operations and maintenance obligations. The price point is generally viewed as compelling, as evidenced by growth in our reclaimed customer base from 12 to 30

Loudoun Water, VA

Section 3: Detailed Reuse Water Rate Structure Characterization

3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?	No
3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?	No
3.03 Is reuse water consumption metered?	Yes
3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?	Uniform volumetric rate
3.05 Does your rate structure have a take or pay provision for any customers?	No
3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?	No
3.07 Do you currently use seasonal rates?	No
3.08 Do you currently have different rates for customers in different locations or zones?	No
3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?	Yes
3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.	2015 - \$620,000, 2016 - \$680,000, 2017 - \$730,000 - all revenues are variable no fixed charges
3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?	The reuse rates are based on a cost of service analysis. Loudoun recently adopted increases to the reuse rates for the next three years with increases linked to changes in wastewater rates (3.5% increase per year).
3.12 How did you allocate costs between water/sewer/and reuse water services?	The reuse rates are based on the costs specifically associated with providing reuse water. 2 FTEs, chemical, engineering and 50% of annual depreciation on the reuse system. Water or sewer costs were not allocated to the reuse rates.
3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?	Uniform rate for all customers
3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?	The reuse rates fund the incremental cost of providing reuse water. The rates are likely under-recovering the true full cost of providing the service since they are based on the incremental costs.

Miami Dade, FL

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Dr. Douglas Yoder
1.02 Name and address of agency	Miami-Dade Water and Sewer Department 3071 SW 38 Avenue Miami, FL 33146
1.03 Location served	Miami-Dade County
1.04 Organization and superior or subordinate units	Public entity serving the City of Miami, Dade County, Florida, and through wholesale agreements, municipalities within Dade County, Florida
1.05 Please describe the utility services that your agency provides	Water and Sewer Service to retail and wholesale customers
1.06 What is the nature of your reuse service	Existing reuse primarily serves as process water at the Department's wastewater treatment plants. Significant additions to the Department's reuse system are in the planning stages in order to comply with Ocean Outfall Legislation requirements.
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	MDWASD does not provide reuse to retail customers. Reuse to retail customers is not anticipated due to the high capital costs that would be required for this infrastructure. Planned future reuse efforts primarily focus on providing cooling water to planned Florida Power & Light expansion units.
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Existing reuse water primarily serves as process water for the Department's WWTPs. As part of Ocean Outfall reversal requirements, the Department is planning to provide reuse to Florida Power & Light for use as cooling water for power generation units and cooling water canals. While FP&L is a planned future reuse water user, the Department does not provide wholesale reuse service. The original plan for FP&L was to use reuse water for cooling of two planned nuclear units. However, these units have been delayed beyond the deadline for Ocean Outfall reversal. The Department and FP&L are discussing new options to provide reuse for cooling water at the existing FP&L unit 5 and for cooling of cooling water canals. An additional future option could include Biscayne Bay Coastal Wetlands Rehydration (everglades). This option is anticipated to have similar treatment requirements as the FP&L canal cooling water.
1.09 Please describe the customer classes served by your reuse water utility	Future reuse water is planned for large bulk customers.
1.10 Please provide data on the count of your customers by class	Not Applicable
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Reuse Process Water: North District WWTP - 4.44 MGD Central District WWTP - 7.84 MGD South District WWTP - 4.17 MGD Planned Reuse Projects: Floridan Aquifer recharge - 27.6 MGD (project is on hold as it does not meet desired economic benefit needs. An issue with the project is very high pumping pressures and cost to recharge the geologic layers of this portion of the Aquifer) FP&L Cooling - 90 MGD
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	WWTP Process water, possible aquifer recharge, planned cooling water applications
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Growth in the reuse system is planned to occur in non-irrigation applications.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	The driver for planned reuse projects is Ocean Outfall Legislation. Recent customer usage trends indicate future water supply may be more plentiful than anticipated, with the Department having supply through 2040.
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	The Department draws its raw water primarily from the Surficial Aquifer System's Biscayne aquifer, which underlies an area of approximately 3,200 square miles in Miami-Dade, Broward, and Palm Beach Counties. Current supply is sufficient to meet anticipate future demands.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	Reuse infrastructure costs are a limitation in providing retail reuse service.
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	Primarily limited to WWTP process water
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Tentative planning, the Department and FP&L are in discussion regarding how capital and operational cost would be split. Capital costs are estimates at \$400M and annual Operation Costs at \$15-18M.
1.19 Are customers required to connect to your reuse facilities when service is available?	Not Applicable

Miami Dade, FL

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?

- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Regulatory requirements are the driver for the Department's planned reuse system.
Reuse projects are more closely aligned with wastewater as Ocean Outfall Legislation is the driver for reuse.
Retail reuse is not available to Department customers
Planned funding is via FP&L
Reuse would take the place of Ocean Outfall effluent disposal, with little impact on potable water.
No, as the Department does not provide reuse to retail customers
Pricing discussions are being held with FP&L, it is likely FP&L would cover all or part of the operating cost to treat and deliver reuse water to their facility. FP&L may construct and operate a "polishing" facility for final treatment of reuse water delivered for their use.
See above.
The Department is interested in understanding pricing considerations of other utilities, specifically addressing conventional wisdom that reuse water must be priced below potable water.

Moulton Niguel Water District, CA

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Drew Atwater, Director of Finance and Water Resources
1.02 Name and address of agency	Moulton Niguel Water District, 27500 La Paz Rd. Laguna Niguel, CA 92677
1.03 Location served	
1.04 Organization and superior or subordinate units	
1.05 Please describe the utility services that your agency provides	Potable water, recycled water and wastewater
1.06 What is the nature of your reuse service	Non-potable only
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	6 cities in south orange county, Laguna Niguel, Michel vielle, Laguna hills, dana point. Parts of some of them.
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	All dedicated to irrigation. We have slopes, medians for homeowners associations, cities, golf courses, commercial office parks, landscaping areas. About 2/3 of outdoor dedicated landscaping irrigation is served by recycled water.
1.09 Please describe the customer classes served by your reuse water utility	System was started in 1968.
1.10 Please provide data on the count of your customers by class	All one customer classes. 1,368 customers.
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	7000 acre feet a year
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	None
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Looking in our planning efforts at 1300 acre feet of existing converting potable accounts. Studies for direct potable reuse over the next 10 years.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	All recycled water has to be used on site. No run-off. There are strict requirements on title 22 water quality. There is salt nutrient management requirement from the regional quality control board in San Diego. We can't drink it yet no matter treatment without some sort of environmental buffer but that will hopefully change within the next 5 years.
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	100% dependent on imported water from 2 sources for potable water. We have enough water to meet our service area, we are built out, but long term risks, and recycled water helps to mitigate those risks. We reuse 60-70% of the wastewater of our service area. We want to get to 100%.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	We do need to replace the entire treatment train in the next 10 years. It is in the budget and have funding for it. Salt management is an important issue. Potential it may increase operating cost. Not a dramatic change.
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	150 miles of pipeline, 2 of the wastewater treatment plant, 7000 acre feet a year
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	New developers pay for the new lines. The system we are expanding is to extend to existing customers.
1.19 Are customers required to connect to your reuse facilities when service is available?	New development is required to connect to recycled water as long as it is available.

Moulton Niguel Water District, CA

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Water reliability, partnership with local golf courses who did a 50/50 match to build the initial system. Treated secondary water. Supply constraint area, reuse what we have.
Water
Very positive. Very supportive. Because we have such an extensive system, most landscapes have a purple sign in front of it, so public has immense support for use of recycled water.
Recycled water revenue is \$6M out of a total \$90M. Local property tax but potable water system is over \$30M and wastewater \$22M. Rate revenue is pretty small.
Cost-based, water budget based rate structure for the recycled customers.
Cost of service done
Continue cost based, we do incremental adjustments to our rates and review them every couple of years. We see the cost of recycled water go up about the same as potable water.

Moulton Niguel Water District, CA

Section 3: Detailed Reuse Water Rate Structure Characterization

3.01	Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?	No, one customer class
3.02	Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?	Rates vary by tier, about 30% lower than water rates. Fixed charge, and volumetric by tier
3.03	Is reuse water consumption metered?	Yes
3.04	Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?	Yes, tiered, it is a California requirement
3.05	Does your rate structure have a take or pay provision for any customers?	No, but customers are required to use recycled water, but if landscape is potable water, they need to pay an impact fee. But if non-potable irrigation, there is no impact fee. It's a demand offset fee, in addition to our standard impact fee. This is if they are too far to connect to the recycled water system.
3.06	Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?	Recycle system goes down to 0 or 12,000 acre feet in a month. Close to 0 when it rains a lot. Very peaky system. Definitely reduced the peaking of the potable system.
3.07	Do you currently use seasonal rates?	Water budget based rates. We measure evapotranspiration every day. Targets inefficient use.
3.08	Do you currently have different rates for customers in different locations or zones?	No
3.09	Do you currently charge meter installation, tap, and/or connection fees for reuse service?	No
3.10	Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.	About \$6M in total
3.11	What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?	Cost of service
3.12	How did you allocate costs between water/sewer/and reuse water services?	Cost of service
3.13	How did you distribute reuse costs to different classes of customers or individual contract customers?	One class, all irrigation
3.14	How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?	Cost of serve, rates designed on marginal cost. Having the recycled water system helps provide more stability in our revenue.

Naples, FL

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Mr. Robert Middleton
1.02	Name and address of agency	City of Naples, FL 380 Riverside Circle, Naples, FL 34102
1.03	Location served	Naples Area
1.04	Organization and superior or subordinate units	
1.05	Please describe the utility services that your agency provides	Water, Wastewater, Stormwater, and Reclaimed Water
1.06	What is the nature of your reuse service	Irrigation and fire protection
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	Select areas within City have reuse service directly from the transmission system. Additionally, the City is expanding their reuse system into additional neighborhoods, via strategic CIP distribution system projects
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Irrigation and fire protection
1.09	Please describe the customer classes served by your reuse water utility	Residential, Commercial, Governmental, and bulk users, inclusive of golf courses
1.10	Please provide data on the count of your customers by class	FY19 1929 accounts. Bulk 11, Government 142, Commercial 112, County 4, Multifamily 175, Residential 1485
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Water 4,629,710Kgals (2015), 4,468,439 Kgals (2016) 4,713,150 Kgals 2017 Reuse 1,786,645 Kgals (2015), 1,788,309 Kgals(2016), 2,130,719 Kgals 2017
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	Fire Protection which clearly is a secondary use to irrigation
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Growth is driven by strategic CIP/system expansion, mainly distribution related, to add reuse customers in a reasonable economic fashion
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	None
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Wells and it remains sufficient at this point for potable water needs
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	N/A
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	The City's reuse system contains 307,373 feet of distribution main.
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	City of Naples
1.19	Are customers required to connect to your reuse facilities when service is available?	No

Naples, FL

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Environmentally lead to reduce effluent disposal to Naples Bay and then also serves to reduce potable water demand
When we first started looking at the rate, we did not meet full COS, who should pay. Irrigation/supply. More aligned with water. More aligned with water as an additional water supply for irrigation.
The public for the most part have a positive response to reuse water. The City currently has a 64% connection.
Through water, sewer, and reuse rates collectively. No impact fees charged to connect to reuse system.
Availability of reuse has reduced potable water demand for irrigation
Yes. City strategically manages expansions to reuse system to avoid water and sewer adverse revenue loss as customers migrate to the reuse system
Water and sewer rates partially subsidize full cost recovery of reuse system costs.
Yes. Customers participated in a survey to determine level of interest in using reuse water. As part of the rate analysis, full cost recovery was analyzed but not supported by City Council. The rate was established to increase connection to the reuse system. The benefits of reuse water as an alternative to potable water use for irrigation. Environmental benefits and long term capital plant modification cost was delayed many years.
No pricing concerns. We know we are not full cost recovery, but our water/sewer rates are enough to keep us above water.

Naples, FL

Section 3: Detailed Reuse Water Rate Structure Characterization

3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?	Bulk rates differ from the other uniform rate structures since all bulk customers are interruptible
3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?	Yes a fixed fee plus a volumetric rate per 1000 gallons
3.03 Is reuse water consumption metered?	Yes through a separate meter
3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?	Yes. It is a flat volumetric rate
3.05 Does your rate structure have a take or pay provision for any customers?	No
3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?	Bulk users are subject to interruption but all others are not.
3.07 Do you currently use seasonal rates?	No
3.08 Do you currently have different rates for customers in different locations or zones?	No
3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?	Yes
3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.	About \$1.9-\$2M in sales.
3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?	Combination, cost of service, market approach also, different alternatives, rates don't fully recover COS.
3.12 How did you allocate costs between water/sewer/and reuse water services?	2014 COS study. Combination of both clear reuse, and some allocation of shared costs and parcel out some of the reclaimed stuff.
3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?	Only applicable for the purposed of rate setting for bulk customers due to the interruptible nature of their service
3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?	Do not provide full cost recovery

Orange Water and Sewer Authority, FL

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Stephen Winters, Director of Finance and Customer Service
1.02	Name and address of agency	OWASA, 400 Jones Ferry Road Carrboro, NC 27510
1.03	Location served	Serve UNC and a church
1.04	Organization and superior or subordinate units	Independent Authority
1.05	Please describe the utility services that your agency provides	\$12.5M to construct the facility. On the same footprint as the WWTP. Some of the water from the WWTP goes to the creek, and some is diverted into the reclaimed water treatment area. It goes additional treatment and piped up to the UNC.
1.06	What is the nature of your reuse service	Non-potable reuse
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	2 customers: largest UNC - went online in early 2009, reason we got into it, we partnered with the university (some entity mandated that state organizations reduce their potable water use), impetus for university to partner. University paid for construction of the facility They reduced their potable water use by 25%. they use it for irrigation around the campus, sports fields, flushing in some of the newer buildings. primary use is in the water cooling towers for HVAC. Second customer is a large church campus that is along the pipeline, very easy for them to plug in. Church is mostly for irrigation, an addition on their facility to flush toilets. They use a fraction of the reuse water we produce.
1.09	Please describe the customer classes served by your reuse water utility	UNC, church. UNC is main customers.
1.10	Please provide data on the count of your customers by class	
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Annual basis - just under 1MGD average. 800,000 gallons a day. Most of it is university. It is higher in the summer when HVAC is full blast. Capacity is for 3 MGD and peak use from university was around 2 MGD. Ability to switch to potable water, and have done so occasionally, but we do not need to supplement with potable water.
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	UNC uses for cooling water
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	No near term plans to expand/add more customers. There have been some new developments that have approached us, but far enough from the plant that it did not make economic sense. University has some plans to expand. But nothing significant. But not really.
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	There are additional reporting requirements. Both for us and the university, information about how much water is used and where.
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Source of supply: 3 reservoirs, 2 small and one that is the main one. Our largest reservoir is about 3 billion gallons. It's still an active rock quarry. In 2030 they have to cease mine operations, and they will join with another quarry, so large storage. Between 2030-2035 after mining stops before the pool fills that we are somewhat at risk from a water supply standpoint. No need to expand water supply. Even through the reclaimed system.
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	We can expand our capacity inexpensively from 3 to 5MGD but nothing in our forecast to do that.
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Utility owns
1.19	Are customers required to connect to your reuse facilities when service is available?	No

Orange Water and Sewer Authority, FL

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>University pays for all operations, but in the rate structure, it is an ongoing contribution to the Capital Improvements fund. We have maybe spent \$500,000 since it's gone into effect. We don't have any big project programmed into our near term CIP, but the university is responsible for making those improvements.</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>It's an additional water supply source. Reduces pressure to expand source water and water treatment plant expansion.</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>The public just does not think very much about it. To the extend we have had communications or gotten feedback, most view it as a good thing if asked. I don't think many understand how it works. A handful of people we heard from over the years who made the assertion that you build capacity into a plant based on university use, so it's put pressure on rates because University now using less water. But when you factor in the source water, treatment plant capacity, it's quite clearly a community benefit.</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>University paid for it</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p>No</p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>Too small to have an effect</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>Cost of service based</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> • Establishing a market – getting/retaining reuse customers • Keeping reuse investment from burdening other customers • Recovering the full capital and/or operating cost of reuse • Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure • Reflecting the benefits derived from the reuse program • Other (specify) _____ 	<p>Cost of service analysis</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> • Overcoming retrofit costs borne by NPR customers • Overcoming perceptions of lesser quality for reuse water • Pressure to price reuse water below the price of potable water • Cost recovery: recovering the full capital and operating costs of providing reuse water • Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools • Other (specify) _____ 	<p>None</p>

Orange Water and Sewer Authority, FL

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>We charge a monthly fixed service charge of \$24,000 a month. They pay 66 cents per thousand gallons for whatever they use. Annual revenue is about \$500,000. Gross OWASA revenues are \$37M. The rates we charge the church are different, the monthly service fee is \$25 or less, and the per gallon is \$2.18 per thousand. For retail - we have block rates. The university pays a seasonal basis rate for potable water. \$8 per thousand in peak month and \$4-5 per thousand during the lower demand months in the winter.</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>Yes</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Yes, metered consumption.</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>Yes, not tiered</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>We have a contract with the university. The fixed charge is meant to cover some operating expenses, variable is for others. No minimum other than the monthly \$24,000.</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	
<p>3.07 Do you currently use seasonal rates?</p>	
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>Yes</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>Church paid some sort of tap fee/buy in. They do charge reuse system development fees. The church paid it.</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>All based on cost of service. In both cases, analysis of what it costs, that was the basis for the rates.</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>Yes, rates are adequate.</p>

Peoria, AZ

Section 1: Reuse Water Utility Characterization

- 1.01 Name and title of utility professional being interviewed
- 1.02 Name and address of agency
- 1.03 Location served
- 1.04 Organization and superior or subordinate units
- 1.05 Please describe the utility services that your agency provides
- 1.06 What is the nature of your reuse service
- 1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.
- 1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.
- 1.09 Please describe the customer classes served by your reuse water utility
- 1.10 Please provide data on the count of your customers by class
- 1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class
- 1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area
- 1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?
- 1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?
- 1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?
- 1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?
- 1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.
- 1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?
- 1.19 Are customers required to connect to your reuse facilities when service is available?

Howell Lindsay, Budget Coordinator
City of Peoria, AZ 8401 W. Monroe St., Peoria, AZ 85345
Peoria Arizona
Delivery of treated effluent for irrigation reuse.
Metered, rate/1000 gal usage; same rate applies throughout the City.
Distribution network does not cover entire municipal service area. Current service areas are limited to areas in the vicinity of two WRFs in the northern and southern areas of the City.
The largest customer is a master-planned development with two golf courses as the largest user. Within that development we also serve schools, park and HOA turf areas for irrigation. Southern service area also serves a City park and municipal landscape irrigation.
Commercial, Public Institutions (city acct), HOAs, Education.
City accounts 9, HOAs 7, education 1
Commercial 0.834 MG, City accounts 63.24 MG, HOAs 429.1MG, education 6.95 MG
Other cities? There are industrial contracts for cooling nuclear power plant in the general area. None other than irrigation in our City or in neighboring cities.
We anticipate expanding the distribution system to make it available to a broader cross-section of customers. The primary driver would be to conserve potable water use as potential sources are restricted. The primary determination of this expansion, however, will be the availability of funding.
We have some permitting and environmental regulations that limit the applicability of reuse water to JUST irrigation.
We have two sources of surface water in addition to groundwater supplies. One of the two surface sources is likely to be restricted in the next 3-5 years. We do have adequate supplies for growth.
Costs for delivery of one of the surface water supplies may increase by as much as 30%, necessitating increases to potable rates.
1,150 miles of water mains and 41.2 million gallons of storage
Water Services Department (City water provider).
No, currently it is optional. Certain developments planned have requirements to utilize reuse for irrigation in their development agreements.

Peoria, AZ

Section 2: Key Reuse and Reuse Rate Drivers

<p>2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?</p>	<p>Large demand needed that we did not want to devote potable resources to supplying. Second, the availability of the treated effluent. Third, desire to conserve potable resources.</p>
<p>2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?</p>	<p>Aligned with both, but more closely with water operations organizationally and from the customer's view. Wastewater operations produce the treated effluent, thus the costs involved in this process are directly & technically linked.</p>
<p>2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.</p>	<p>Don't really understand where it comes from and the benefits of utilizing more broadly, nor do they understand the additional costs in providing. HOA groups that may have access to the source have been slow to commit investment to connect to system (despite savings vs. potable irrigation rates).</p>
<p>2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?</p>	<p>Funded with water operating funds. Do not have a reuse impact fee.</p>
<p>2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?</p>	<p>Reuse has limited potable water growth that would have occurred without this commodity.</p>
<p>2.06 Has the reuse utility impacted the revenue stability of your potable water utility?</p>	<p>Not significantly.</p>
<p>2.07 At a high level, how would you describe your current reuse pricing approach?</p>	<p>Mostly based on direct production cost inputs. We may consider pricing as a percentage of landscape irrigation rate to simplify analysis and to incentivize broader use.</p>
<p>2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:</p> <ul style="list-style-type: none"> • Establishing a market – getting/retaining reuse customers • Keeping reuse investment from burdening other customers • Recovering the full capital and/or operating cost of reuse • Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure • Reflecting the benefits derived from the reuse program • Other (specify) _____ 	<p>Somewhat - initial pricing model was VERY simple. As we expanded system, we included more inputs to better reflect costs of service.</p> <p>Initially we had a large customer in-place upon completion of the master-planned development. Developer paid/installed most infrastructure; water-funded infra was completed as funds available to us. We've balanced full cost recovery with pricing that would be acceptable to customers.</p> <p>We've balanced full cost recovery with pricing that would be acceptable to customers.</p>
<p>2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:</p> <ul style="list-style-type: none"> • Overcoming retrofit costs borne by NPR customers • Overcoming perceptions of lesser quality for reuse water • Pressure to price reuse water below the price of potable water • Cost recovery: recovering the full capital and operating costs of providing reuse water <p>• Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools</p> <ul style="list-style-type: none"> • Other (specify) _____ 	<p>This will be an issue if we expand system in Ciy. Don't think this is an issue for irrigation purposes. We expect to do this to incentivize its acceptance. We can't currently expect to recover full capital/infrastructure investment; some subsidy from potable ratepayers as a result. If I understand question, yes we are aware that it's difficult to balance the apparent competing interests of these (or to align them effectively).</p>

Peoria, AZ

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>No - standard rates for ALL customer classes regardless of volume.</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>Yes - base monthly meter charges increasing by size (duplicates those charged for potable water meters).</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Yes.</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>Yes, but not tiered; applied to entire volume.</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>No.</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	<p>There are variances in costs with some of our customers based on these factors. We elected to price consistently without regard to these.</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>No.</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>No.</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>Yes with the approval of a permit.</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	<p>City accounts \$133,512, HOAs \$571,489, Education \$10,392 for CY2018</p>
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>Primarily based on the costs of production and delivery.</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	<p>We are assuming 25% of our wastewater plant production costs are allocable to reuse production.</p>
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	<p>We are not currently distributing costs to classes customers.</p>
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>Rough idea that we are not capturing ALL related costs; many of the costs in providing (infrastructure & maintenance) are also recovered in our potable water pricing structure.</p>

Plum Creek Water Reclamation Authority, CO

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Lissa Oelkers, Director of Admin Services; Wes Martin, Authority Manager
1.02	Name and address of agency	Plum Creek Water Reclamation Authority, 4255 N. US Highway 85, Castle Rock, CO 80108
1.03	Location served	Town of Castle Rock, other metropolitan districts in Douglas County (Castle Pines Metropolitan District, Castle Pines North Metropolitan District, the Town of Castle Rock)
1.04	Organization and superior or subordinate units	Stand-alone authority
1.05	Please describe the utility services that your agency provides	1986 Castle Pines Metro District WWTF (CPMD) - needed water for golf course - developed system before Authority was formed; Castle Pines North (CPN) and Town of Castle Rock (TCR) participated; reuse program for golf courses; supplied to golf courses at cost; early 2000s added Ridge Golf Course - CPNMD - no agreement, but reuse supplied - CPNMD can charge Ridge whatever they like; wastewater, reuse
1.06	What is the nature of your reuse service	Reclaimed wastewater effluent
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	served within district - golf courses all located within (TCR, CPN, CPMD)
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Three golf courses - can pull as much reuse water as they like, no limits to irrigation - changed in 2017 as TCR intends to recapture discharges up to their water rights; starting to affect golf courses ability to use water; public perception factors into end users
1.09	Please describe the customer classes served by your reuse water utility	Golf courses
1.10	Please provide data on the count of your customers by class	3; one additional golf course to be added this year; TCR tried to add parks and open space but had infrastructure issues and other restrictions; need for reuse due to growth and use of groundwater
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	Varies on weather; each golf course could use up to 1 MGD; 2017 = 165 MG; 2016 = 147 MG; 2015 = 145 MG
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	N/A
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Town of Castle Rock intends to use effluent for ASR; indirect and direct potable uses; Committees and work groups are forming - many people opposed to direct potable reuse (livestock issue); public education with produce and beverages produced with direct potable reuse - negative perception - pumpkins grown with reuse water confiscated!
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	Yes
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Wells - seeing a significant decrease in production and quality; supply not sufficient to meet future water demands; looking at indirect potable; projects in place for surface water; planning for future water demand is in place; available sources are indirect potable and participating share in WISE project; expensive, not readily available
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	New supplies more expensive (WISE)
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	Onsite reservoir - 33 MG storage on PCWRA property and distribution; 8 miles of pipe to golf course ponds, including future use to TCR; rest of irrigation system is owned by users (three members)
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	Small components will be shared with TCR (design & construction) and built by PCWRA - TCR responsible
1.19	Are customers required to connect to your reuse facilities when service is available?	At this time, members are not required to connect

Plum Creek Water Reclamation Authority, CO

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?
- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Whole system had been developed by Metro District in 1986 before Authority was formed; recognized irrigation future would need reuse water
Aligned with wastewater on all counts; TCR is looking at reuse to be more aligned with water
Negative perception in spite of communications; golf courses complain about quality, overwatering evergreens, want an R/O system installed by PCWRA; requirements from Colorado Dept of Public Health and Environment (CDPHE) make reuse less feasible
The reuse infrastructure was funded by an IGA with CPMD & TCR initially prior to the formation of the Authority; PCWRA does not have impact fee, however the members might
Each member has potable water utility; use is only for golf course irrigation so impact on potable water use is not likely to be significant
N/A
COS-based
Unknown how pricing was developed at the beginning back in 1986; in 2001 a COS model was developed with board input based on capital and operating costs
No; PCWRA has gathered data from other reuse providers to compare rates/values
Yes
Yes
No; PCWRA supplies wholesale rates; members may upcharge a retail cost to its customers
No
Historically users have complained of expensive reuse water and asking for advanced water treatment options
No
Yes
Yes
Yes
No
Customers feel they are paying too much, worried about quality of product; review costs annually to see how PCWRA price compares to others (Aurora - considering pricing reuse at potable water rates)

Plum Creek Water Reclamation Authority, CO

Section 3: Detailed Reuse Water Rate Structure Characterization

- 3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?
- 3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?
- 3.03 Is reuse water consumption metered?
- 3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?
- 3.05 Does your rate structure have a take or pay provision for any customers?
- 3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?
- 3.07 Do you currently use seasonal rates?
- 3.08 Do you currently have different rates for customers in different locations or zones?
- 3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?
- 3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.
- 3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?
- 3.12 How did you allocate costs between water/sewer/and reuse water services?
- 3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?
- 3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?

Customer-specific rates based on usage and cost shares of facilities used
No
Yes - required by the State
Yes, uniform rate per unit
No; most costs are jointly shared based on proportion of total usage; however, pump usage will differ and customers pick up their share of specific costs
Yes - pump station (electrical costs)
No
No
No; member communities require facilities requested to be paid for by customer
PCWRA; 2017 = \$276,830; 2016= \$276,894; 2015 = \$233,016
COS
Sewer and reuse cost allocations - PCWRA review and assignment of assets and/or share of operating costs for reuse
Based proportionate use of system and use of pumping facilities
COS-based so full costs of service; usage is relatively stable so revenue is projected to be fairly stable

San Antonio, TX

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	1.01 - Pablo Martinez, Planner III
1.02	Name and address of agency	1.02 - San Antonio Water System (SAWS), 2800 U.S. Hwy 281 North, San Antonio, Texas 78212
1.03	Location served	1.03 - SAWS service area within Bexar County
1.04	Organization and superior or subordinate units	1.04 - Public Water Utility under City of San Antonio municipal government
1.05	Please describe the utility services that your agency provides	1.05 - Potable water, sewer and recycled water services
1.06	What is the nature of your reuse service	1.06 - Provide non-potable water service to commercial, industrial, and environmental flows in rivers and streams
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	1.07 - SAWS service area includes the majority of Bexar County
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	1.08 - Recycled Water users are generally described as: irrigation, cooling tower, industrial and environmental flows
1.09	Please describe the customer classes served by your reuse water utility	1.09 - Irrigation, cooling tower, industrial and environmental flows
1.10	Please provide data on the count of your customers by class	1.10 - Irrigation customers = 64, cooling towers = 9, industrial = 2, environmental flows (river stream releases) = 3
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	1.11 - RW Irrigation = 9,464.83 AFY, RW Cooling Tower = 2,867.51 AFY, RW Industrial = 18 AFY, Environmental = 5,823 AFY (please note these are contracted volumes). Potable water use (2017 data) by customer class is residential = 112,588 AF, multifamily (apartments) = 30,642 AF, commercial = 50,946 AF, industrial = 7,270 AF, reuse = 11,633 AF
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	1.12 - Cooling tower, industrial (i.e. dust suppression, auto paint, etc.), environmental flow is river and streams
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	1.13 - The change noticed over the last 5 years and most likely will be in the future is smaller volumes requested, we see in-fill development so no expansions of system are anticipated at this time
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	1.14 - SAWS has 6,000 miles of potable water mains and 130 miles of recycled water mains plus adequate potable water supplies, the request to use recycled water is location driven
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	1.15 - SAWS' potable supply is 3% surface water and 97% ground water, recycled water is also available. SAWS potable water supply is sufficient up to the year 2070
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	1.16 - Recycled water cost = \$440 AF, potable commercial = \$844 AF, potable irrigation = \$2,421 AF (2018 rates)
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	1.17 - RW miles = 130 miles, ground storage tanks capacity ranges from 1 to 2.8 million gallons
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	1.18 - SAWS has built the majority of the 130 miles and individual customers have built some extensions, regardless of who builds the lines they become public mains
1.19	Are customers required to connect to your reuse facilities when service is available?	1.19 - No, connection and use is volunteer

San Antonio, TX

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

2.01 - In the late 1990s recycled water was considered a short term supply readily available and could be implemented locally, the system has been in operations approximately 20 years
2.02 - Recycled water is considered a third water source, it is treated wastewater therefore it has beneficial use however it is non-potable so it is restricted in use
2.03 - In the two decades that recycled water has been in use, the consistent water quality and low cost make it an attractive water source, the downside is recycled water is not available in all areas of the city. In the early days of the program SAWS employed the service of Public relations firms to help with public education, awareness and acceptance, today recycled water is generally accepted unfortunately not available everywhere
2.04 - Capital dollars and water supply fee dollars were used to construct the initial system, no impact fees
2.05 - In 2017 SAWS' total water use was 213,079 AF for all classes, recycled water was 5% of this total water use so the impact is more economic benefit
2.06 - The recycled water supply availability likewise has made available a similar volume of potable supply.
2.07 - Reuse pricing is not a true cost of service but considers subsidy plus potable water saved by use of recycled water allows more potable water in the water supply available at the higher rates
2.08 - The development cost of an acre-foot of recycled water was \$418 and acre-foot however potable prices at that time were less than \$300 an acre-foot for potable water Initial rates were same as potable, recycled water was not subject to cutbacks during droughts so this
2.09 - Pricing concerns Retrofit costs borne by NPR customers were given a credit on their bill. There are few concerns that NPR is lesser in quality. There is not much pressure to price recycled water below potable but strive to cost recovery.

San Antonio, TX

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>3.01 - Rates for customer class, the SAWS recycled water rates only recognize customers that exchanged permitted ground water (exchange customers) and those customers who did not exchange permitted ground water (non-exchange) customers.</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>3.02 - Fees and other charges - there are no impact or connection fees for recycled water other than the monthly meter charge.</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>3.03 - Recycled water meters are read monthly</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>3.04 - The rate is based upon the first 748,000 gallons and over plus there is a seasonal and non-seasonal rate which varies by cents so the average cost is \$1.34 per 1000 gallons</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>3.05 - In 2014 SAWS started implementing take or pay rate structure</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	<p>3.06 - There are two (2) rates, a "exchange" rate and "non-exchange rate", the exchange rate is a customer who traded over permitted ground water which is in SAWS inventory, these customers pay a rate at approximately \$80 an acre-foot compared to \$440 and acre-foot for non-exchange customers</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>3.07 - Yes</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>3.08 - No</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>3.09 - Customers pay for the connection which cost approximately \$50,000 to tap a concrete lined steel cylinder pipe, SAWS provides the meter to the customer, there are no connection fees</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	<p>3.10 - In 2017 recycled water revenues were \$5.6 million dollars 2016 - \$5,690,846, and 2015 - \$5,097,050</p>
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>3.11 - Rate structure is based on cost of services current and future</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	<p>3.12 - Cost allocation breakdown for the all water rates are as follows: 55% of increase goes to water delivery, 21% goes to water supply and 24% goes to wastewater service</p>
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>3.14 - Approximately half the cost of commercial potable water, 1 acre-foot of RW = \$437 (2018), 1 acre-foot of potable commercial water = \$844, 1 acre-foot of potable irrigation water = 2,421 (2018)</p>

San Diego, CA

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Lee Ann Jones-Santos, Finance Director
1.02 Name and address of agency	9192 Topaz Way San Diego, CA 92123
1.03 Location served	
1.04 Organization and superior or subordinate units	City
1.05 Please describe the utility services that your agency provides	Water, sewer, recycled. Water within the City, sewer - joint agreement with other agencies for wastewater service.
1.06 What is the nature of your reuse service	City of San Diego and 3 additional contracts: OTY, Olivenhein Municipal and the City of Palme?! And one more. 3 additional agencies. Non-potable recycled water.
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	\$420 million on 2 water reclamation plants. \$25M covered by state and federal grants.
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Mostly commercial, Irrigation, dust control and use in cooling towers. irrigation. We do have a program manager in charge of the recycled water system.
1.09 Please describe the customer classes served by your reuse water utility	No in terms of rate structure. One recycled water rate for all customers.
1.10 Please provide data on the count of your customers by class	728 customers retail, 5 wholesale (3 agencies and 2 wholesale)
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	7483 square feet - recycled water 2018. Since 1997, recycled water produced by the City. Suitable for irrigation, industrial and non-potable
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	Industry, cooling towers. 3 other utilities pass it on to their customers. Office building fixtures (toilet, urinal flushing), dust suppression, construction
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	We have had program for quite a long time. How it changes? We are doing the pure water program, we will have to evaluate. Right now we are doing in field customers, that can connect to existing system, we will have to evaluate for future if not on system. Pure water program - taking wastewater and creating a potable water source. Key is by the time we complete, it will provide us 1/3 of our water supply, decrease offload from one of our treatment plants. Approval for construction contract, working with regulators for many years. We need to do phase 1. We do not plan to stop recycled program, but future expansion will have to be evaluated.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	None that she knows. There is a difference in cost. If you are a golf course, and you can connect to the recycled water program.
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Supply - purchase from San Diego County Water Authority, Colorado River, Bay delta. And local water. What we purchase - 85-90% per year. As that becomes more expensive, some additional local supply that we are in charge of will help. Pure water program.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	3300 miles of water pipe, service area 404 square miles for the water system.325 sq. miles for the City. 1.4 million population served. Not sure on recycled system.
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	It depended on the time when we did it. Defer to program manager.
1.19 Are customers required to connect to your reuse facilities when service is available?	

San Diego, CA

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01 What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02 Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03 How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04 How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05 How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06 Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07 At a high level, how would you describe your current reuse pricing approach?

- 2.08 Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
 - Establishing a market – getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09 Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
 - Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Don't know if I can comment on that. to conserve the potable water. Will ask program manager.
Currently, people are happy to have it as a source of water
We received incentives from MWD (Metropolitan Water District). We also had some grant funding. She will confirm if they charge an impact fee.
Defer to program manager. It is a small component of our overall water supply, but it is important.
It is a small component of the total budget.
Pending litigation. In 2015 the city council with prop 2018 approved 5 year rates - FY16-FY20. Recycled rates approve to rise to \$1.73 per HCF starting Jan 1 2016. It will be reevaluated again with our next COS.

St. Petersburg, FL

Section 1: Reuse Water Utility Characterization

1.01	Name and title of utility professional being interviewed	Mr. Claude Tankersley, P.E.	Public Works Administrator
1.02	Name and address of agency	City of St. Petersburg P.O. Box 2842 St. Petersburg, FL 33731-2842	
1.03	Location served	St. Petersburg, FL area.	
1.04	Organization and superior or subordinate units	City of St. Petersburg, FL > Public Works Administration > Water Resources Department / Stormwater, Pavement, and Traffic Operations Department / Engineering & Capital Improvements Department / Fleet Management Department	
1.05	Please describe the utility services that your agency provides	The City supplies retail water to its residents and those of the City of South Pasadena, as well as the unincorporated areas of Bear Creek, Lealman, Gandy Boulevard, Seminole, Bay Pines in Pinellas County, and certain customers previously unincorporated but currently annexed by other municipalities. The City supplies wholesale water to the City of Gulfport. The City supplies retail wastewater service to its residents and certain areas of unincorporated Pinellas County. The City supplies wholesale wastewater service to the Cities of South Pasadena, Gulfport, St. Pete Beach, and Treasure Island, and to the Bear Creek Sanitary District, Fort DeSoto Park, and Tierra Verde Utilities, Inc. The City provides reclaimed water as an alternative to potable water. More than 12,000 customers use this source for irrigating lawns and landscapes. Some non-residential customers also use reclaimed water for industrial purposes such as in cooling systems.	
1.06	What is the nature of your reuse service	The City has approximately 12,000 reclaimed water customers that use an average of 18.35 MGD of recycled water to irrigate more than 8,149 acres of turf grass and landscape material. Single-family residential irrigation comprises the largest irrigation areas by type within the City. The system also supports a number of air conditioning cooling towers and provides increased fire protection with 305 fire hydrants to supplement the existing emergency services. Today, the City's reclaimed water product is discharged to the City's public access reclaimed water distribution system. Excess reclaimed water is discharged to Class 1 Injection Wells.	
1.07	Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	Reclaimed water is provided only within the City and to a limited customer base of approximately 11,100 customers. For comparative purposes, of as May 2018, the Water Resources Department had approximately 93,500 water service accounts and 82,400 wastewater service accounts. See answer provided to survey question 1.05 for a description of areas served by the City.	
1.08	Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	The City has approximately 12,000 reclaimed water customers that use an average of 18.35 MGD of recycled water to irrigate more than 8,149 acres of turf grass and landscape material. Single-family residential irrigation comprises the largest irrigation areas by type within the City. The system also supports a number of air conditioning cooling towers and provides increased fire protection with 305 fire hydrants to supplement the existing emergency services.	
1.09	Please describe the customer classes served by your reuse water utility	Residential, Commercial, and Governmental. From a rates perspective, Unmetered Service and Metered Service.	
1.10	Please provide data on the count of your customers by class	Residential 11,603, Commercial 389, Govt. 120 of Total 12,112	
1.11	Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	2 customers: largest UNC - went online in early 2009, reason we got into it, we partnered with the university (some entity mandated that state organizations reduce their potable water use), Impetus for university to partner. University paid for construction of the facility They reduced their potable water use by 25%. they use it for irrigation around the campus, sports fields, flushing in some of the newer buildings. primary use is in the water cooling towers for HVAC. Second customer is a large church campus that is along the pipeline, very easy for them to plug in. Church is mostly for irrigation, an addition on their facility to flush toilets. They use a fraction of the reuse water we produce.	
1.12	Please describe any non-irrigation uses of reuse water being utilized in your service area	The system also supports a number of air conditioning cooling towers and provides increased fire protection with 305 fire hydrants to supplement the existing emergency services.	
1.13	Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Not likely. Any customer growth would occur through situational CIP spending.	
1.14	Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	The City's reclaimed water product is discharged to the City's public access reclaimed water distribution system under FDEP Master Permit Number FLA012881. Excess reclaimed water is discharged to Class 1 Injection Wells permitted by FDEP.	
1.15	Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	The City currently purchases its raw water from Tampa Bay Water, a Regional Water Supply Authority. Tampa Bay Water meets the region's drinking water needs with a diverse, flexible supply network, state-of-the-art quality monitoring, and protection of the natural environment. The region's water is blended from three different sources: groundwater, surface water, and desalinated sea water. The water supply to the City is provided by Tampa Bay Water from groundwater well fields located in Hillsborough and Pasco Counties; surface water from the Hillsborough and Alafia rivers; and, a seawater desalination plant located at Apollo Beach, FL. The City is connected to the regional water system at the Cosme Water Treatment Plant through a 42-in main, which connects the South Pasco Well Field to the 84-in main from Cypress Creek Pumping Station.	
1.16	Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	No	
1.17	What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	There are 287 miles of pipe in the City's reclaimed water distribution system. Reclaimed water storage is contained at the three Wastewater Reclamation Facilities and the combined capacity is 25 million gallons. The distribution system is configured in specific runs around schools, parks, golf courses and salt intrusion areas.	
1.18	Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	City of St. Petersburg	
1.19	Are customers required to connect to your reuse facilities when service is available?	No	

St. Petersburg, FL

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market – getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

In 1972, the Wilson-Grizzle Bill was enacted by the Florida Legislature. It required all communities in the Tampa Bay area to cease discharging wastewater into Tampa Bay or to treat their discharge with advanced wastewater treatment technology to reduce nitrogen and phosphorous concentrates. The City evaluated the alternatives of continuing surface water discharge with a high advanced wastewater treatment quality of effluent from its water reclamation facilities or changing to a reclaimed wastewater effluent disposal system. Based on the cost of constructing and operating advanced wastewater treatment nutrient removal facilities, and considering the water supply system's vulnerability, the City opted to upgrade the water reclamation facilities slightly to advanced secondary treatment and implement an effluent recycling and deep well injection program that result in zero-discharge to surface waters.
Both water and wastewater. Reduce potable demands while providing an alternative method of effluent disposal.
The response was overall positive and accepting of the use of reuse water. Utility bill inserts flyers and social media spread awareness and educated citizens of the cost benefits versus potable water and the impact on water conservation. This raised the awareness and understanding of the use of reuse water.
Through Reuse rates but subsidized equally between water and wastewater ratepayers.
Yes. Potable water demands are reduced by the use of reclaimed water for irrigation of turf and other landscape materials.
Yes, from the perspective that the potable water/sewer rates subsidize cost under recovery for reuse water.
Entity decision to subsidize reuse business through water and sewer rates as of now. Significant rate increases above water and sewer increases over the next 6 years to reduce the subsidy.
There was extensive discussion during the development of our utility which is also revisited periodically.
No, other than the current subsidy by water and sewer rate payers.

St. Petersburg, FL

Section 3: Detailed Reuse Water Rate Structure Characterization

<p>3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?</p>	<p>No, does not differ by customer class. Rates are either Metered or Unmetered. Metered service costs \$0.83 per Kgal (\$29.59 minimum); whereas Unmetered service costs a flat monthly fee of \$29.59 for parcels up to 1 acre and \$16.98 per additional acre.</p>
<p>3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?</p>	<p>For unmetered customers , a Flat Monthly Charge with an additional flat charge for additional acreage.</p>
<p>3.03 Is reuse water consumption metered?</p>	<p>Most reuse customers are not currently metered consumption.</p>
<p>3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?</p>	<p>The reclaimed water use is not metered therefore the rate is not tiered and there is a flat rate for all customers which is based on the property size. For properties with one acre or less the current flat rate is \$29.59 with the price going up by \$16.96 for each additional acre. There is only one metered industrial customer that is billed \$0.83 per each 1000 gallons.</p>
<p>3.05 Does your rate structure have a take or pay provision for any customers?</p>	<p>No</p>
<p>3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?</p>	<p>No</p>
<p>3.07 Do you currently use seasonal rates?</p>	<p>No</p>
<p>3.08 Do you currently have different rates for customers in different locations or zones?</p>	<p>No</p>
<p>3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?</p>	<p>Yes. There is a charge for meter installation which is \$620.51 for a one inch service line. The 1.5 and 2 inch connections are done at cost.</p>
<p>3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.</p>	<p>Client needs to provide. Ticket out to DOTs to obtain the data/report.</p>
<p>3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?</p>	<p>Rates set below cost of service/subsidized by water and sewer rates. Attempting to move towards cost based reuse rates with higher percent increases than water rate increases over a six year period.</p>
<p>3.12 How did you allocate costs between water/sewer/and reuse water services?</p>	<p>Typical COS fashion.</p>
<p>3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?</p>	<p>Generally on COS principles and acreage. Reclaimed water use is not metered therefore the rate is not tiered and there is a flat rate for all customers that is based on property size. For properties with 1 acre or less the flat rate is \$29.59 which goes up by \$16.96 for each additional acre.</p>
<p>3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?</p>	<p>Not fully recovering allocated reuse costs as the water and sewer rates. Each subsidize approximately 75% of the cost of shortfall.</p>

Toho Water Authority, FL

Section 1: Reuse Water Utility Characterization

1.01 Name and title of utility professional being interviewed	Mr. Rodney Henderson, Director of Business Services
1.02 Name and address of agency	TOHO Water Authority, 951 M.L.K. Blvd. Kissimmee, FL 34741
1.03 Location served	Greater Kissimmee, FL area
1.04 Organization and superior or subordinate units	Potable Water, Sewer, and Reclaimed Water
1.05 Please describe the utility services that your agency provides	Residential irrigation and Bulk use (Irrigation, Fire Protection, and Electric Generation (Duke Energy))
1.06 What is the nature of your reuse service	
1.07 Please describe the geographic area served by your reuse system. How does the reuse water service area differ from: broader jurisdictional boundaries, and your water and/or sewer service area.	
1.08 Generally describe the end users of your reuse water - large versus small retail, and are there wholesale users? Generally describe the uses to which reuse water is being applied.	Residential Irrigation and Bulk A and Bulk B(Irrigation, Fire Protection, Electric Energy - Duke Energy)
1.09 Please describe the customer classes served by your reuse water utility	See 1.08 above
1.10 Please provide data on the count of your customers by class	14,500 Residential, 3 Bulk A and 4 Bulk B
1.11 Please provide data on the volumetric delivery of reuse water as well as potable water by customer class	FY16 Res. 1,982,502 (TGAL), Bulk A 1,563,355 (TGAL), Bulk B 371,421 (TGAL)
1.12 Please describe any non-irrigation uses of reuse water being utilized in your service area	Fire Protection and Electric Generation
1.13 Describe the change in your customer base that you foresee in the next 5 to 10 years. Is your growth reflecting geographic expansion of the reuse system, economic development, native population growth, or expansion driven by shortages in different sources of water supply? Are there particular customer classes that are growing or shrinking?	Our growth forecast call for a moderate and steady growth rate in the next 5 to 10 years between 2.5% and 4% primarily the result of projected economic development activity.
1.14 Are local, regional, or state restrictions on the use of potable water for irrigation or other uses of water relevant?	None
1.15 Please describe the source of potable water supply used by your community. Is the supply sufficient to meet the anticipated future demands? What other water supply sources are available?	Water facilities currently rely exclusively on ground water derived from the upper Floridan aquifer. The supply is not sufficient to meet the anticipated future demands. Alternative Water Supply project are being evaluated such as ... <ul style="list-style-type: none"> • Use of the brackish portion of the Lower Floridan aquifer near Cypress Lake; (in preliminary design phase) • Upper Kissimmee River water supply and storage; • Indirect aquifer recharge via the Lake Wales Ridge; • Brackish water supply development in east Osceola County; and • Taylor Creek Reservoir (TCR) Surface Water Treatment.
1.16 Are there significant known or projected differences in costs of new supplies relative to existing supplies, and what is the magnitude of these differences?	
1.17 What is the size and general configuration of your distribution system: miles of pipe; storage; area-wide versus specific runs; etc.	122 miles of transmission main and 191 miles of distribution main
1.18 Who is responsible for building the linear assets in your system? Who owns the linear assets in your system?	TOHO Water Authority
1.19 Are customers required to connect to your reuse facilities when service is available?	No

Toho Water Authority, FL

Section 2: Key Reuse and Reuse Rate Drivers

- 2.01** What were the drivers that lead your agency to implement a reuse water utility in the first place? How long has it been?
- 2.02** Does your utility consider reuse to be more closely aligned with wastewater or water? Technically? Organizationally? From a customer viewpoint?
- 2.03** How would you characterize the public's response to the use of reuse water? Include awareness, understanding, and acceptance.
- 2.04** How did you fund the initial capital cost of building your reuse water infrastructure? Do you have reuse impact fees?
- 2.05** How has the availability of reuse water impacted your potable water utility? Has it impacted the total use, peak use, irrigation use, industrial use? How is total (the sum of potable and reuse) water demand different from before reuse water was available?
- 2.06** Has the reuse utility impacted the revenue stability of your potable water utility?
- 2.07** At a high level, how would you describe your current reuse pricing approach?
- 2.08** Did you have extensive reuse pricing discussions during the development of your utility or before the rate structure was established? Did you consider different pricing objectives such as:
- Establishing a market -- getting/retaining reuse customers
 - Keeping reuse investment from burdening other customers
 - Recovering the full capital and/or operating cost of reuse
 - Factoring in the cost of the next best alternative water supply as part of the cost allocation process underpinning the pricing structure
 - Reflecting the benefits derived from the reuse program
 - Other (specify) _____
- 2.09** Do you know of current, ongoing, pricing concerns relative to your reuse rates? For example:
- Overcoming retrofit costs borne by NPR customers
 - Overcoming perceptions of lesser quality for reuse water
 - Pressure to price reuse water below the price of potable water
 - Cost recovery: recovering the full capital and operating costs of providing reuse water
 - Alignment: concerns over the fundamental drivers for reuse versus currently available cost recovery options and pricing tools
 - Other (specify) _____

Reduce potable water demands and additional use of wastewater effluent
Our utility has a past practice of aligning the reuse evenly between wastewater and water.
Public awareness is based on customer class; large commercial and bulk users have a more heightened awareness than retail customers. However, retail customers are more sensitive to watering days and availability to maintain lawns especially in planned communities with HOAs.
Collected through water, sewer, and reclaimed water rates; reclaimed water revenues do not cover full allocated reclaimed costs
Reduced potable water peak demands
Water and sewer rates subsidize reclaimed water rates/allocated costs.
Authority is attempting to reduce over time the subsidy of reclaimed water rates by the water and sewer rates
Yes, our utility took steps to evaluate several factors, including those listed, when it established and subsequently revised our reuse rate structure,

Toho Water Authority, FL

Section 3: Detailed Reuse Water Rate Structure Characterization

3.01 Does your rate structure differ by customer class? Do you have unique customer-specific rates for large customers?	Yes. Bulk A customers have no pumping or storage capabilities while Bulk B customers have pumping and storage capabilities so they have lower rates than Bulk A
3.02 Does your rate structure include any fixed fees, readiness to serve charges, or any other base rate (including a flat monthly charge)?	Yes.
3.03 Is reuse water consumption metered?	Yes
3.04 Does your rate structure include a volumetric rate? If so, is the rate tiered? Do rates differ by customer class?	Yes
3.05 Does your rate structure have a take or pay provision for any customers?	No
3.06 Are there any customer-specific differences in rates to reflect customer provision of their storage, interruptability, proximity to your facilities, or alternate sources of supply?	Yes, see 3.01 above
3.07 Do you currently use seasonal rates?	No
3.08 Do you currently have different rates for customers in different locations or zones?	No
3.09 Do you currently charge meter installation, tap, and/or connection fees for reuse service?	Yes
3.10 Please provide annual fixed and volumetric revenues for each reuse customer class for the last three years.	FY16 Reclaimed Revenue totals \$7.5 M while potable water is \$31.5 M
3.11 What is the basis for the numbers in your current rate structure? Did cost of service drive your existing rate structure? Did you set rates at a percentage of the potable water rate or as a percentage of the marginal cost for the next alternative water source?	Reclaimed rates are set at 60% of potable water irrigation rates
3.12 How did you allocate costs between water/sewer/and reuse water services?	Through a cost allocation study
3.13 How did you distribute reuse costs to different classes of customers or individual contract customers?	Through a cost allocation study
3.14 How adequate are your rates when compared to the full costs of service to provide reuse water? Does your answer reflect what you "just know", or a focus on the incremental costs, or a knowledge of the fully allocated costs of service? How do you cover residual costs?	Based on the last cost allocation study performed, reclaimed rates set at 91% of allocated costs. Reflects a concerted effort to raise the reclaimed from 82% of allocated costs





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