Section 1
Infrastructure Element

1. Introduction

The Unification Charter of the Unified Government of Athens-Clarke County (ACCGov) required a plan for providing water and wastewater services to all residents be developed and adopted by January 1995. In accordance with this requirement, the Athens-Clarke County (ACC) Public Utilities Department (PUD) developed a Service Delivery Plan (SDP) that consisted of three major elements:

- Infrastructure Element, which evaluates the water and wastewater system needs over a 20-year planning period and identifies improvements to address these needs,
- Capital Improvements Element, which prioritizes the recommended improvements, and
- Financial Element, which outlines a schedule and financial plan for implementing the identified improvements.

PUD's goal is to update the SDP on a 5-year cycle, or in response to regulatory drivers or the adoption of updated Future Development Maps by ACC Mayor and Commission (M&C). The 2020 SDP Infrastructure Element was developed using the following phased approach:

1) Review ACC PUD goals and objectives for water and wastewater service, as well as strategies to accomplish these goals (described in Section 1).
2) Assess existing water and wastewater system (described in Section 2).
3) Identify future water and wastewater system needs (described in Section 3) based on:
    - Official Future Development Map of ACC (latest adopted by M&C in July 2018) and associated population projections developed by the ACC Planning Department
    - 2018 Comprehensive Plan (ACCGov, 2018), Envision Athens Action Agenda (ACCGov, 2017), and associated population projections as developed by ACCGov Planning Department
    - Evaluation of existing infrastructure's capability to meet existing and projected future needs
4) Identify system alternatives and improvements to address existing and future needs (described in Section 4).

1.1 Service Delivery Plan Goals and Objectives

The goals of the SDP, as defined by PUD, are to:

- Comply with the Unification Charter that requires ACCGov to adopt a plan to provide water and wastewater services to all residents as defined herein.
- Develop a plan that supports water and wastewater needs, as determined by the ACC Comprehensive Plan (ACCGov, 2018) adopted by M&C and associated fire protection services.
- Provide water and wastewater services to the ACC population using an infrastructure design that will protect or improve water quality, protect public investments including conservation and recreational green spaces, and avoid impacts to environmentally sensitive areas such as wetlands, buffers, and floodplains.
- Plan expansions and extensions of service according to the ACC's Future Development Map, recognizing that infrastructure influences long-term development patterns.
- Support existing Watershed Protection Programs with the intent to maintain or improve water quality standards.

- Align with the Fiscal Year 2021 Mayor and Commission Strategic Commitments and Goals including "improving water supply resiliency and reliability," "aim for 100% clean and renewable energy," and "managing environmentally damaging septic tanks." (ACCGov, 2020)

1.2 Water and Wastewater Service – Definition and Goals

The 1995 Service Delivery Plan included specific definitions of water and wastewater services. These definitions, listed below, have been reviewed and approved by the M&C. This update also defines recycled water service which has not previously been defined.

Water Service is defined as the provision of treated (potable) water supply through ACC-owned, operated, and maintained transmission and distribution lines located outside of developments, along identified major roadways. Additional ACC-owned, operated, and maintained smaller pipelines will be required to connect to service lines to establish customer connections. Service lines are typically funded by the property owner/developer and are not included in the SDP.

PUD's goal is to provide water service to all residents by expanding service in existing areas and new growth areas.

Wastewater Service is defined as the provision of wastewater collection and treatment through sewage treatment facilities, trunk and interceptor lines, and major pump stations and force mains in identified major drainage basins and specified sub-basins. Additional collector and service lines to establish individual customer connections are not included in the SDP. Privately owned individual treatment systems (septic tanks) that meet the ACC Health Department requirements may satisfy the provision for wastewater service planned for low-density development of two units per acre or less.

PUD's initial goal was to provide wastewater service to all residents; however, M&C determined that privately owned individual treatment systems (that is, septic tanks) that meet the ACC Health Department requirements may better serve areas of low-density development. Therefore, PUD's goal for wastewater service is to provide public wastewater collection and treatment to the greatest practicable extent, based on population densities and cost-effectiveness.

Recycled Water Service is defined as the provision of recycled water, treated to an extent appropriate for irrigation, industrial cooling, and other non-drinking purposes, through ACC-owned, operated, and maintained transmission and distribution lines located outside of developments. along major roadways to recycled water customers for beneficial use. Recycled water service provides additional drought resiliency and water supply reliability by reducing potable water demand.

1.3 Strategies to Accomplish Service Goals

To accomplish its **water service goals**, PUD will use the SDP to outline its approach to:

- Install Transmission and Distribution Lines along major roadways, especially in areas not currently served by the distribution system but are planned for growth in the Future Development Map.
- Evaluate the water system based on PUD minimum pressure and velocity operating criteria.
- Evaluate elevated water storage to support future needs, enhance water system operations, and sustain fire protection.
- Provide water service through smaller pipe lines connected to the transmission and distribution lines and eliminate dead-end pipe lines.

- Ensure long-term water quality by meeting future regulatory requirements.
- Improve water supply resiliency and reliability.

To accomplish its **wastewater service goals**, PUD will use the SDP to define a plan to:

- Install trunks, interceptors, and major pump stations/force mains within the M&C approved public service area.
- Provide wastewater service through Collector Lines to approximately 90 percent of ACC residents (approximately 10 percent of residents, located in rural land use areas, may be better served by onsite systems based on population density and cost effectiveness).
- Improve the existing system by expanding pipes, if predicted flows are greater than 75 percent of the pipe's capacity.
- Provide service to the upper 200 acres of each sub-basin.
- Identify and correct areas of high infiltration and inflow (groundwater and stormwater into the system).
- Maintain the integrity of water reclamation facility (WRF) equipment reliability and redundancy.
- Ensure WRF treatment technology produces effluent meeting or exceeding regulatory requirements.

To accomplish its **recycled water service goals**, PUD will use the SDP to define a plan to:

- Install recycled water Transmission and Distribution Lines along major roadways, especially in areas identified as potential future recycled water customers in the *Reuse System Master Plan*. (CH2M, 2018b)
- Evaluate recycled water system based on PUD minimum pressure and velocity operating criteria.
- Evaluate elevated recycled water storage to support future needs and enhance recycled water system operations.
- Ensure long-term recycled water quality by meeting future regulatory requirements.
- Improve water supply resiliency and reliability by reducing potable water demand.

1.4 Implementation Guidelines

ACC PUD plans, designs, and constructs water and wastewater infrastructure with the goal of being dependable, safe, operationally efficient, and easily maintained. Throughout this process, multiple approvals are required by M&C, including project concept and design development, engineering consultant selection, preliminary construction plans, easement acquisitions, and construction bid award. As such, PUD has developed engineering guidelines/recommended practices for various phases of project implementation. These guidelines, summarized below, build upon experience from past projects and from PUD's commitment to avoiding, minimizing, and mitigating environmental impacts.

1.4.1 Conceptual Planning

PUD utilizes the following guidelines during conceptual planning for water and wastewater improvements:

- The SDP provides for flexibility to deliver wastewater service. Gravity sewers are preferred as the long-term, most cost-effective design option for wastewater systems. Alternative designs (including pump stations and force mains) may be considered to avoid environmentally sensitive areas or other constraints on a project-by-project basis.
- Design options for water and wastewater service will be evaluated during the preliminary engineering design phase. The results of this evaluation will be subsequently presented to M&C for approval.

- Pump stations, cluster septic systems, or other decentralized wastewater treatment systems may be considered as a service solution in areas where public wastewater is not available and existing developments are currently experiencing or are expected to experience septic system failures. For communities with failing septic systems, ACC PUD will develop a specific method of providing wastewater service to the subject area, though property owners are responsible for funding their connection to the wastewater system, through collector or service lines.

1.4.2 Preliminary Engineering Design

PUD utilizes the following guidelines during the preliminary engineering design phase for water, wastewater, and recycled water improvements:

- Design infrastructure improvements in such a way as to avoid or minimize impacts to environmentally sensitive areas, public investments such as land conservation or recreational green spaces, and to protect the overall water quality. Proposed routes will be surveyed under the guidance of an ecologist or other environmental professional to identify these sensitive areas.
- Review pump station and force main design options that may apply to the project.
- Review alternative construction strategies and technologies to minimize areas of impact.
- Obtain necessary temporary construction and permanent easements for the project.
- Conduct a Public Outreach Program to solicit input from impacted property owners and the community.
- Conduct coordination meetings with ACCGov departments, the University of Georgia (UGA), and other appropriate agencies.
- Develop an estimated project cost for the project.

1.4.3 Final Engineering Design

PUD utilizes the following guidelines during the final engineering design phase for water, wastewater, and recycled water improvements:

- Continue the coordination of design activities with ACCGov departments, UGA, and other appropriate agencies.
- Stream crossing design goals are to:
  - Evaluate the potential to relocate aerial crossing to below the streambed.
  - Minimize impact area by using appropriate construction strategies and technologies.
  - Restore streambanks to a condition that is equal or superior to the previous conditions prior to construction.
  - Purchase any required mitigation credits.
- Wetland encroachment goals are to:
  - Minimize the impact area through the evaluation and implementation of appropriate construction strategies and technologies.
  - Purchase any required mitigation credits.
- Land disturbance goals are to:
  - Minimize impact area by limiting the constructed width and length of open trenches and other excavations.

- Comply with permits for erosion, sedimentation, and pollution control in compliance with permit requirements.

1.4.4 Design Resources

PUD has adopted the following documents for reference during the design of water, wastewater, and recycled water improvements:

- *Standard Specifications for Wastewater and Water System Construction* (ACC PUD, 2008). Standard specifications and detail drawings have been prepared by PUD to provide qualitative requirements for products, materials, and workmanship for construction of additions to and replacements of the sewer system and water distribution system under the jurisdiction of ACCGov. The latest edition of this document is available from the PUD website.
- *Sanitary Sewer Renewal Design Guidelines* (ACC PUD, 2018). Design Guidelines serve as the guiding principles for the design of sanitary sewer renewal projects associated with the wastewater collection system owned and operated by PUD. This document is intended to serve as a tool for Design Engineers and supplement to the Standard Specifications for Wastewater System Construction (ACC PUD, 2008). The guidelines outline the various methods, technologies, and materials of rehabilitation and replacement approved by PUD for renewal projects.
- *Standard Specifications for Recycled Water System Construction* (ACC PUD, 2019). Standard specifications and detail drawings have been prepared by PUD to provide qualitative requirements for products, materials, and workmanship for construction of additions to and replacements of the recycled water system under the jurisdiction of ACCGov. The latest edition of this document is available from the PUD website.

1.4.5 Construction

During the construction phase, PUD not only meets permit requirements, but also places more stringent limitations on the contractor (for example, restrictions of no more than 1,000 feet of simultaneous construction disturbance and a construction width of no more than 50 feet). Project construction is coordinated with other government agencies to minimize the impact of construction. PUD complies with the ACC Community Tree Management Ordinance (ACCGov Code Title 8, Chapter 8-7) and completes additional riparian restoration efforts, including grassing and tree planting where temporary construction easement encroaches on protected buffers.