Charlotte County
Potable Water Master Plan

Charlotte County Utilities Department | 2023

JonesEdmunds

CHARLOTTE COUNTY
FLORIDA

CHARLOTTE COUNTY
POTABLE WATER MASTER PLAN

Prepared for:

Charlotte County Utilities

25550 Harbor View Road

Port Charlotte, Florida 33980

Prepared by:

Jones Edmunds & Associates, Inc.

7230 Kyle Court

Sarasota, Florida 34240

Jones Edmunds Project No.: 03405-041-01

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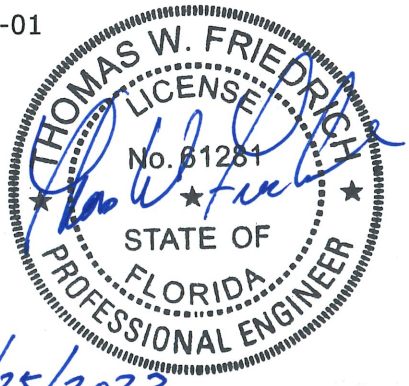

04/25/2023

Thomas W. Friedrich, PE, BCEE
Florida PE No.: 61281

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LIST OF ACRONYMS AND ABBREVIATIONS

AADD	Annual Average Daily Demand
AADF	Annual Average Daily Flow
AC	Asbestos-Cement
AMI	Advanced Meter Infrastructure
ARPA	American Rescue Plan Act of 2021
ASR	Aquifer Storage and Recovery
AWS	Alternative Water Supply
AWTF	Advanced Water Treatment Facility
AWWA	American Water Works Association
BAT	Biologically Active Filtration
BCC	Board of County Commissioners
BEBR	Bureau of Economic and Business Research
BG	Billion Gallons
bls	Below Land Surface
BMP	Best Management Practice
CCCP	Cross-Connection Control and Backflow Prevention (Program)
CCPWMP	Charlotte County Potable Water Master Plan
CCU	Charlotte County Utilities Department
CDC	Centers for Disease Control
CDD	Charlotte County Community Development Department
CFI	Cooperative Funding Initiative
CFP	Cooperative Funding Program
CFR	Code of Federal Regulations
CHEC	Charlotte Harbor Environmental Center
CHWA	Charlotte Harbor Water Association
CIP	Capital Improvement Project
CMMS	Computerized Maintenance Management System
CMP	Capital Maintenance Program
CO_2	Carbon Dioxide
CWSRF	Clean Water State Revolving Fund
DBP	Disinfectant and Disinfection Byproduct
DEO	Florida Department of Economic Opportunity
DMR	Discharge Monitoring Report
DPR	Direct Potable Reuse
DU	Dwelling Unit
DWSRF	Drinking Water State Revolving Fund
EPA	US Environmental Protection Agency

EPS	Extended-Period Simulation
ERC	Equivalent Residential Connection
EWD	Englewood Water District
FAC	Florida Administrative Code
FBC	Florida Building Code
FDEM	Florida Division of Emergency Management
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FFD	Fire Flow Demand
FFPC	Florida Fire Prevention Code
FGUA	Florida Governmental Utility Authority
FPRC	Florida Potable Reuse Commission
FPSC	Florida Public Service Commission
FS	Florida Statutes
FY	Fiscal Year
GDC	General Development Corporation
GDU	General Development Utilities
GIS	Geographic Information System
GIWA	Gasparilla Island Water Association
gpcd	Gallons per Capita Day
gpd	Gallons per Day
gpm	Gallons per Minute
GSAPF	Geospatial Small-Area Population Forecasting
GST	Ground Storage Tank
H_2S	Hydrogen Sulfide
HAA	Haloacetic Acids
HMGP	Hazard Mitigation Grant Program
HSP	High-Service Pump
HSPS	High-Service Pump Station
I	Interstate
IPR	Indirect Potable Reuse
LCR	Lead and Copper Rule
LF	Linear Foot
LOS	Level of Service
LSL	Lead Service Line
MCC	Motor Control Center
MCL	Maximum Contaminant Level
MCLG	MCL goal
MDD	Maximum Daily Demand
MDF	Maximum Daily Flow
MFL	Minimum Flow Level

MG	Million Gallons
MGD	Million gallons per day
MHP	Mobile Home Park
MinWD	Minimum Weekly Demand
MOR	Monthly Operating Report
MSBU	Municipal Service Benefit Unit
MSTU	Municipal Services Taxing Unit
MWSC	Master Water Supply Contract
NaOCl	Sodium Hypochlorite
NELAP	National Environmental Laboratory Accreditation Program
NF	Nano-Filtration
NFPA	National Fire Protection Agency
NRI	Non-Residential Indoor
O&M	Operation and Maintenance
OFWUP	Operational Flexibility Water Use Permit
OSTDS	On-Site Sewage Treatment and Disposal System
PDM	Pre-Disaster Mitigation
PFAS	Per- and Polyfluoroalkyl Substances
PHD	Peak Hourly Demand
PMD	Peak Monthly Demand
PMF	Peak Monthly Flow
POE	Point of Entry
PPH	People Per Household
PRMRWSA	Peace River Manasota Regional Water Supply Authority
PRMRWTF	Peace River Manasota Regional Water Treatment Facility
PSA	Public Service Announcement
PSAR	Public Supply Annual Report
psi	Pounds Per Square Inch
PWS	Public Water System
R&R	Rehabilitation and Replacement
RAO	Rural Area of Opportunity
REDI	Rural Economic Development Initiative
RO WTP	Reverse Osmosis Water Treatment Plant
RTS	Regional Transmission System
SAT	Soil Aquifer Treatment
SCADA	Supervisory Control and Data Acquisition
SF	Square Footage
SFWMD	South Florida Water Management District
SO	Service Order
SOC	Synthetic organic chemical
SOP	Standard Operating Procedure

SWAG	State Water Quality Assistance Grant
SWFWMD	Southwest Florida Water Management District
SWUCA	Southern Water Use Caution Area
THM	Trihalomethane
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
TTHM	Total Trihalomethanes
UIC	Underground Injection Control
USGS	US Geological Survey
UV-AOP	Ultraviolet-Advanced Oxidation Process
VFD	Variable-Frequency Drive
VOC	Volatile Organic Chemical
WBS	Water Booster Station
WC	Water Conservation
WCP	Water Conservation Plan
WIFIA	Water Infrastructure Finance and Innovation Act
WRF	Water Reclamation Facility
WSFWP	Water Supply Facility Work Plan
WUP	Water Use Permit
µg/L	Micrograms Per Liter

1. INTRODUCTION

OVERVIEW

Chapter 1 defines the purpose and objectives of Charlotte County's Potable Water Master Plan. Creating an affordable, reliable, and efficient water supply, treatment, and distribution system is key to sustainable population growth, economic development, and the health of the County's natural resources and landscape. Population surges and steady growth continue to impact our water supply quantity and quality. This Master Plan is a local and regional collaborative effort to improve and protect the region's water supply in an affordable, sustainable, efficient, and reliable manner.

1.1 PURPOSE

The water quantity and quality in Charlotte County's natural surface and groundwater resources include Charlotte Harbor, the Peace and Myakka Rivers, and the Floridan aquifer, all which have significant impacts on the well-being of the community. A regional effort is currently underway to improve and protect these crucial natural resources that impact ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, our tourism industry, home values, and overall quality of life.

As part of this effort, the Charlotte County Board of County Commissioners (BCC) developed the *One Charlotte One Water* initiative to ensure adequate quantity and sustain the quality of natural water resources in Charlotte County. The *One Charlotte One Water* initiative is a holistic approach considering our harbor, rivers, bays, canals, creeks, potable water, wastewater, stormwater, and reclaimed water resources. In accordance with the BCC's initiative, the Charlotte County Utilities Department (CCU) contracted Jones Edmunds to prepare potable water master plans for the County's existing water service areas (Mid County, West County, and South County) and to combine them into a County-wide Charlotte County Potable Water Master Plan (CCPWMP).

1.2 BACKGROUND

The Charlotte Harbor area was originally explored by Ponce de Leon in 1515 and 1521. In 1565, Spanish explorers named the area Carlos Bay after the Native American Calusa Tribe who inhabited Florida's southwest coast at the time. Early settlements on the outer islands failed due to confrontations with the local inhabitants, but Spanish and English settlements slowly developed along the banks of the Peace River.

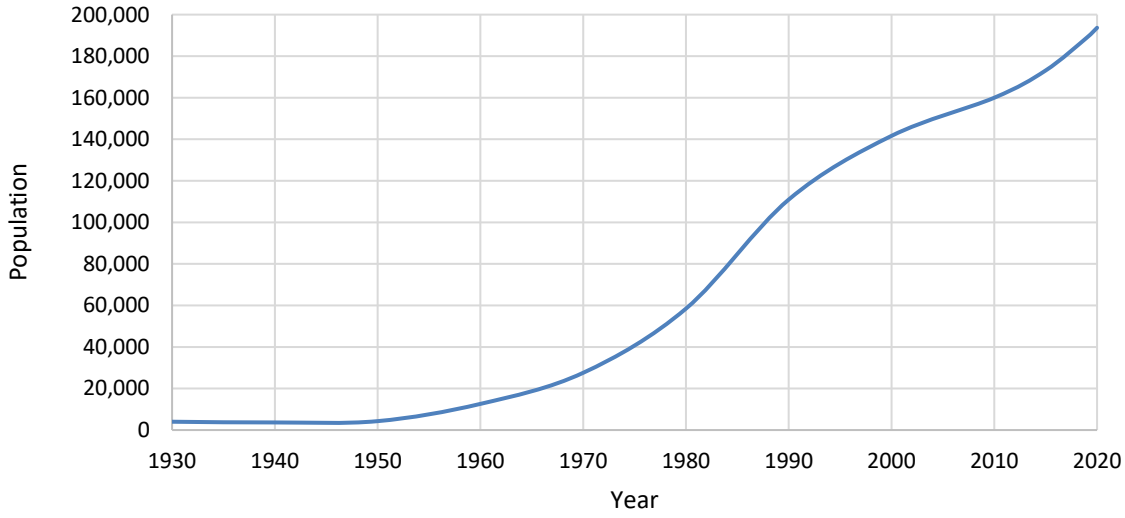
English settlers renamed the bay *Charlotte* in 1775 as a tribute to Queen Charlotte Sophia. In 1819, Florida was ceded to the United States by the Spanish and 26 years later became the 27th state. In 1885 Colonel Isaac Trabue purchased 30 acres on the south shore of Charlotte Harbor and established the Town of Trabue; today we know it as Punta Gorda.

Real change started to occur in 1886 when the Florida Southern Railroad arrived, connecting the area to the rest of the state. As the century ended, Punta Gorda became an important port for Cuban cattle shipments, and the harbor served as a fishing resource for mullet, Spanish mackerel, and channel bass.

In April 1921, the State approved dividing the original DeSoto County into five counties including Charlotte, Glades, Hardee, and Highlands Counties. The citizens of Punta Gorda voted to name their county after the bay, thus establishing Charlotte County. Today the County covers 694 square miles with approximately 126 square miles of waterways.

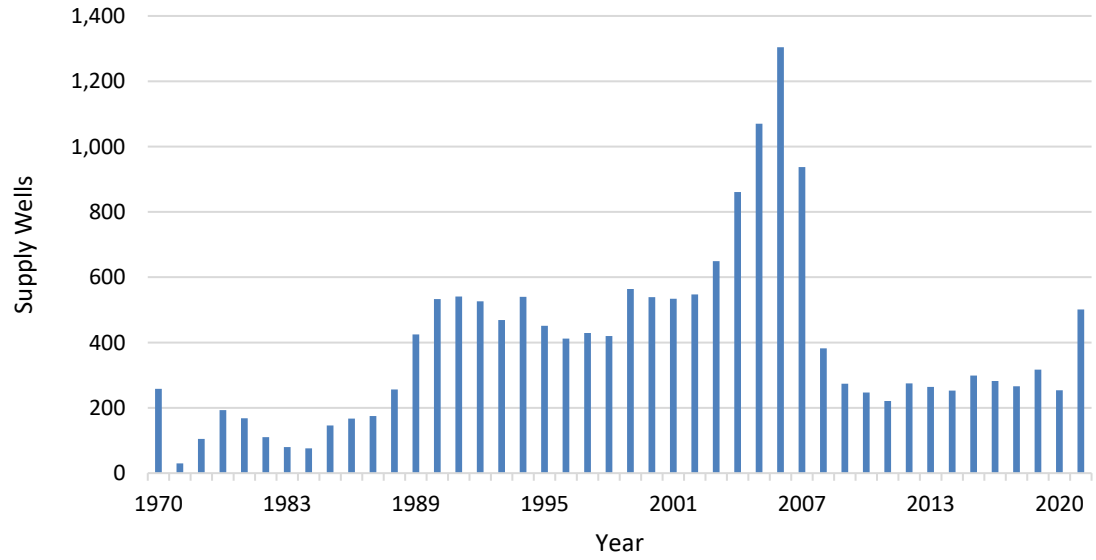
Growth took off after the General Development Corporation (GDC) established the unincorporated community of Port Charlotte in the 1950s, offering affordable homes in Florida's paradise to the rapidly expanding middle class. Attracted by the beautiful rivers, beaches, estuaries, and resources of Charlotte Harbor, the population grew rapidly and increased from fewer than 5,000 in 1950 to nearly 190,000 residents today (Figure 1-1).

Figure 1-1 Charlotte County Population by Year



As residents settled in the area, the need for water supplies increased, creating a greater need for water resources. Historically, groundwater drawn from the Floridan aquifer served as the primary source for drinking water in the County, leading to the number of supply wells steadily increasing over the years (Figure 1-2). As growth continued in the County, access to fresh water was drawn from surface water sources including the Peace and Myakka Rivers. Today, the primary sources of drinking water used in Charlotte County are drawn from the Floridan aquifer and Peace River.

Figure 1-2 Number of Supply Wells Installed in Charlotte County per Year

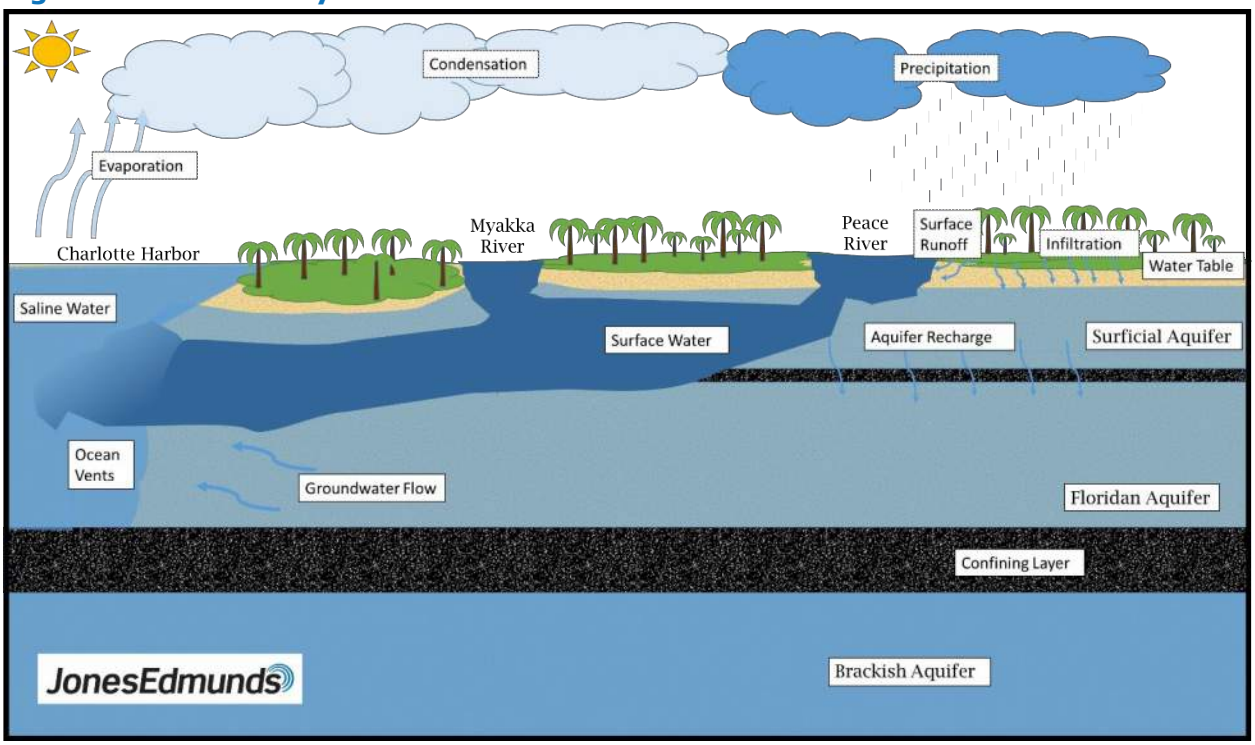


Today, we realize that freshwater supplies are not an unlimited resource and that humans can have significant impacts on the natural balance to the movement of water. Excessive groundwater pumping from freshwater aquifers can lead to several negative impacts including worsened water quality and depleted supplies. Conversely, overdrawing from surface water supplies can impact the rivers and downstream natural ecosystems.

Therefore, a balanced approach to water resource management is required for long-term sustainability and reliable drinking water supplies.

Planning for a balanced approach requires an understanding of the natural water cycle and impacts that man can have on the process. Figure 1-3 shows a simplified depiction of the natural water cycle. Oceans and the sun power the process of evaporation, which condenses to form clouds and leads to precipitation. The rainwater falls on the earth's surface where it is stored in plants and vegetation, infiltrates into the ground, or collects into surface water bodies such as lakes, streams, and rivers. The groundwater may be stored in aquifers, resurface in springs or ocean vents, or flow into other surface waters through the soil. The streams and rivers flow into lakes or the ocean and the cycle is repeated.

Figure 1-3 Water Cycle

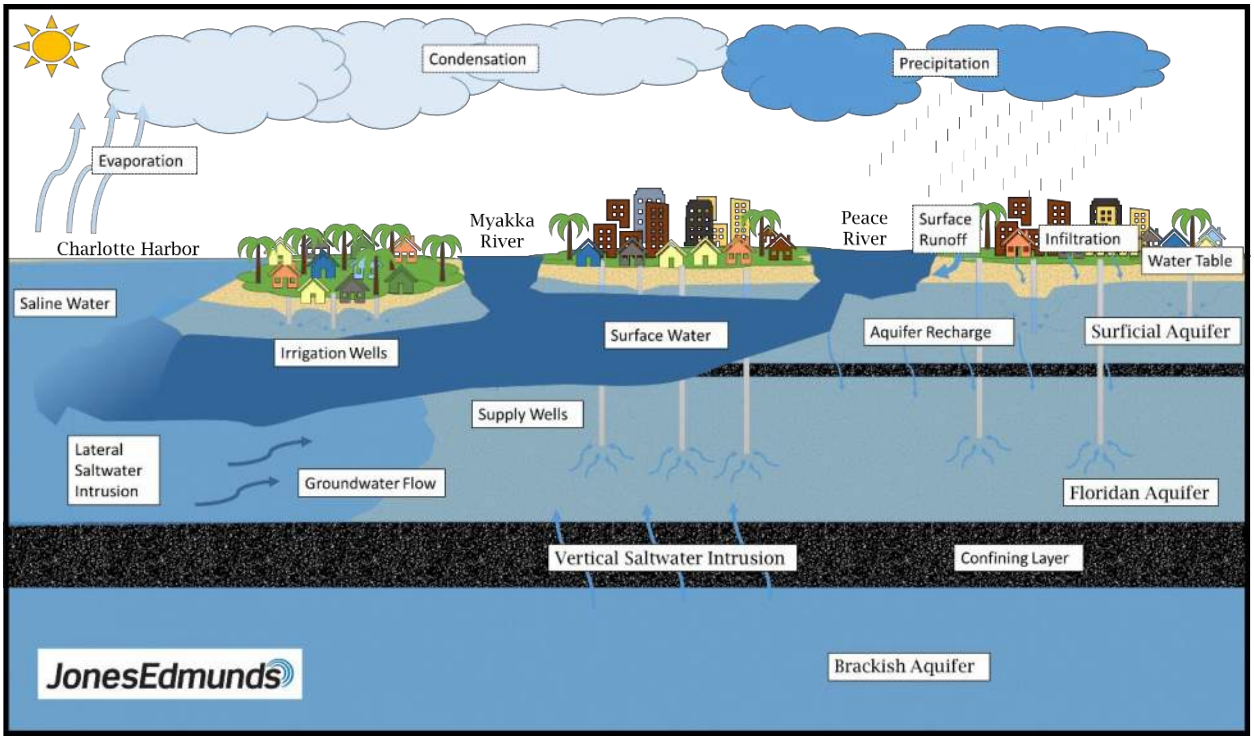


The water cycle explains the relationship between freshwater and saline water supplies. Over 96 percent of the world water supply is found in the world's oceans, seas, bays, and saline aquifers and lakes (US Geological Survey [USGS], 1993). Of the total fresh water, over 68 percent is stored in ice and glaciers, 30 percent in the ground, and less than 1 percent in rivers. The use of fresh water from rivers and aquifers is preferred over oceans and bays due to the high cost associated in treating saline water to meet drinking water standards. As such, aquifers and rivers will continue to be the primary and preferred source for raw water supplies.

Unfortunately, these sources do not contain an unlimited supply of water. The natural method of recharging an aquifer system, known as infiltration, is a slow process that can occur over decades. The slow process of recharging an aquifer limits the groundwater's ability to resurface in springs or ocean vents or flow into other surface waters through the soil. The County and Florida at large have seen a depletion in fresh groundwater due to years of excessive groundwater pumping. Groundwater depletion can lead to saltwater

intrusion by upward and lateral migration, drying up of supply wells, land subsidence, and reduction of water in streams and rivers. Figure 1-4 depicts the impacts of excessive ground and surface water use on the natural water cycle.

Figure 1-4 Man Impacts on the Water Cycle



Charlotte County has experienced some of these negative effects of a steady depletion of its groundwater and surface water bodies. The Peace and Myakka Rivers flow through Charlotte County and discharge into the Upper Charlotte Harbor, which directly impacts the Charlotte Harbor Estuary. To prevent these negative effects from worsening as population growth continues, CCU must plan for increases in water demand while also maintaining the delicate water balance.

CCU developed the CCPWMP to meet the BCC's goal of providing adequate potable water to the County in an environmentally sustainable manner by first outlining CCU's objectives, then following CCU's guiding principles, and working in conjunction with its partners and related plans.

1.3 OBJECTIVES

Developing and implementing the CCPWMP has become a joint effort of Charlotte County residents, key stakeholders, BCC, and CCU. A primary goal set by the BCC and outlined in the *Charlotte 2050 Comprehensive Plan* is to meet current and future water needs of the County residents while protecting the natural environment. This CCPWMP effort therefore provides Charlotte County with the information needed to maintain an adequate level of service (LOS) to supply high-quality affordable drinking water to residents of Charlotte County for the next 23 years, until 2045.

The following CCPWMP objectives support the BCC's goal:

- Summarize historical water demands and present the source, treatment, storage, distribution, and transmission components of the Charlotte County water system.
- Model and estimate system growth and water demands due to planned unit developments and infill.
- Identify methods to reduce potable water demands through water-conservation measures and reclaimed water use.
- Update the County's Water Conservation Plan (WCP) to increase the sustainability of the County's water supplies.
- Review water treatment capacities and identify water supply options and ways that CCU can participate in contributing to the Peace River Manasota Regional Water Supply Authority's (PRMRWSA's) water supply.
- Update the CCU water distribution system models to capture recent developments and expansion areas.
- Conduct model simulations through the planning horizon of 2050 to determine system requirements, size new transmission mains, identify expansion areas, reduce energy consumption, and increase system resilience.
- Create a water quality model for the Port Charlotte Water System to identify areas for reducing water age.
- Develop a water quality improvement plan by identifying looping locations to prevent dead-ends and reduce hydrant flushing.
- Develop a hydrant installation planning map to improve fire protection and allow CCU to meet their hydrant criteria goals.
- Identify large system connections (supply or users) and determine the impacts on the existing system.
- Develop capital improvement projects (CIPs) based on existing and future infrastructure needs and guiding principles.
- Identify funding programs and options for the County to implement the recommended CIPs.

1.4 GUIDING PRINCIPLES

The CCPWMP was developed as a collaborative effort to meet the common goal of the local and regional community to incorporate the guiding principles of affordability, sustainability, efficiency, reliability, resiliency, and modernization:

- Affordability – Each project identified in the CCPWMP focuses on developing affordable solutions for residents and business owners.
- Sustainability – The CCPWMP incorporates water conservation initiatives to provide a balanced approach to water use and environmental stewardship for managing Charlotte County's natural resources.
- Efficiency – The CCPWMP projects consider existing utility infrastructure and implement efficient construction methods such as lateral line coordination to decrease costs on road trenching and repair.
- Reliability – The CCPWMP considers existing water treatment and conveyance infrastructure and identifies which components will require updating to continue providing a reliable product to the County's residents and businesses.

- Resiliency – The CCPWMP identifies projects to increase resilience of its water systems such as redundant water mains, backup equipment, hardened facilities, and source water protection considering saltwater intrusion and sea level rise potential.
- Modernization – The CCPWMP builds on efforts to expand technology and use advanced tools for operating the utility.

1.5 Partners and Related Plans

Preparation of the CCPWMP fulfills the potable water component of the BCC's *One Charlotte One Water* strategy and is aligned with existing local, regional, and non-profit cooperating partner goals and objectives. Specifically, the CCPWMP addresses goals and objectives outlined in:

- CCU's Reclaimed Water Master Plan (Jones Edmunds, 2022)
- CCU's Supervisory Control and Data Acquisition (SCADA) Master Plan (McKim & Creed, 2020)
- CCU's Cyber Security Audit (CrimsonResolve, 2020)
- CCU's Water Systems Risk and Resilience Assessment (Jones Edmunds, 2020)
- CCU's Sewer Master Plan (Jones Edmunds, 2017)
- The County's Smart Charlotte 2050 Comprehensive Plan (Charlotte County BCC, 2010)
- Charlotte County Strategic Plan (Revised 2016)
- CCU's Water Supply Master Plan (Stantec, 2008)
- CCU's Water Conservation Plan (Malcolm Pirnie, 2008a)
- PRMRWSA Integrated Regional Water Supply Plan Update (HDR, 2020)
- PRMRWSA Integrated Regional Water Supply Plan (Atkins, 2015)
- Charlotte County Burnt Store Roadway Phase 2 – Utility Design project (Jones Edmunds, 2020)

Appendix A provides additional references cited throughout this report.

2. PAST & PRESENT – DEVELOPMENT OF A WATER UTILITY

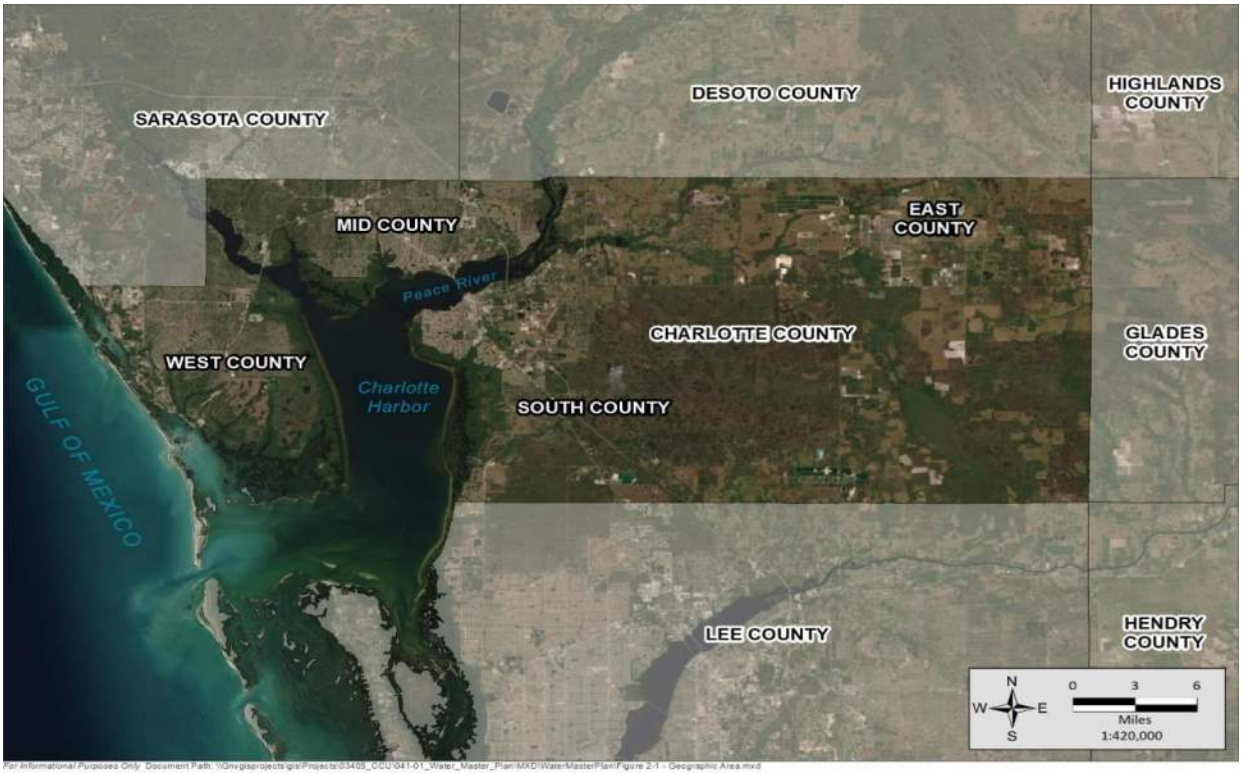
OVERVIEW

This chapter provides a brief historical perspective of the development of the Charlotte County potable water system including the inception of the system within the County, establishment of CCU in 1991, acquisition of private utilities, and a summary of the present-day potable water system. This chapter also reviews the County's ongoing potable water projects and operation and maintenance (O&M) programs.

2.1 WATER SYSTEM DEVELOPMENT

Charlotte County is trisected by the Peace and Myakka Rivers into three primary land masses. The central land mass between the two rivers is referred to as "Mid County." The Myakka River separates Mid County from the west coastal peninsula or "West County," and the Peace River forms the barrier between Mid County and the south and east areas of Charlotte County. The area to the south of Punta Gorda is referred to as "South County," and the area east of Mid County is referred to as "East County" as shown on Figure 2-1.

Figure 2-1 Charlotte County Geographic Area



The vast majority of Charlotte County remained virtually undeveloped for the first half of the 20th Century, consisting mostly of cattle rangelands, timberlands, groves, and a few homesteads. Lands that were subdivided or platted consisted primarily of the Englewood – Grove City area in West County, El Jobean and Charlotte Harbor areas in Mid County, and the City of Punta Gorda in South County.

In the mid-1950s, the Mackle brothers of Miami, Florida, began to purchase large tracts of land in the Mid and West County areas. The Mackle brothers, later known as GDC), platted the area for residential development communities, generally quarter-acre residential lots with some commercial areas along main corridors such as US Highway 41.

Most of the urban development in Charlotte County occurred in the west part of the county, i.e., west of Interstate (I)-75 to the Gulf of Mexico and immediately east of I-75. This area has direct or nearby access to Charlotte Harbor or the Gulf of Mexico. The most highly desirable real estate has direct access to water features, golf courses, or commercial services.

Most of the GDC developments in the area were supplied water from the GDC-owned and -operated water treatment facility on the Peace River, which was constructed in the 1970s and managed by GDC's subsidiary General Development Utilities (GDU). In the early 1990s, GDU went bankrupt and portions of the GDU water system were acquired by North Port Utilities, CCU, and PRMRWSA. PRMRWSA acquired the water treatment facility in Desoto County (now referred to as the PRMRWTF), the City of North Port purchased the distribution system that was in Sarasota County, and CCU purchased the water infrastructure within Charlotte County. The GDU system in Charlotte County was mainly in the Mid County area, but GDC also had water service in portions of Gulf Cove and South Gulf Cove in West County.

West County also included a relatively large water system built as part of the Rotonda development in the 1970s, and parts of Englewood East had water systems in the former West Charlotte Utilities area. Central water systems also existed in portions of South County, specifically in the incorporated City of Punta Gorda and the "Burnt Store" area bordering Lee County.

The County continued to grow over the years, and developments were established that contained their own water service providers. Water service providers in Florida can be public or private owned and include various classifications including municipalities, districts, authorities, associations, or small communities. Water service providers are typically regulated by governmental authorities such as the Florida Department of Environmental Protection (FDEP) and the Florida Department of Health (FDOH) to provide oversight and protect public health. Charlotte County is under the Florida Public Service Commission's (FPSC) jurisdiction, which also requires private utilities within the County to be certificated by the FPSC to operate, manage, control a water system. Public utilities have established service areas, and private utilities have certificated areas granted by the FPSC.

Three public and eleven private utilities are currently responsible for supplying potable water to Charlotte County residents. In addition, the County has eight small community developments that operate their own water supply. Any areas that are not depicted as a

certificated area fall within the CCU service area. As such, large areas of land within the CCU service area do not currently include water service.

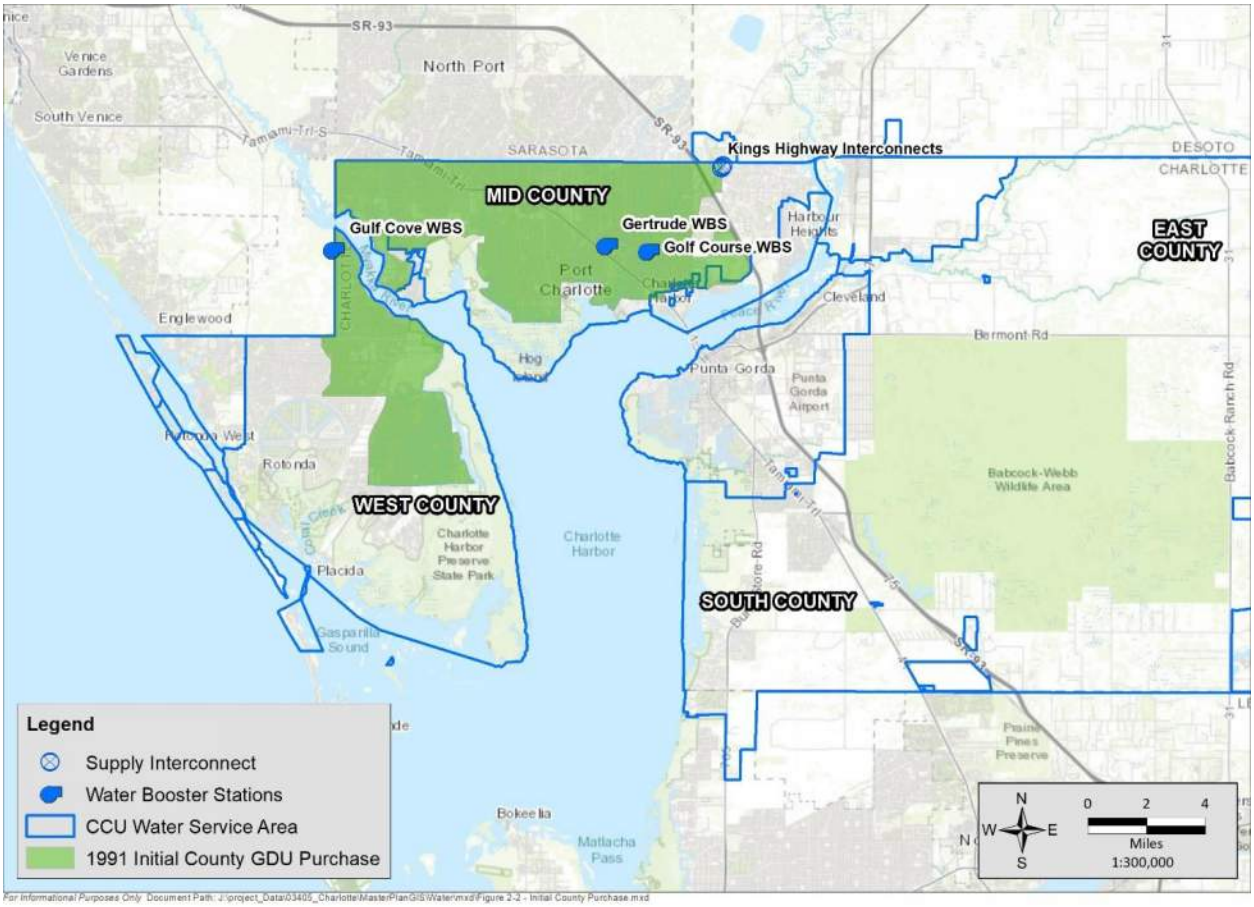
CCU is one of the oldest and the largest water providers in Charlotte County. A brief history of CCU is provided in the following section.

2.2 FORMATION OF CHARLOTTE COUNTY UTILITIES

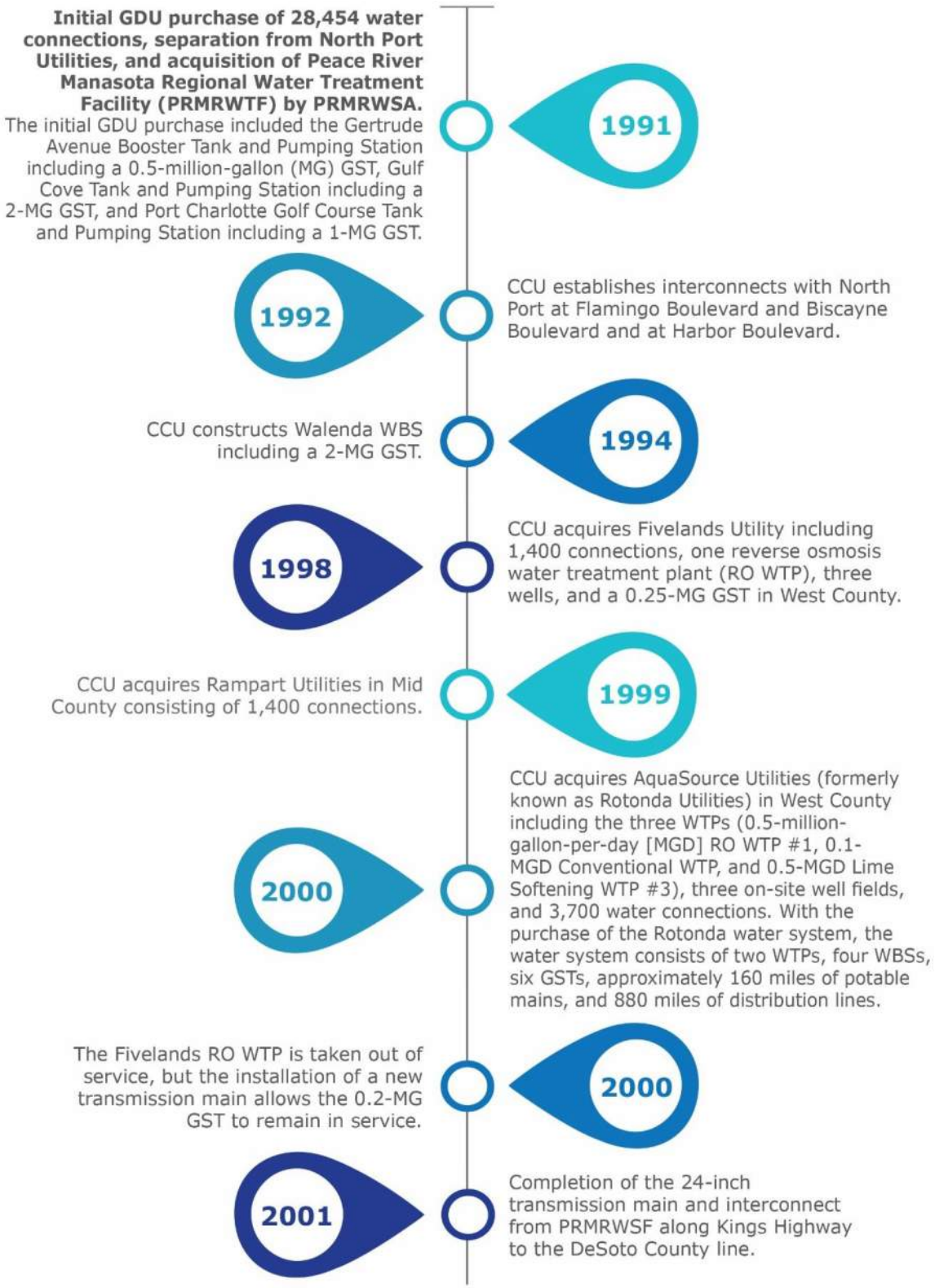
In 1991, Charlotte County purchased the GDU assets, forming the initial core of the CCU system in Mid County and in the Gulf Cove and South Gulf Cove areas of West County. The purchase included water and wastewater infrastructure including three water booster stations (WBSs), three ground storage tanks (GSTs), and approximately 610 miles of water mains serving approximately 28,500 water connections.

Figure 2-2 shows the 1991 water service areas purchased from GDU and highlights areas with water services, as well as the initial three WBSs that were purchased by CCU – Gertrude, Golf Course, and Gulf Cove WBSs.

Figure 2-2 Initial County Purchases from GDU in 1991



Charlotte County continued to expand its certificated service area beyond the 1991 acquisition in the following decades through subsequent purchases of other utility franchises, which include the following:



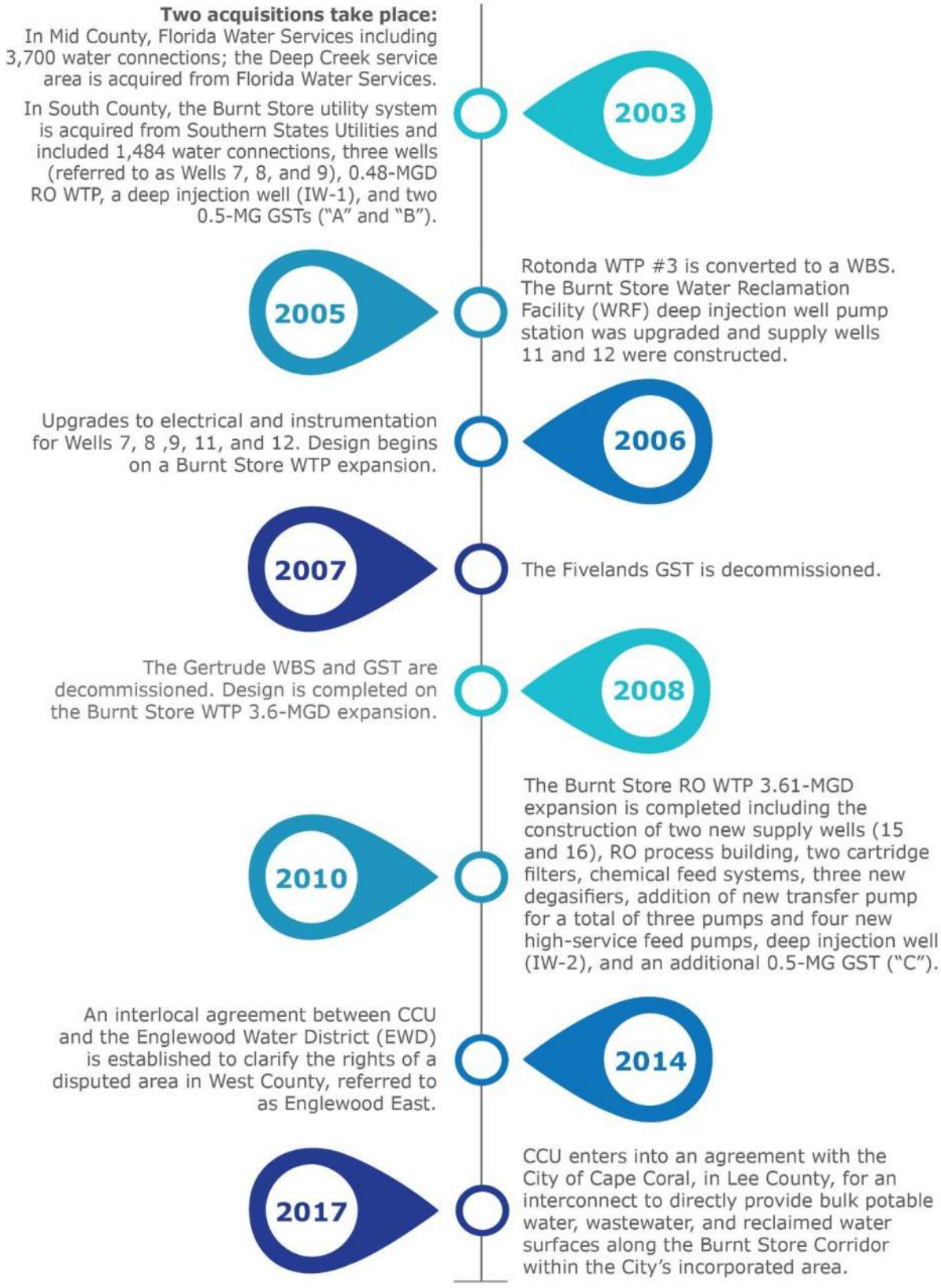
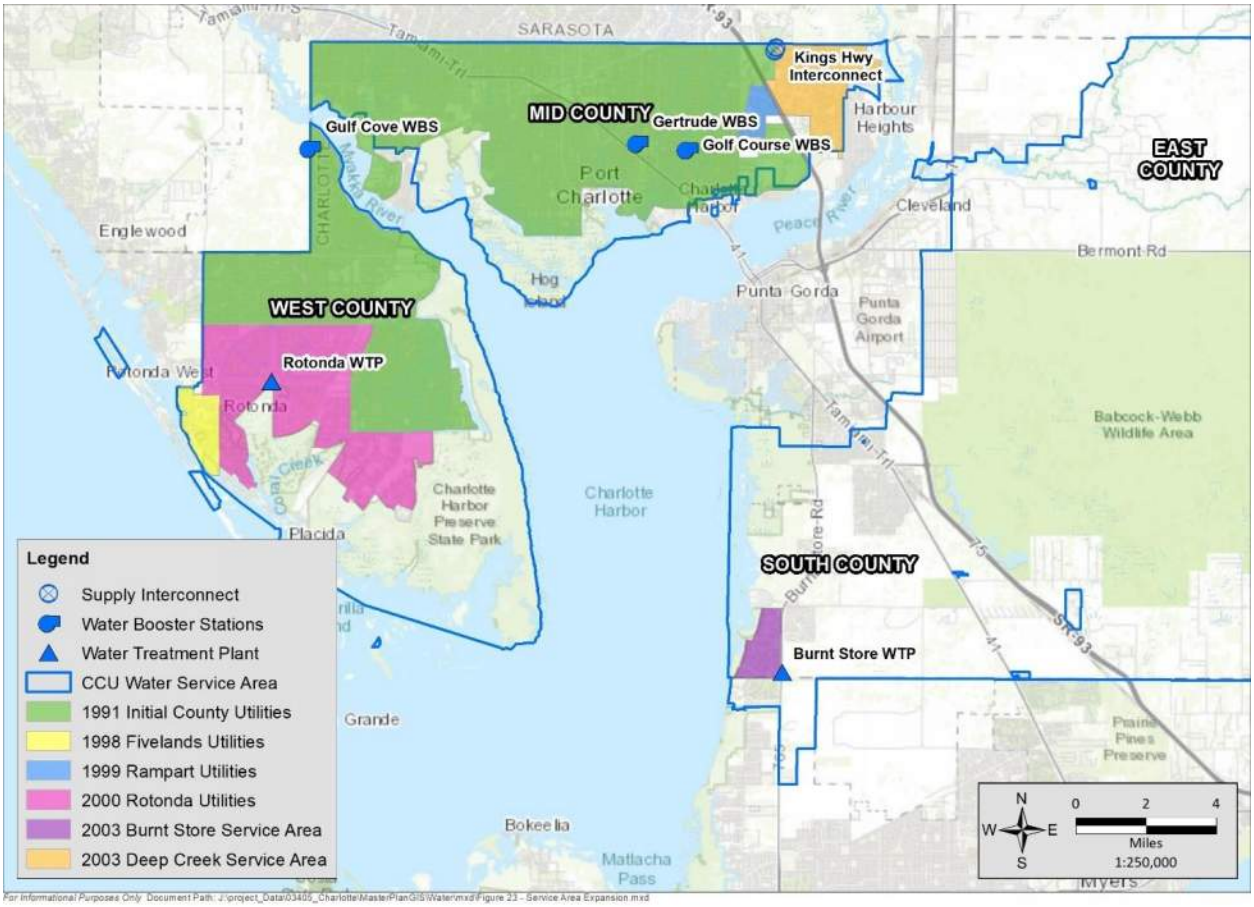

2003
Two acquisitions take place:
In Mid County, Florida Water Services including 3,700 water connections; the Deep Creek service area is acquired from Florida Water Services.
In South County, the Burnt Store utility system is acquired from Southern States Utilities and included 1,484 water connections, three wells (referred to as Wells 7, 8, and 9), 0.48-MGD RO WTP, a deep injection well (IW-1), and two 0.5-MG GSTs ("A" and "B").
2005
Rotonda WTP #3 is converted to a WBS. The Burnt Store Water Reclamation Facility (WRF) deep injection well pump station was upgraded and supply wells 11 and 12 were constructed.
2006
Upgrades to electrical and instrumentation for Wells 7, 8 ,9, 11, and 12. Design begins on a Burnt Store WTP expansion.
2007
The Fivelands GST is decommissioned.
2008
The Gertrude WBS and GST are decommissioned. Design is completed on the Burnt Store WTP 3.6-MGD expansion.
2010
The Burnt Store RO WTP 3.61-MGD expansion is completed including the construction of two new supply wells (15 and 16), RO process building, two cartridge filters, chemical feed systems, three new degasifiers, addition of new transfer pump for a total of three pumps and four new high-service feed pumps, deep injection well (IW-2), and an additional 0.5-MG GST ("C").
2014
An interlocal agreement between CCU and the Englewood Water District (EWD) is established to clarify the rights of a disputed area in West County, referred to as Englewood East.
2017
CCU enters into an agreement with the City of Cape Coral, in Lee County, for an interconnect to directly provide bulk potable water, wastewater, and reclaimed water surfaces along the Burnt Store Corridor within the City's incorporated area.

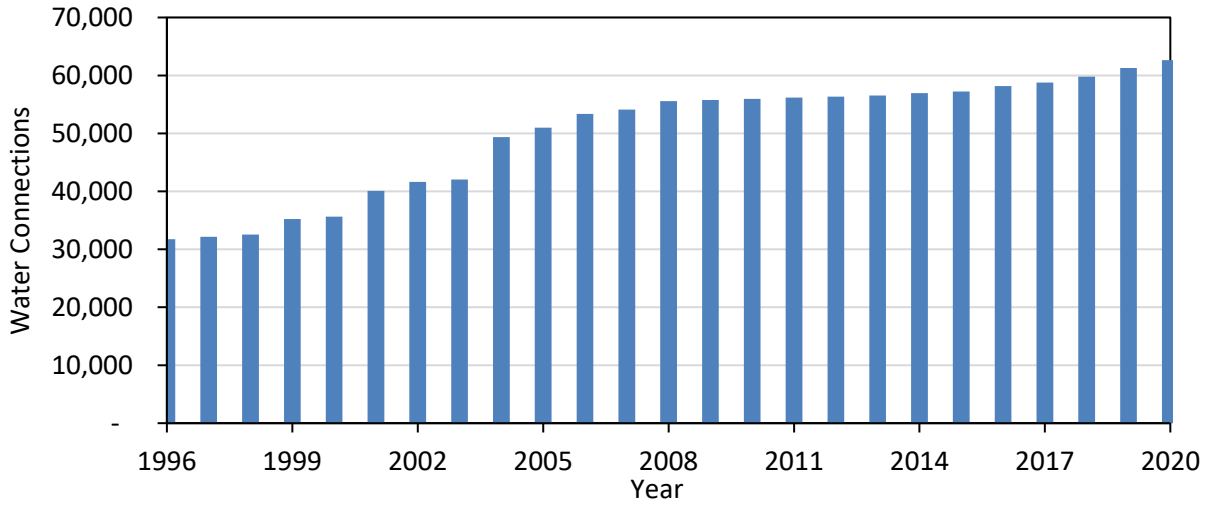
Figure 2-3 depicts these purchases and other expansions.

Figure 2-3 Expansion of County Water Service Area



Over the years, growth has continued in the area, and CCU has continued to increase its potable water connections throughout the County and connect the segregated distribution systems with water mains and transmission lines. Figure 2-4 displays the increases in the water connections from 1996 to 2021.

Figure 2-4 Historic Potable Water Connections



2.3 PRESENT DAY CCU WATER SYSTEM

CCU currently owns, operates, and maintains two independent public water systems (PWSs). The CCU PWS (ID 5084100), which will be referred to as the Port Charlotte Water System, is supplied finished drinking water by PRMRWSA and serves Mid and West County. The PWS contains supply interconnects, WBSs, and approximately 1,500 miles of water mains ranging in size from 2 to 24 inches in diameter. The South County Water System (ID 6080318), commonly called the Burnt Store Water System, is provided water from CCU's Burnt Store RO WTP and supplies drinking water to South County. This PWS does not currently have interconnects or WBSs and contains approximately 64 miles of water mains ranging in size from 2 to 20 inches diameter. The CCU certificated service area encompasses over 600 square miles including a small portion of Lee County, but only 138 square miles are currently provided water service. Within the entire CCU served area, CCU has nearly 62,928 customers. The primary water facilities within the CCU boundaries consist of the following:

- Burnt Store RO WTP.
- Five active groundwater supply wells.
- Seven GSTs (11.5 MGD total).
- Seven WBSs.
- Four water supply interconnects.
- Seven emergency interconnects.
- 1,564 miles of water main.
- 5,946 fire hydrants.
- 12,500 valves (approximately).

PWSs are regulated by FDEP and water management districts. FDEP is responsible for issuing identification numbers for PWSs and is the primary agency for water quality reporting. The water management districts are responsible for issuing water use permits (WUPs) and are the primary agencies for water quantity reporting. Since CCU purchases water from PRMRWSA, it maintains a wholesale WUP (No. 7104) for the Port Charlotte Water System and reserves an allocation of 16.1 MGD from PRMRWSA (WUP No. 10420). The Burnt Store WTP operates under WUP No. 3522, which was issued by the Southwest Florida Water Management District (SWFWMD) and must be renewed in 2033. In addition, CCU maintains a WUP at Babcock Ranch in East County from the South Florida Water Management District (SFWMD); the County was issued the WUP (No. 08-00129-W) for use as an emergency supply in 2011. Table 2-1 displays the permit information for the systems owned by the County.

Table 2-1 Potable Water Regulatory Permits per Service Area

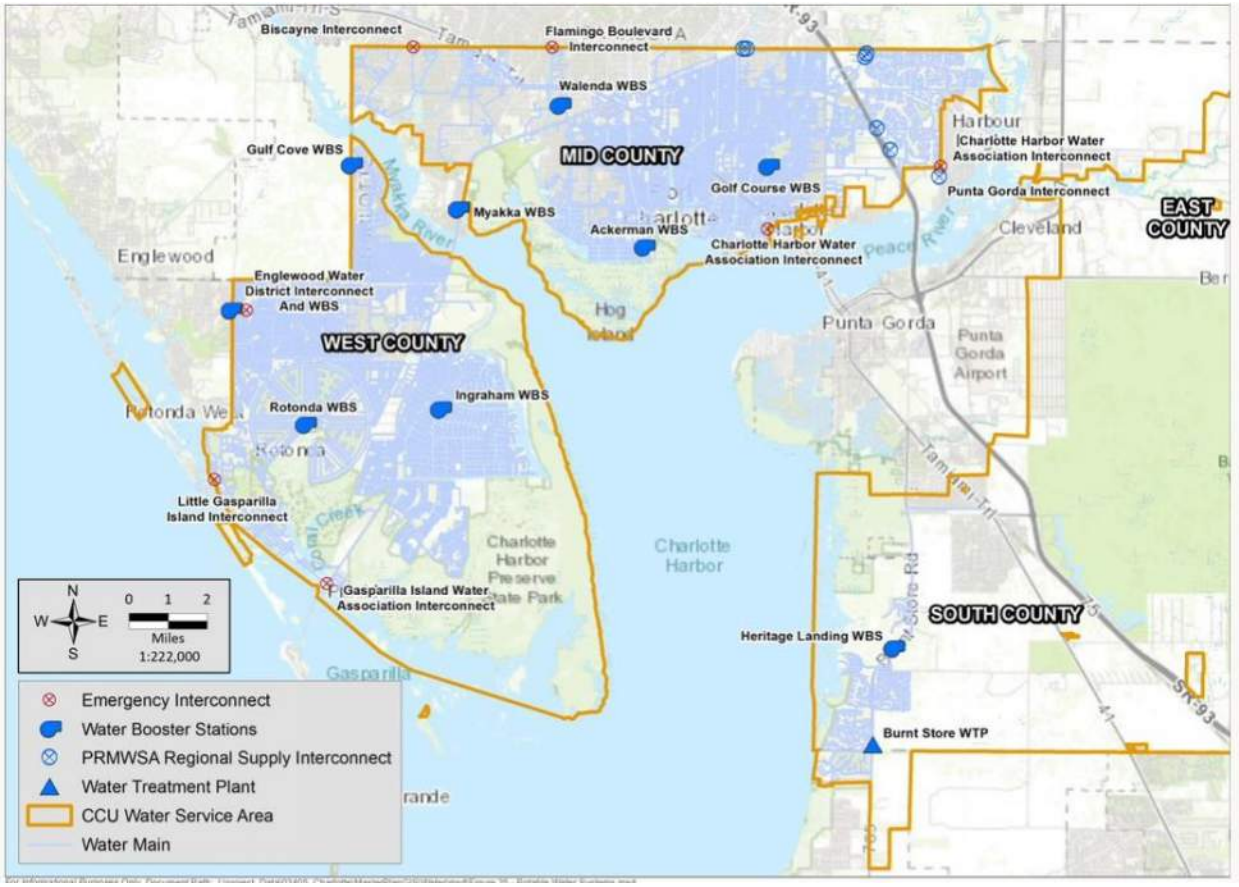
Service Area	Permit Type	Agency	Permit No.	Issue/Expire Date
Mid/West County	WUP[1]	SWFWMD	10420.011	Expires: 2/22/69
Mid/West County	WUP[2]	SWFWMD	7104.006	Issued: 9/8/15 Expires: 10/07/37
Mid/West County	PWS	FDEP	ID5084100	N/A

Service Area	Permit Type	Agency	Permit No.	Issue/Expire Date
South County	WUP	SWFWMD	3522.012	Issued: 9/25/13 Expires: 9/25/33
South County	PWS	FDEP	ID6080318	N/A
East County	WUP	SFWMD	08-00129-W	Issued: 12/19/11 Expires: 12/19/31

[1] PRMRWSA-owned surface water withdrawal WUP. [2] CCU-owned wholesale WUP.

Figure 2-5 shows the locations of primary facilities of CCU's potable water infrastructure relative to each service area. Chapter 3 provides further details regarding the present-day status of facilities and operations for CCU's Port Charlotte Water System and Burnt Store Water System. East County will not be included in report discussions since it is largely undeveloped with little to no infrastructure outside of three sample wells that were installed as part of the Babcock Ranch WUP permitting efforts.

Figure 2-5 Charlotte County Utilities Potable Water Systems



2.4 ONGOING PROJECTS AND PROGRAMS

CCU's numerous ongoing projects and programs for the potable water systems are related to CIPs, O&M needs, permit renewals, reports, and studies.

2.4.1 Ongoing Capital Maintenance and Improvement Projects

CCU's ongoing CIPs (BCC, 2022) are discussed in more detail in the following chapters and include:

- Installation of the Ackerman WBS in Mid County:
  - Installation of major water transmission lines.
- Ackerman Septic to Sewer Wastewater Expansion:
  - Includes new water mains and service lines.
- Lake View Midway Septic to Sewer Wastewater Expansion:
  - Includes new water mains and service lines.
- Emergency Interconnection between City of Punta Gorda and Charlotte County Burnt Store RO WTP for potable drinking water.
- Booster station upgrades to improve water quality and improve the water distribution system.
- Install chemical feed systems at the Englewood WBS.
- Installation of a potable water storage tank for the South County service area.
- Installation of a potable water elevated storage tank for the Mid County service area.
- Installation of a potable water elevated storage tank for the West County service area.

2.4.2 Ongoing O&M Programs

CCU's ongoing potable-water-related O&M programs, which are required for compliance and proper capital maintenance of the potable water systems, are conducted by the CCU Operations Division and the CCU Engineering Division. The main CCU Operations Division groups include the Treatment Facilities and Water Distribution groups, which includes subgroups for Field Repairs, Field Maintenance, Field Quality, and Booster Stations. The ongoing O&M programs include:

- Water Treatment and Distribution Monitoring, Sampling, and Reporting Compliance.
- Potable Water Connections and Meter Maintenance.
- Water Usage Monitoring Program.
- Potable Water Fire Hydrant Installation and Maintenance.
- Cross-Connection Control and Backflow Prevention (CCCP) Program.
- Identification and replacement of asbestos-cement (AC) and lead pipe.
- Predictive, Preventative, and Corrective Maintenance Program.

2.4.2.1 Water Treatment and Distribution Monitoring, Sampling, and Reporting Compliance

Potable water treatment and distribution system monitoring, sampling, and reporting compliance is a collaborative effort between the Operations and Engineering Divisions.

Operations of CCU's potable water treatment and distribution system facilities are performed in accordance with the licensing and staffing requirements of Chapter 62-602, Florida Administrative Code (FAC), and Rule 62-699.310, FAC, respectively. Monitoring, sampling, and reporting are performed in strict accordance with applicable permits and primary and secondary drinking water standards set forth by the US Environmental Protection Agency (EPA). CCU maintains the East Port Laboratory to support water-quality testing and ensure that the public water supply maintains drinking water standards set forth by EPA and FDEP; the laboratory is nationally certified by the National Environmental Laboratory Accreditation Program (NELAP). The Engineering Division oversees planning, implementation, and new construction permitting related to water treatment and distribution. Operations staff is solely responsible for regulatory compliance within the existing systems.

2.4.2.2 Potable Water Connections and Meter Maintenance

Potable water connection and meter maintenance is conducted in accordance with Chapter 25-30, FAC, which provides regulatory guidance for meter maintenance and setting utility rates (rates are covered in Chapter 5). Proper maintenance of connections and meters is critical for accurately tracking water usage and identifying leaks. CCU recently completed a 2010 objective to replace existing water meters with an advanced meter infrastructure (AMI) fixed-base meter system. The AMI system provides CCU with available, accurate water use readings to help minimize distribution system water losses and promote water conservation initiatives. For large meters, water use data are remotely read and wirelessly integrated with CCU's Computerized Maintenance Management System (CMMS) and Geographic Information System (GIS) software packages for purposes of recordkeeping, billing, and operations. CCU's database notifies staff which meters must be tested and/or replaced based on the last maintenance event and the registered age of equipment. Proper bookkeeping of accurate water use data assists CCU in minimizing revenue losses and reducing CCU staff's efforts required for completing Public Supply Annual Report (PSAR) surveys for their water systems.

2.4.2.3 Water Usage Monitoring Program

The Water Usage Monitoring Program refers to CCU's continuous efforts spent on monitoring and reporting water-use data. CCU uses numerous sources and tools to quantify water usage in each of its distribution systems. The primary tools used for quantifying the data include the SCADA and AMI systems, which are used to collect water use data from the CCU flow meters. Flows are monitored and reported on various intervals (e.g., continuously, minute basis, daily, hourly, monthly), depending on each meter's capabilities. The data retrieved from these systems are used to track the water produced and water sold for each PWS as well as for billing customers. CCU frequently compares the revenue-generating water (water sold) to the non-revenue-generating water to assess the condition of their distribution systems. Non-revenue water is calculated from the difference of the water produced versus water sold, which is the comparison of the total water entering the distribution system and the total water billed to customers.

Significant efforts are spent by CCU staff in sorting, analyzing, and confirming the reliability and accuracy of flow data as it impacts customer billing and utility operations. The utility's goal is to minimize non-revenue-water use as much as practical. Non-revenue water includes water used for known and allocated purposes and unknown or unallocated

purposes including water used for construction, firefighting, and hydrant flushing as well as water attributed or assumed from line breaks and water losses. These concepts are discussed in more detail in Section 5.3.3. The data collected as part of the Water Usage Monitoring Program are used for various purposes including tracking historical water use, determining projected water demand requirements, locating inefficiencies and potential water losses in the distribution system, identifying leaks, quantifying revenue and non-revenue water, monitoring large users and monthly per-capita usage, and identifying connections requiring meter maintenance or replacement. The program serves as a proactive approach in maintaining the efficient use of the water supply.

2.4.2.4 Potable Water Fire Hydrant Installation and Maintenance

The main drivers behind potable water fire hydrant installation and maintenance are water quality assurance and fire prevention and control. Fire hydrant flushing is widely used to maintain high water quality and is considered a best management practice (BMP) by the American Water Works Association (AWWA); flushing will be discussed more throughout this report. Chapter 633 of the Florida Statutes (FS) establishes fire prevention and control requirements to protect the safety of life and property in the event of a fire. The Florida Fire Prevention Code (FFPC) provides the minimum standards related to fire prevention and control, an adoption of applicable codes and standards set forth by the National Fire Protection Agency (NFPA). As a PWS owner, CCU is responsible for ensuring adequate fire protection is provided throughout their distribution systems, including but not limited to fire hydrants and supporting water distribution system infrastructure. To accomplish this, CCU works with the Charlotte County Public Safety Department, Fire & EMS Fire Prevention Division, to oversee the design, installation, and testing of fire protection within the distribution systems. Responsibilities of the Fire Prevention Division include reviewing new development construction plans, inspecting new and existing occupancies, conducting annual testing of fire hydrants, and enforcing code compliance. The County's policy requires testing and inspection of fire hydrants following installation and then once per year at a minimum to ensure satisfactory operation in accordance with AWWA Manual M17 *Installation, Field Testing and Maintenance of Fire Hydrants*. Per Charlotte County Code, annual testing is conducted by the Fire Prevention Division but CCU assists with maintaining hydrants due to CCU labor shortages.

2.4.2.5 Cross-Connection Control and Backflow Prevention (CCCP) Program

CCU's Reclaimed and Support Services Division is responsible for maintaining CCU's CCCP Program. Utilities that serve potable and reclaimed water must establish and implement an FDEP-approved CCCP Program in accordance with Rule 62-550.360, FAC. The purpose of the CCCP Program is to implement routine cross-connection control procedures to detect and prevent cross-connections that create or may create an imminent and substantial danger to public health. CCU's CCCP, titled *Manual of Rules and Regulations Governing Cross-connection Control and Backflow Prevention,* was prepared in accordance with the guidelines set forth in AWWA Manual M14: *Recommended Practice for Backflow Prevention and Cross-Connection Control*. At the time of this report, the current approved CCCP is in the process of being updated.

2.4.2.6 Identification and Replacement of AC Pipe

Identification and replacement of AC pipes is not currently required by Florida law. However, PWSs must either certify pipes as AC free or provide an AC sampling plan and water-quality testing results in accordance with the schedule provided by Form 62-555.900(10), FAC (3 consecutive years of sampling every 9 years). CCU has not yet established a proactive rehabilitation and replacement (R&R) program of AC pipe but replaces these pipes as necessary or as they are discovered.

CCU is currently implementing Cityworks asset management system as part of the County's modernization initiatives. This program will be used to track assets including pipes, pipe material, and age, which will then be used to establish a proactive R&R program for the distribution system water mains. In addition to Chapter 62-55, FAC, the removal, replacement, or demolition of AC pipe or AC components should also be conducted in accordance with Chapters 62-257 and 62-204, FAC, and Form 62-257.900(1) should be filed if applicable.

2.4.2.7 Predictive, Preventive, and Corrective Maintenance Program

CCU performs three types of maintenance on its water distribution systems: predictive, preventive, and corrective. In predictive maintenance, tests and observations are performed on equipment to predict when failure of the component might occur. Preventive maintenance involves exercising components such as valves and hydrants, changing lubricants, and replacing wearable parts on a schedule of time or usage. Preventive maintenance is most suitable for equipment that must be ready to be operated, even though it is typically not in use. Corrective maintenance occurs when an abrupt failure occurs or when the system is compromised by others, such as a cable installer puncturing a water main. Corrective maintenance focuses on restoring service as soon as possible, even with a temporary repair to be upgraded later. Maintenance begins with a service order (SO). Predictive and preventive SOs are generated by CCU staff, so when maintenance is performed, it is flexible. SOs are scheduled at such a time to be most efficient in terms of the availability of resources, especially labor. Corrective SOs are usually generated by a customer phone call and are typically performed as soon as possible.

2.4.3 Ongoing Permit Renewals, Reports, and Studies

Lastly, CCU manages several recurring permit-renewal efforts and conducts reports and studies related to tracking inventory, workload management, and system optimization.

2.4.3.1 Permit Renewals

- FDEP Domestic Wastewater Facility Permit for Burnt Store WRF (FLA014083) – Expires December 28, 2026. Renewal is required 180 days before expiration to maintain operations of a Class I underground injection well system U-001 used for disposal of RO concentrate produced by the Burnt Store RO WTP. U-001 includes injection wells IW-1 and IW-2, which must be renewed separately through FDEP's Underground Injection Control (UIC) program. See related information herein.
- FDEP UIC Permit for IW-1 (No. 0271367-007-UO/1I) – Expires May 14, 2024. Renewal is required 60 days before expiration to maintain operations for disposal of RO concentrate produced by the Burnt Store RO WTP. Requires recurring mechanical integrity testing every 5 years per Rule 62-528.425, FAC.

- FDEP UIC Permit for IW-2 (No. 0271367-006-UO/1X) – Expires August 18, 2027. Similar purpose and renewal requirements as IW-1.
- SWFWMD WUP for Burnt Store Wellfield (No. 3522) – Expires September 25, 2033. Renewal required for withdrawal of water used for production of finished water at Burnt Store RO WTF.
- SWFWMD WUP for CCU Wholesale (No. 7104) – Expires October 7, 2037. Renewal required for the purchase of finished water from PRMRWSA and subsequent distribution to customers in the CCU service area (currently only used for Mid/West County).
- SFWMD WUP for Babcock Ranch Wellfield (No. 08-00129-W) – Expires December 19, 2031. Permit currently authorizes withdrawals for secondary use only. Three sample wells were installed as part of this permitting effort, which CCU may use to collect water quality and groundwater level data. Renewal is required to retain secondary use permit and/or modify existing authorization.

2.4.3.2 Reports and Studies

- Updating and refining potable water hydraulic models for identifying hydraulic and water quality deficiencies.
- Incorporating potable water infrastructure and maintenance into CCU's Cityworks asset management system.

3. CURRENT WATER SUPPLY, TREATMENT, AND DISTRIBUTION

OVERVIEW

As discussed in Chapter 2, CCU water treatment facilities and water distribution systems exist within Mid/West County and South County. This chapter presents an abridged system overview for each PWS, followed by a detailed summary of each PWS's components including water supply, allocation, treatment, and distribution system facilities. In addition, the deficiencies identified from the condition assessment performed and reported on in the CCU Annual Report (Jones Edmunds, 2021) are listed herein to further contribute to the development of capital maintenance and improvement projects.

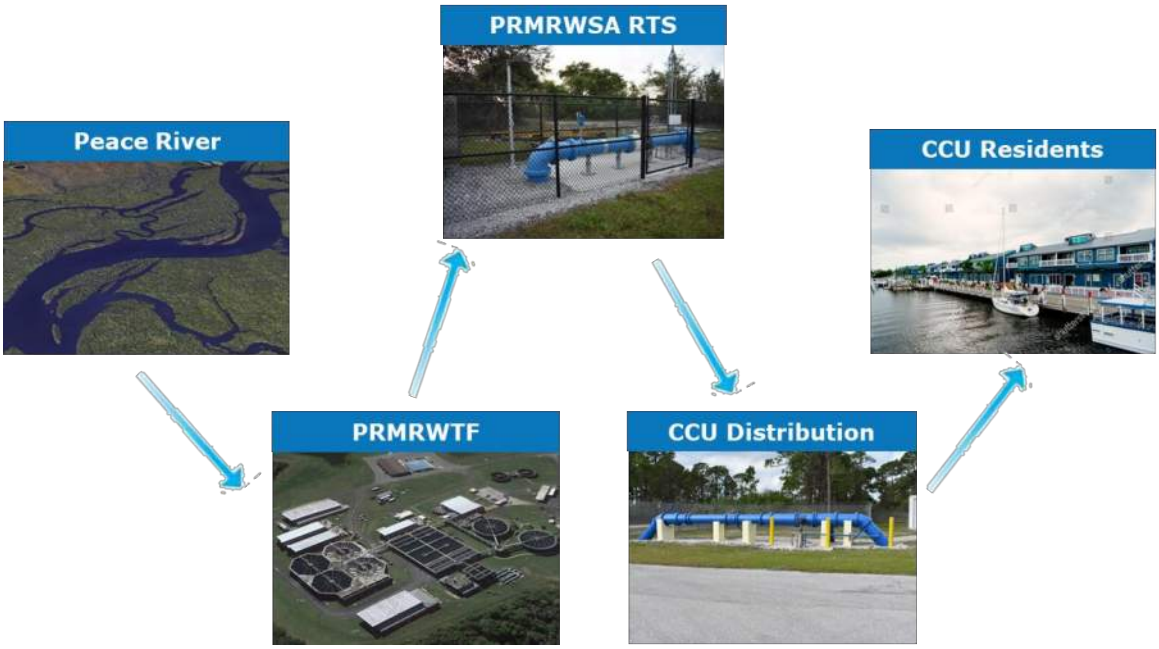
3.1 Mid/West County – Port Charlotte Water System

The larger of the two PWSs owned by CCU serves Mid and West County and is officially named the Charlotte County Utilities PWS (ID 5084100) but will be referred to as the Port Charlotte Water System. The Port Charlotte System is considered a consecutive PWS in that it purchases all its potable finished water supply wholesale from PRMRWSA, a regional water supplier. The water is treated at the PRMRWTF and conveyed to CCU through the PRMRWSA regional transmission system (RTS). The treated water enters the CCU distribution system through water-supply interconnects, at which point it becomes CCU's responsibility to maintain primary and secondary drinking water standards. To meet these standards, CCU has installed WBSs at various locations in the distribution system, which are used to maintain proper disinfectant residual concentrations, boost pressure and flow, and store water to account for water demand variations. Figure 3-1 illustrates the water path from source to customer for the Port Charlotte Water System. The following sections provide additional supply, treatment, and conveyance details.

3.1.1 Port Charlotte Water System Source Water Supply

The source water provided by PRMRWSA primarily originates from the Peace River. SWFWMD has authorized PRMRWSA to directly withdraw raw water from the Lower Peace River to meet the water demands of its customers. The WUP authorizes withdrawals of 80 MGD annual average daily flow (AADF) or 258 MGD maximum daily flow (MDF). However, SWFWMD has also established a minimum flow level (MFL) for the Peace River, which must be maintained year-round for environmental purposes regardless of PRMRWSA water demands. Since Peace River flows vary naturally based on seasonal rainfall patterns, withdrawal amounts are sometimes limited during dryer months. To accommodate seasonal withdrawal limitations, PRMRWSA built an advanced water storage system comprising 6.5 billion gallons (BG) of reservoir storage and 21 aquifer storage and recovery (ASR) wells capable of storing an additional 7 BG. PRMRWSA operates these systems to increase the resilience of its system and maintain compliance with the Peace River MFL and its WUP.

Figure 3-1 Port Charlotte County System Overview



In 2013, PRMRWSA was also issued a 20-year Operational Flexibility Water Use Permit (OFWUP #12926), which authorizes PRMRWSA to receive up to 7.251 MGD AADF and 11.6 MGD peak monthly flow (PMF) from neighboring utilities if the Peace River is temporarily unavailable for withdrawals. Table 3-1 summarizes the PRMRWSA permitted water supplies, including the WUP (primary) and OFWUP (secondary/tertiary) water-supply sources and capacities.

Table 3-1 PRMRWSA Permitted Water Supplies

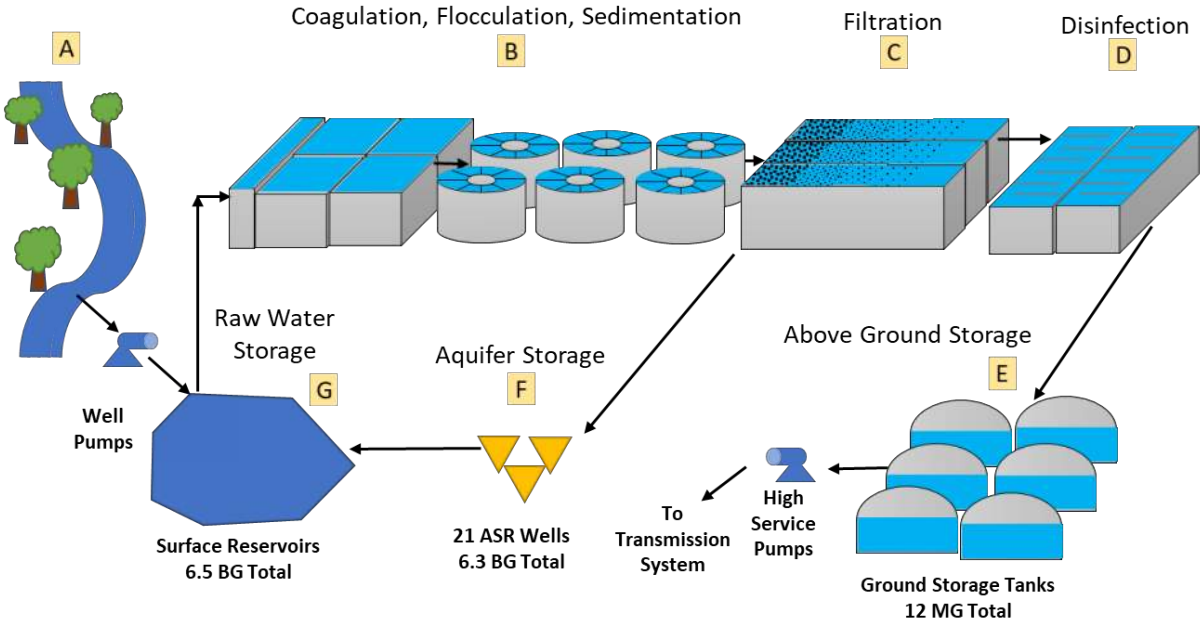
Permit	Water Supply Source	Water Supply Type	Ownership	Water Supply Capacity (MGD)		
				AADF	MDF	PMF
WUP	Lower Peace River	Surface Water	PRMRWSA	80.0	258.0	N/A
OFWUP	T. Mabry Carlton Jr. Memorial Reserve Wellfield	Brackish Groundwater	Sarasota County	5.00[a]	N/A	5.00[a]
OFWUP	Shell Creek Reservoir	Surface Water	City of Punta Gorda	2.20[a]	N/A	6.00[a]
OFWUP	Project Prairie Site[b]	Groundwater	DeSoto County	0.051[a]	N/A	0.600[a]
OFWUP	Selma Avenue WTP	Brackish Groundwater	EWD	2.00[c]	N/A	2.00[c]
	Primary Source – WUP Water Supply			**80.0**	**258.0**	**N/A**
	Secondary Source – Available OFWUP Water Supply			**7.251[a]**	**N/A**	**11.6[a]**
	Tertiary Source – Emergency OFWUP Water Supply			**2.00[c]**	**N/A**	**2.00[c]**

[a] Capacities are in addition to capacities authorized under respective water supply source permits.
[b] This facility is now operated by PRMRWSA under OFWUP #12926.
[c] Capacities are not included in OFWUP #12926. Represents excess capacities that may be available.

3.1.2 Peace River Manasota Regional Water Treatment Facility

Although the WUP authorizes PRMRWSA to withdraw up to 80 MGD, the permitted maximum day operating capacity of the PRMRWTF is limited to 51 MGD AADF. The PRMRWTF is a surface-water treatment plant on Kings Highway in DeSoto County, just northeast of Charlotte County. The PRMRWTF uses a conventional water treatment process to remove unwanted constituents from the surface water and produce high-quality drinking water. Figure 3-2 displays the process flow diagram for the PRMRWTF. Raw water is drawn from the Peace River (A) and conveyed to the coagulation, flocculation, and sedimentation basins (B) for conventional treatment. The water is conveyed through media filters (C) to remove additional particles and reduce suspended solids. The water is then conveyed to the chlorine contact basins (D) where it is disinfected and stored in the GSTs (E). The PRMRWTF provides regional storage of the finished (fully treated) water and conveys it to the member governments (customers) through its regional transmission system. Operators can also convey partially treated water to the ASR wells (F) for long-term storage. This water is recovered and conveyed to the PRMRWTF's surface reservoirs (G) and retreated as needed to address prolonged dry periods.

Figure 3-2 PRMRWTF Process Flow Diagram



Since PRMRWSA is responsible for initial treatment, conveyance, and production of finished water, it is responsible for meeting the monitoring, sampling, and reporting requirements for source water and entry point samples in accordance with FDEP regulations as well as meeting the primary and secondary drinking water standards throughout the regional transmission system, which now includes over 80 miles of large-diameter water transmission mains capable of conveying a combined total of over 100 MGD AADF to the region. PRMRWSA currently provides an average of 26 MGD of finished potable water to Charlotte, DeSoto, Manatee, and Sarasota Counties and the City of North Port. Although the current AADF indicates only 51 percent of the PRMRWSA's permitted capacity is being used, each regional member has been guaranteed supply based on the water allocations established in the Master Water Supply Contract (MWSC).

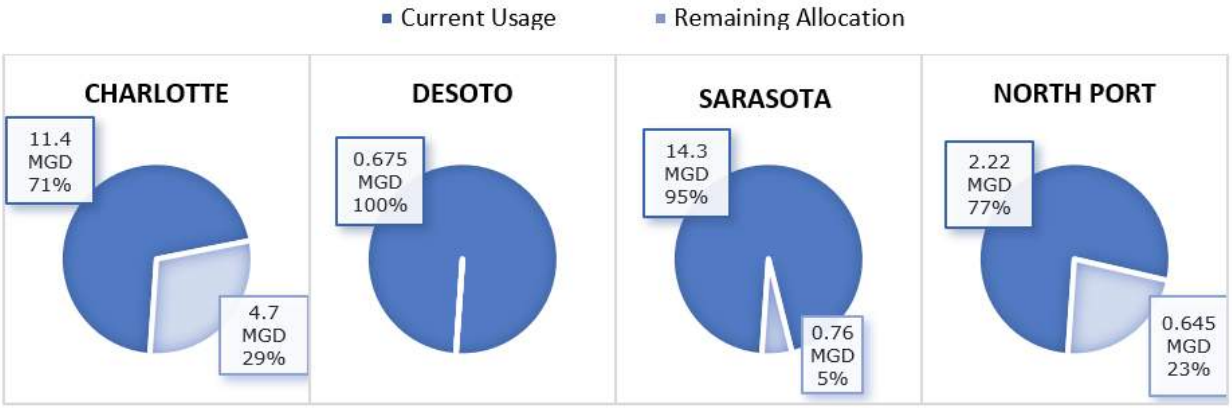
The allocations listed in Table 3-2 indicate that 68 percent of PRMRWSA's permitted supply has been allocated to the members. In the early 2000s, PRMRWSA implemented a 17-percent reserve capacity as a BMP to ensure average daily production meets demand (*IRWSP 2020 Update*, HDR). Therefore, the total allocated supply and adopted resiliency standard represent approximately 85 percent of the permitted supply. Manatee County is not a current customer but is expected to receive an allocation of 5 MGD by 2037. If the PRMRWSA has committed to provide 5 MGD to Manatee County, then approximately 95 percent of the permitted supply would be accounted for and only 4.55 MGD would be available on an AADF basis.

Table 3-2 AADF Finished Water Supply Allocations

PRMRWSA Capacity Milestones	Charlotte County	DeSoto County	Sarasota County	City of North Port	Manatee County	Total
Original PRF (1991)	10.758	0.050	0.0	1.192	0.0	12.000
Peace River Option (PRO) (1996)	2.000	0.500	3.500	0.0	0.0	6.000
Reg. Expansion Prog. (REP) (2009)	3.342	0.125	9.725	1.508	0.0	14.700
1991 Rebuild (2015)	0.0	0.0	1.835	0.165	0.0	2.000
Total	**16.1**	**0.675**	**15.06**	**2.865**	**0**	**34.700**

CCU's current allocation is limited to 16.1 MGD AADF, 19.32 MGD PMF, and 22.54 MGD MDF basis. Figure 3-3 displays the 2021 usage and remaining AADF quantities under the current allocations for each PRMRWSA member. The figure shows that CCU is using approximately 71 percent of its allocated supply. Based on discussions with PRMRWSA staff, no additional allocation is available for future negotiation without an expansion to the PRMRWTF. This may be due to unknown treatment or conveyance limitations, extra resilience measures, or limitations on MDF conditions. Historically, the MWSC uses a PMF factor of 1.2 and a MDF factor of 1.4 to determine customer PMF and MDF demands. Assuming all current customers demanded the full amount of their water supply allocations on an MDF basis, the total finished water supply allocation would equal 48.580 MGD, or approximately 95 percent of the PRMRWTF total rated capacity.

Figure 3-3 Current Usage and Remaining Allocations per PRMRWSA Member



3.1.3 PORT CHARLOTTE DISTRIBUTION SYSTEM

3.1.3.1 INTERCONNECTS

CCU purchases finished water for the Port Charlotte Water System from PRMRWSA through four metered supply interconnects, but has seven interconnects in total. The CCU-PRMRWSA supply connections are on the north and east edges of the Mid County distribution system. The Kings Highway and Harbor Boulevard connections contain interconnect vaults and telemetry, which are owned and operated by PRMRWSA but can be accessed by Charlotte County. The Harbor Boulevard interconnect ties into the north end of the Mid County distribution system, whereas additional connections lie off the buried transmission main along I-75 (Rampart, Luther, and Sandhill). These interconnects do not have flow monitoring at each location; instead, the flow is calculated from the flow meters on Kings Highway and the flow meter at the Discovery Drive interconnect. The Discovery Drive interconnect is owned and operated by PRMRWSA, which was historically used to supply water to the City of Punta Gorda during the dry season and receive water from the Punta Gorda system during the wet season. As of fiscal year (FY) 2021, this seasonal operation has ceased, and the interconnect is only used to supply CCU water from PRMRWSA. Table 3-3 lists the Charlotte County metered supply interconnects with PRMRWSA. According to the MWSC, PRMRWSA is required to deliver finished water at a minimum pressure of 65 pounds per square inch (psi) at each of these interconnects.

Table 3-3 Charlotte County Metered Supply Interconnects

Entity	Name	Size	Status
PRMRWSA	Discovery Drive Meter Station	24-inch	Normally opened
PRMRWSA	Kings Highway Meter Station	24-inch	Normally opened
PRMRWSA	Kings Highway Meter Station	12-inch	Normally opened
PRMRWSA	Harbor Boulevard Interconnect	24-inch	Normally opened

As an additional safeguard for uninterrupted water supplies to Charlotte County citizens, CCU has additional emergency interconnects with adjacent water distribution systems. These interconnects are manually operated, equipped with bi-directional flow meters, and connected to the County's AMI system. The County has two 6-inch interconnects with Charlotte Harbor Water Association (CHWA), one 16-inch and one 12-inch interconnect with the City of North Port, two interconnects with the Gasparilla Island Water Association (GIWA), and one interconnect with EWD. Table 3-4 lists CCU's emergency interconnects with neighboring utilities.

Table 3-4 Charlotte County Emergency Interconnects

Entity	Name	Size	Status
CHWA	CHWA Interconnect	6-inch	Normally closed
CHWA	CHWA Interconnect	6-inch	Normally closed
City of North Port	Flamingo Boulevard Interconnect	12-inch	Normally closed
City of North Port	Biscayne Drive Interconnect	16-inch	Normally closed
GIWA	GIWA Interconnect	10-inch	Normally closed
GIWA	GIWA WTP Interconnect	6-inch	Normally closed
EWD	Englewood Interconnect	12-inch	Normally closed

According to the *2021 CCU Annual Report*, the supply and emergency interconnects were reported to be in good condition. No upgrades, replacements, or repairs were prescribed. In addition, the emergency interconnects are operated manually for maintenance but have not been used in recent years to provide emergency supply.

3.1.3.2 Water Booster Stations

As mentioned previously, CCU maintains and operates WBSs #2, 3, 4, 6, 8, and 9. CCU has repurposed the Gertrude WBS (#1) and discontinued the Fivelands WBS (#5). The WBSs are strategically located in the CCU distribution system to increase the flow, pressure, and disinfectant concentrations throughout the system; typically, WBSs are equipped with GSTs, high-service pumps (HSPs), chemical feed skids, chemical storage, electrical components, and dedicated backup power supply (commonly a diesel generator equipped with a fuel tank). Each chemical feed skid includes two metering pumps. CCU operates chemical dosing of ammonium sulfate [$(NH_4)_2SO_4$] and sodium hypochlorite (NaOCl) throughout the Port Charlotte Water System to maintain a chloramine residual between 0.6 and 4.0 milligrams per liter (mg/L), in accordance with FDEP and EPA water quality standards. The following sections describe each WBS and summarize the pressure and disinfectant residuals to assess operational compliance.

WBS #2 – Port Charlotte Golf Course

The Port Charlotte Golf Course WBS (WBS #2) is in Mid County at 22339 Gleneagle Terrace, Port Charlotte, Florida, 33952. Originally built in 1966, the WBS includes a GST, a high-service pump station (HSPS), NaOCl and $(NH_4)_2SO_4$ chemical injection skids, electrical components, and backup power supply. Table 3-5 summarizes the major components and equipment of this WBS. A site inspection conducted during the *2021 CCU Annual Report* preparation noted that the equipment, site, electrical components, and backup power supply are generally in good-to-excellent condition and no deficiencies were noted.

Table 3-5 Golf Course WBS Facilities Summary

GST Capacity (MG)	HSPs	Chemical Feed Pumps	Chemical Storage Tanks	Backup Power
1.0	Two – 100 hp	Three $(NH_4)_2SO_4$ Three NaOCl	Two 300-gallon $(NH_4)_2SO_4$ Two 900-gallon NaOCl	Diesel Generator

Note: hp = horsepower.

The performance data collected and reported in the 2021 Monthly Operating Reports (MORs) indicate that the WBS is operating as intended by improving chlorine residual and water pressure in the area. Figure 3-4 depicts the effluent chlorine residual data. The WBS is set to maintain an effluent chlorine residual of 4.0 mg/L. In the summer months, influent chlorine residual drops, requiring more chemicals to maintain the target disinfectant concentration. The drop in chlorine residual is a seasonal occurrence due to decreases in water demand and increases in temperature in the distribution system. Figure 3-5 depicts the influent and effluent pressures, showing averages of 55 psi and 80 psi, respectively.

Figure 3-4 Golf Course WBS 2021 Effluent Chlorine Residual

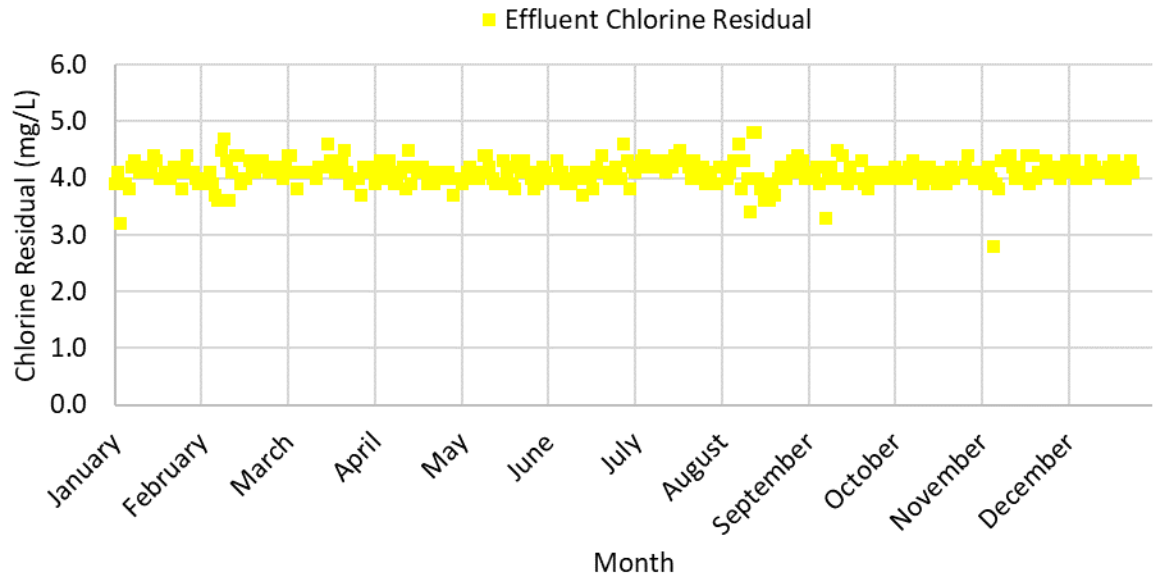
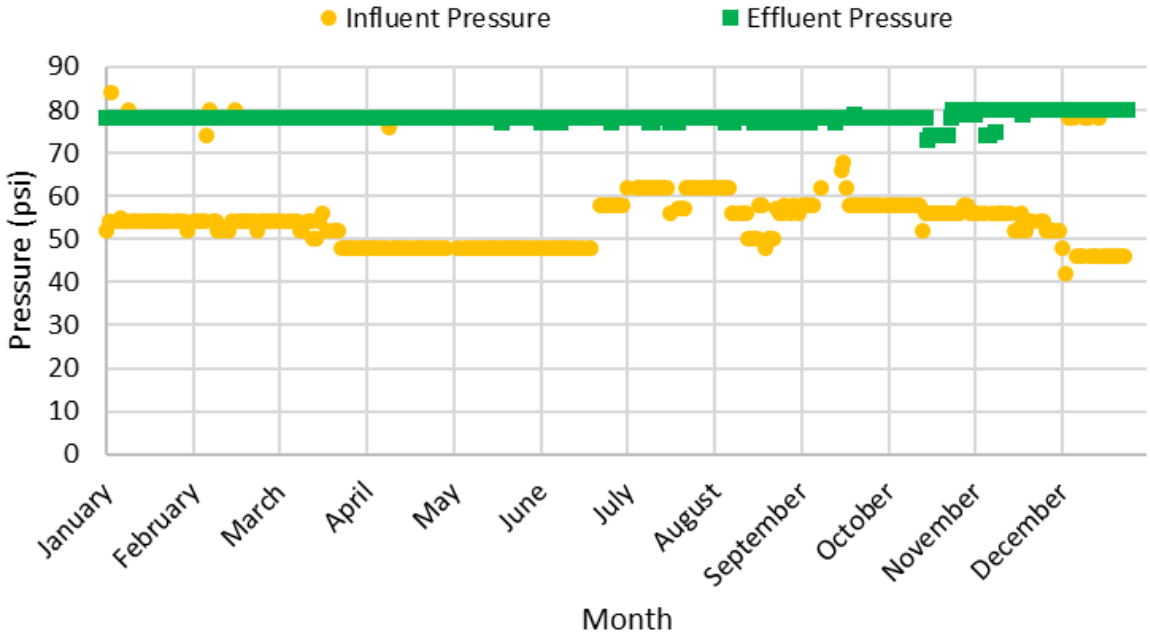


Figure 3-5 Golf Course WBS 2021 Influent and Effluent Pressures



WBS #3 – Gulf Cove

The Gulf Cove WBS (WBS #3) was built in 1980 and is in West County at 12050 Van Lenten Blvd, Port Charlotte, Florida, 33981. It is responsible for boosting and conveying flows from the Myakka River Crossing into the West County service area. Table 3-6 summarizes the WBS facilities, which include a GST, HSPs, NaOCl and $(NH_4)_2SO_4$ chemical injection skids, electrical components, and a backup power supply. As recommended in past years, the *2021 CCU Annual Report* notes that the generator fuel tank is undersized and will be replaced in FY 2023.

Table 3-6 Gulf Cove WBS Facilities Summary

GST Capacity (MG)	HSPs	Chemical Feed Pumps	Chemical Storage Tanks	Backup Power
2.0	One – 50 hp One – 60 hp One – 75 hp One – 100 hp	Two $(NH_4)_2SO_4$ Two NaOCl	Two 300-gallon $(NH_4)_2SO_4$ Two 600-gallon NaOCl	Diesel Generator[1]

[1] The existing fuel tank is undersized and cannot provide 72 hours of operation during storm events, per CCU standards.

Similar to Golf Course WBS, chlorine residuals in May through November decrease due to temperature increases and decreased demand highlighting the need for a disinfection boost in this area. The performance data collected and reported in the 2021 MORs indicate that the chlorine and pressure are effectively boosted year-round. Figure 3-6 depicts the effluent chlorine residual data, and Figure 3-7 depicts the influent and effluent pressures, showing averages of 35 psi and 80 psi, respectively. The Gulf Cove WBS influent pressure is significantly lower than the Golf Course WBS due to its distance away from the Walenda WBS and PRMRWSA interconnects.

Figure 3-6 Gulf Cove WBS 2021 Effluent Chlorine Residual

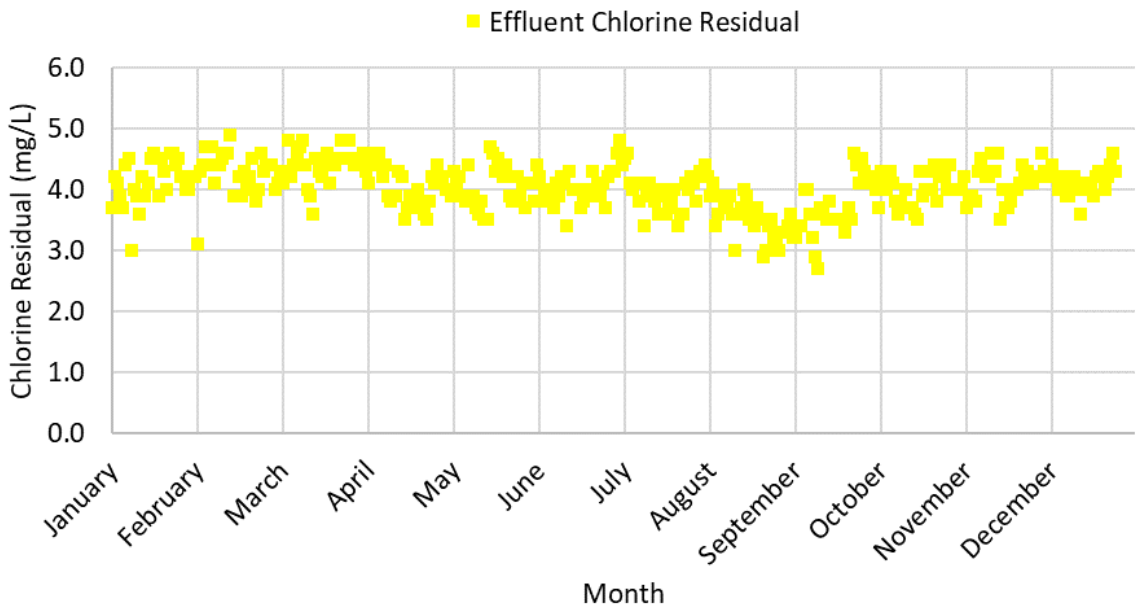
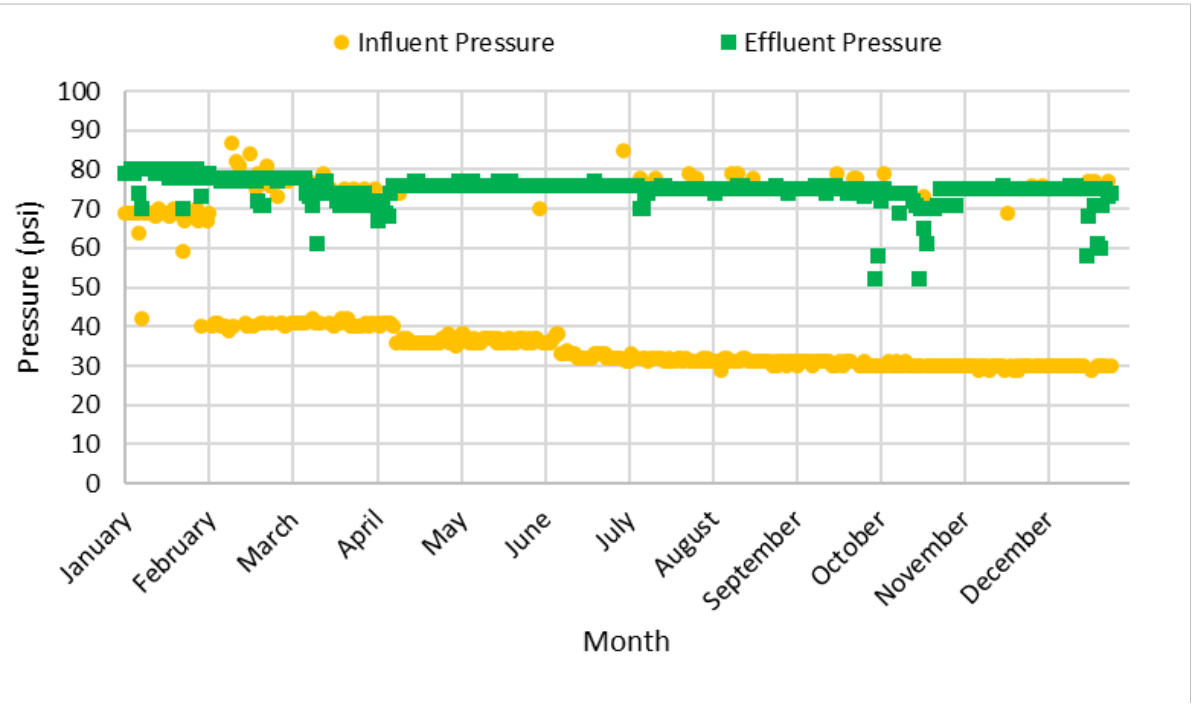


Figure 3-7 Gulf Cove WBS 2021 Influent and Effluent Pressure



WBS #4 – Walenda

The Walenda WBS (WBS #4) is in Mid County at 17177 Walenda Avenue, Port Charlotte, Florida, 33953, and was built in 1994. The Walenda WBS is a critical station that serves the west portion of Mid County and conveys much of the flow to West County. Local data show that the station operates effectively throughout the year. Table 3-7 summarizes the WBS facilities, which include a GST, an HSPS, NaOCl and $(NH_4)_2SO_4$ chemical injection skids, electrical components, and a backup power supply. The *2021 CCU Annual Report* noted that the generator is nearing the end of useful life and is unable to accommodate the existing loads of the facility. The WBS would not be able to function during a power outage. CCU has indicated plans for electrical system upgrades for this WBS including a new Motor Control Center (MCC) and generator to be installed as a CIP in 2022–2023.

Table 3-7 Walenda WBS Facilities Summary

GST Capacity (MG)	HSPs	Chemical Feed Pumps	Chemical Storage Tanks	Backup Power
2.0	Three 75 hp Two 100 hp	Two $(NH_4)_2SO_4$ Two NaOCl	Two 300-gallon $(NH_4)_2SO_4$ Two 1,000-gallon NaOCl	Diesel Generator

The performance data collected and reported in the 2021 MORs appear to indicate that the WBS is operating as intended by improving chlorine residual and water pressure in the area. However, CCU operational staff report that the WBS is not able to meet the total design pumping capacity with all pumps running at maximum capacity. This issue is discussed in detail in Section 7.4.1.5. Figure 3-8 depicts the influent and effluent chlorine residual.

Figure 3-8 Walenda WBS 2021 Effluent Chlorine Residual

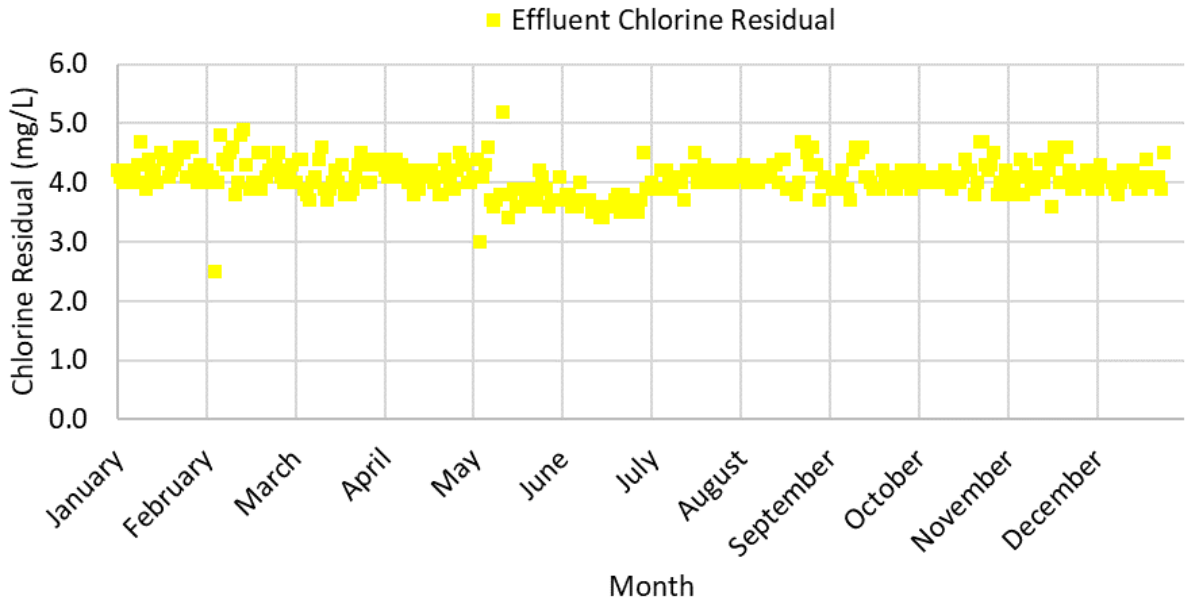
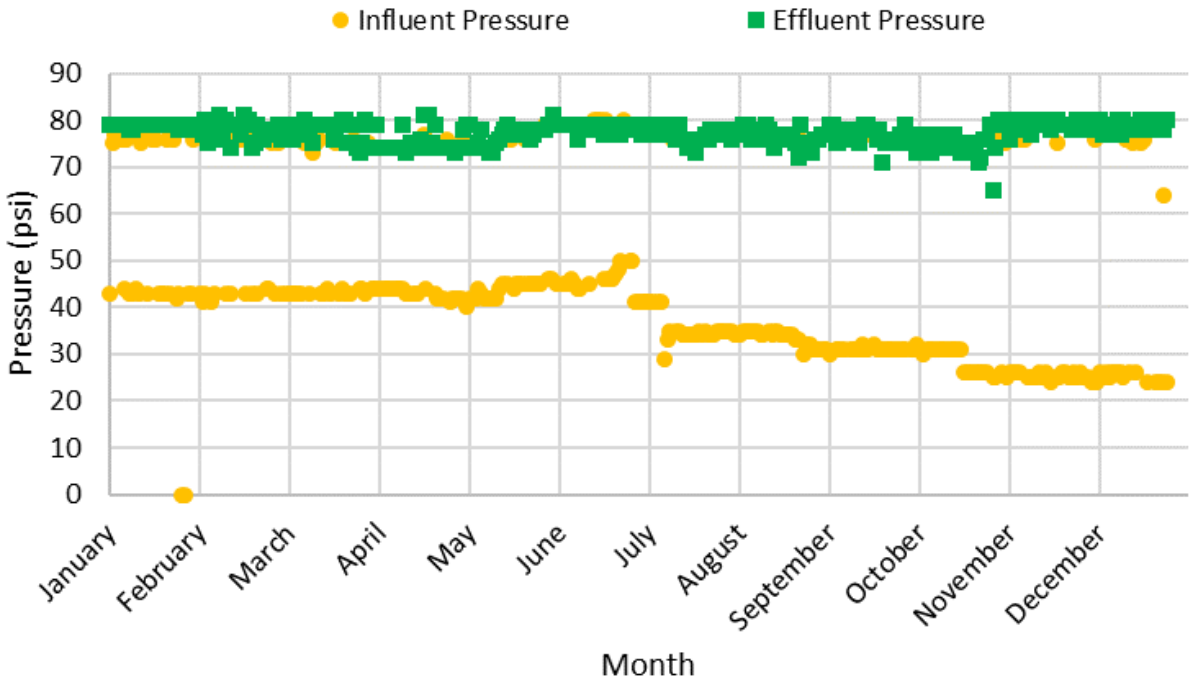


Figure 3-9 depicts the influent and effluent pressures. The influent pressure experienced a distinct stepwise reduction over 2021. These reductions occur during peak season when CCU must lower the backpressure on the fill valve to the GST to convey additional flow to the Rotonda WBS. The influent pressures are also significantly impacted by the PRMRWSA supply, which is primarily provided by the Harborview interconnect. The influent pressures are lower than the Golf Course WBS due to its distance away from the PRMRWSA's interconnect and increasing demands in the area. CCU plans to install and upgrade additional pipelines and pumps to provide an increase in flow and pressure to and from the Walenda WBS. Chapter 7 discusses this in more detail.

Figure 3-9 Walenda WBS 2021 Influent and Effluent Pressure



WBS #6 – Rotonda

The Rotonda WBS (WBS #6) is in West County at 46 Parade Circle, Rotonda, Florida, 33947. It was built in 1973. This WBS does receive flow from a 12-inch water main supplied by Gulf Cove WBS and a 24-inch water main supplied by Walenda WBS. WBS #6 facilities include a GST, HSPs, NaOCl and $(NH_4)_2SO_4$ chemical injection skids, electrical components, and a backup power supply. Table 3-8 summarizes the facility details. The *2021 CCU Annual Report* noted that the station's switchgear is in poor condition and is likely nearing the end of its service life. CCU has indicated plans for electrical system upgrades for this WBS including a new MCC and generator to be installed as a CIP in 2022–2023.

Table 3-8 Rotonda WBS Facilities Summary

GST Capacity (MG)	HSPs	Chemical Feed Pumps	Chemical Storage Tanks	Backup Power
5.0	Two 60 hp Two 100 hp	Two $(NH_4)_2SO_4$ Two NaOCl	Two 300-gallon $(NH_4)_2SO_4$ Two 1,000-gallon NaOCl	Diesel Generator

The performance data collected and reported in the 2021 MORs indicate that the WBS is operating as intended by improving chlorine residual and water pressure in the area. However, operators have noted the pumps are not performing as intended. This issue is discussed in Section 7.4.1.5. Like other WBSs, the station experiences a drop in chlorine residual concentration in the influent during the summer but as seen in Figure 3-10 effectively raises it to around 4.0 mg/L to maintain residuals in the area. Figure 3-11 shows the average influent and effluent pressures to be 28 psi and 72 psi, respectively. The WBS can be supplied water from two water mains. The data depict erratic pressures were recorded for the influent 24-inch line between July and October, which may have been caused by a faulty pressure sensor. CCU is investigating improvements for this WBS, which are discussed in more detail in Chapter 7.

Figure 3-10 Rotonda WBS 2021 Effluent Chlorine Residual

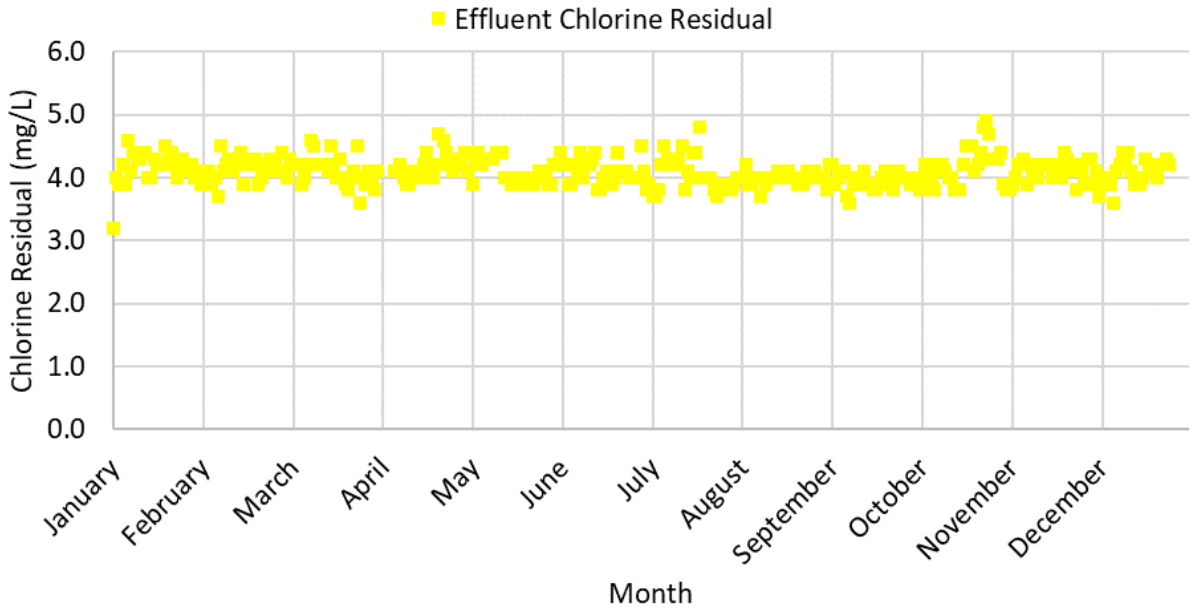
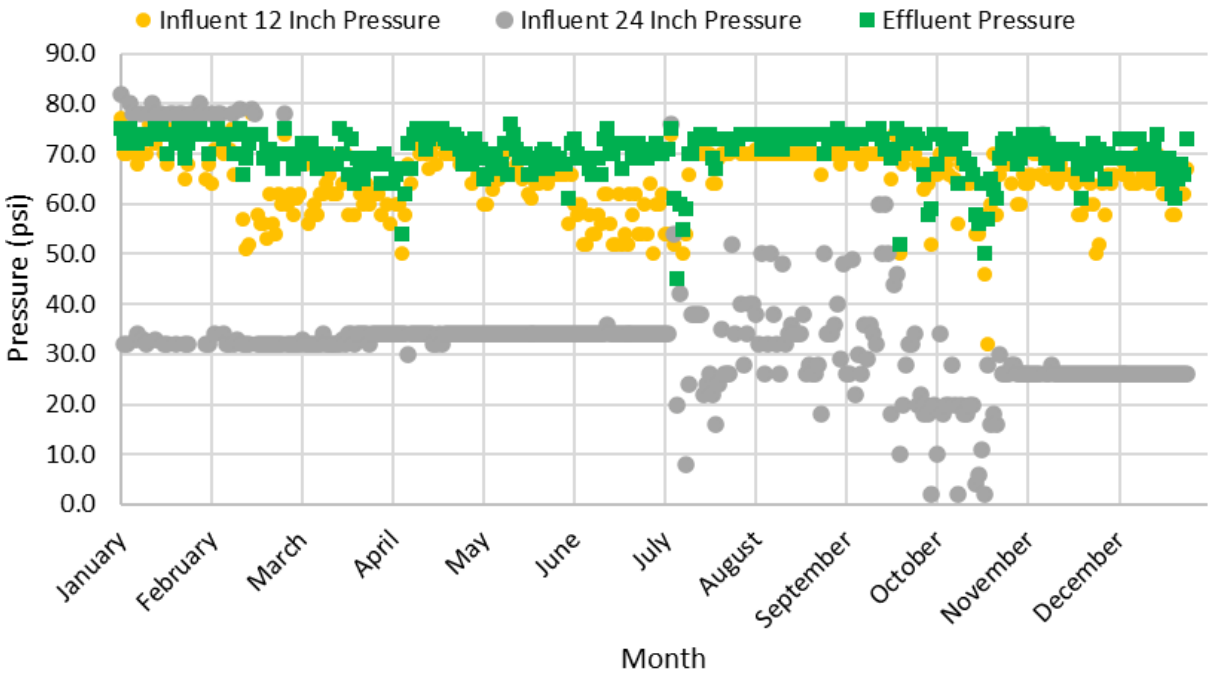


Figure 3-11 Rotonda WBS 2021 Influent and Effluent Pressure



WBS #7 – INGRAHAM

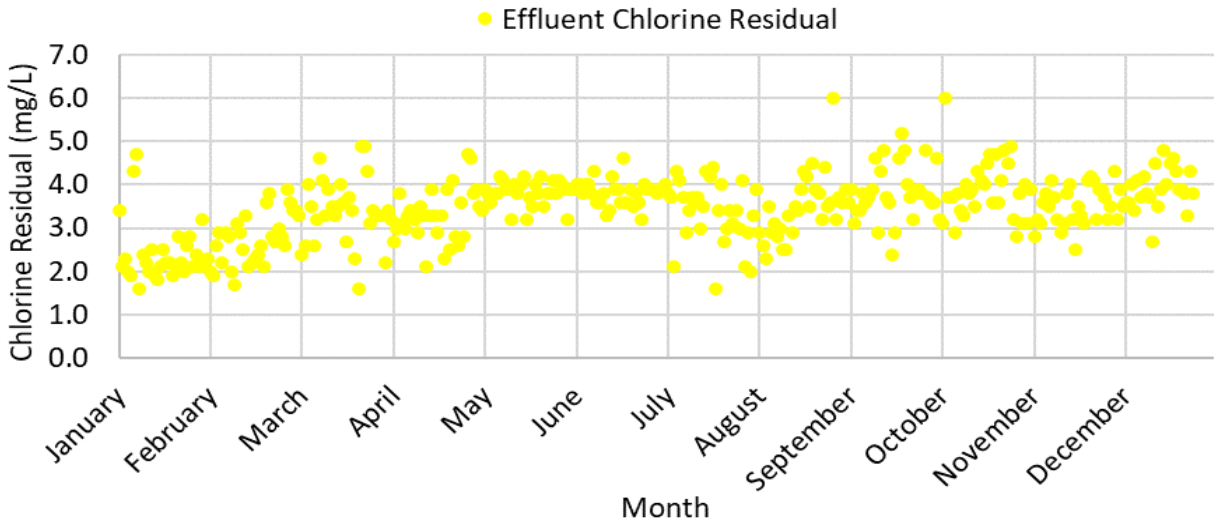
The Ingraham WBS (WBS #7) is at 14276 Ingraham Boulevard, Port Charlotte, Florida, 33981. The station was constructed to monitor and boost chlorine residual in the distribution system and unlike other WBSs does not have pressure boosting capabilities. Table 3-9 summarizes the major components, which include NaOCl and $(NH_4)_2SO_4$ chemical feed pumps and associated storage tanks. The system does not have a dedicated backup power supply but instead relies on an adjacent CCU sewer lift station for backup power.

Table 3-9 Ingraham WBS Facilities Summary

GST Capacity (MG)	HSPs	Chemical Feed Pumps	Chemical Storage Tanks	Backup Power
N/A	N/A	One $(NH_4)_2SO_4$ Two NaOCl	One 100-gallon $(NH_4)_2SO_4$ One 300-gallon NaOCl	At adjacent lift station (877 Inggard)

The performance data collected and reported in the 2021 MORs indicate that the WBS is operating as intended by improving chlorine residual. Figure 3-12 plots the influent and effluent chlorine residual. The data indicate that the WBS is meeting the minimum disinfectant requirements and averaged a concentration of 3.5 mg/L in 2021. The figure shows intermittent spikes in chlorine residual, which are likely due to the fluctuations in water demand in the area which is currently sparsely populated. Additional controls and monitoring should be installed at this station to refine dosing capabilities.

Figure 3-12 Ingraham WBS 2021 Effluent Chlorine Residual



WBS #8 – Englewood

The Englewood WBS (WBS #8) is in West County at 6369 Richledge Street, Englewood, Florida, 34224. This facility serves as a CCU water booster station and an emergency interconnect between CCU and Englewood. Although typically used to circulate water in the west portion of West County, this station can also be used to divert flow between CCU and EWD in either direction. Table 3-10 summarizes the WBS facilities, which include HSPs, electrical components, and a backup power supply. No historical monitoring data is available for this WBS.

Table 3-10 Englewood WBS Facilities Summary

GST Capacity (MG)	HSPs	Backup Power
N/A	Two 40 hp	Diesel Generator

WBS #9 – Myakka

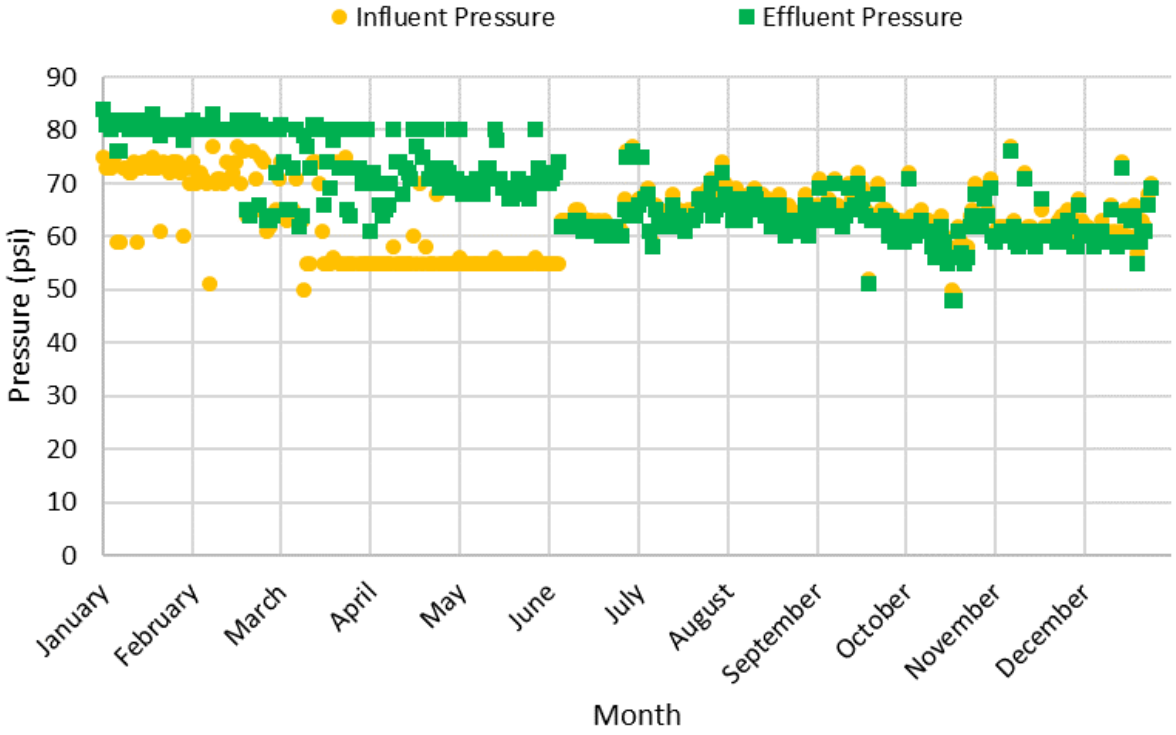
The final WBS in the Port Charlotte Water System is the Myakka WBS (WBS #9) at 4070 Railroad Avenue, Port Charlotte, Florida, 33953. The station was constructed and put in operation in 2021 and shares the site with the El Jobean vacuum sewer station. The WBS facilities include HSPs, NaOCl and $(NH_4)_2SO_4$ chemical injection skids, electrical components, and a backup power supply. The WBS was constructed to increase CCU's ability to convey flow across the Myakka River, which is currently limited by the water main on the Myakka bridge to the Rotonda WBS to meet the West County water demands. Table 3-11 summarizes the facilities.

Table 3-11 Myakka WBS Facilities Summary

GST Capacity (MG)	HSPs	Backup Power
N/A	Three 40 hp	Diesel Generator

Figure 3-13 depicts influent and effluent pressure at the WBS. The performance data collected and reported in the 2021 MORs indicate that the WBS is operating as intended by improving water pressure in the area.

Figure 3-13 Myakka WBS 2021 Influent and Effluent Pressure



3.1.3.3 Fire Protection

As discussed in Section 2.4.2, fire hydrants are another critical component of water distribution systems. CCU has 2,758 fire hydrants in Mid County and 2,393 fire hydrants in West County. Charlotte County must ensure fire hydrants are in place such that fire flow capacity and maximum hydrant spacing are met based on nearby building fire protection requirements. For fire flow, water distribution systems must be capable of adequately supplying a specific flowrate and duration from local hydrants while maintaining a residual system pressure of 20 psi throughout the entire system. Chapter 7 discusses fire flow in more detail. Fire hydrants must also be in certain proximity of each other with respect to the nearest building. As stated earlier, fire protection is a collaborative effort in Charlotte County that includes many considerations; specific fire hydrant requirements, guidelines, and exceptions may be found in Charlotte County Code of Ordinances and/or the FFPC. The CCU Engineering Division general rule of thumb for maximum distance to the nearest hydrant is 750 feet for residential properties and 500 feet for commercial properties.

As part of this report, a spatial analysis was conducted on the CCU distribution systems. Charlotte County GIS was used to determine the location of fire hydrants and SWFWMD parcel data were used to filter *residential* and *commercial* properties. For this analysis, *residential* included single-family, duplex, small-scale multi-family, mobile home, and mobile home park (MHP) properties; *commercial* included condominium/apartment, large-scale multi-family, commercial, industrial, and institutional properties. The purpose of the analysis was to identify potential fire hydrant deficient areas that can be further reviewed to

ensure adequate fire protection is being provided. Figure 3-14 and Figure 3-15 illustrate the results of the fire hydrant spatial analysis for Mid and West County, respectively. For reference, Appendix B provides a complete list of the property addresses.

Figure 3-14 Mid County Fire Hydrant Spatial Analysis Results

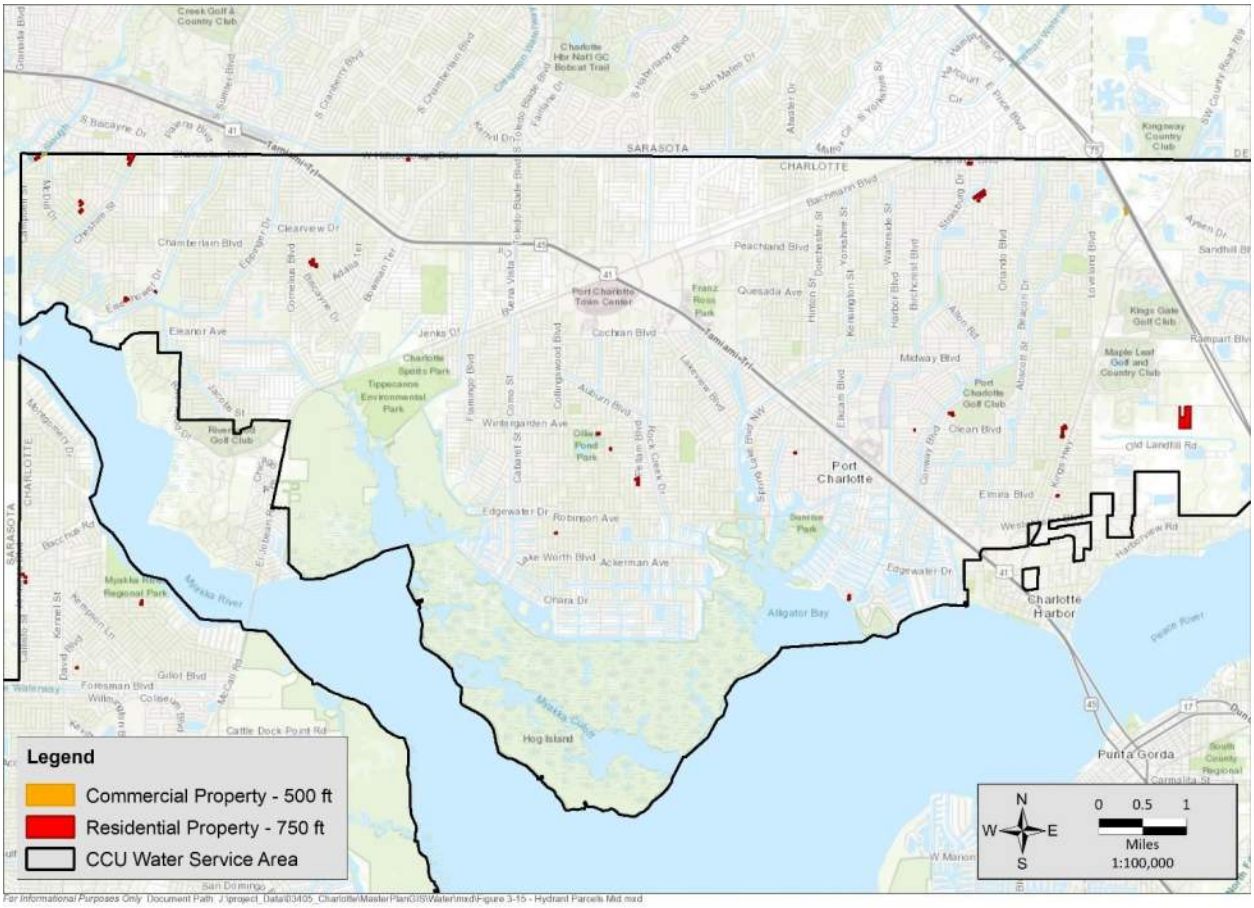
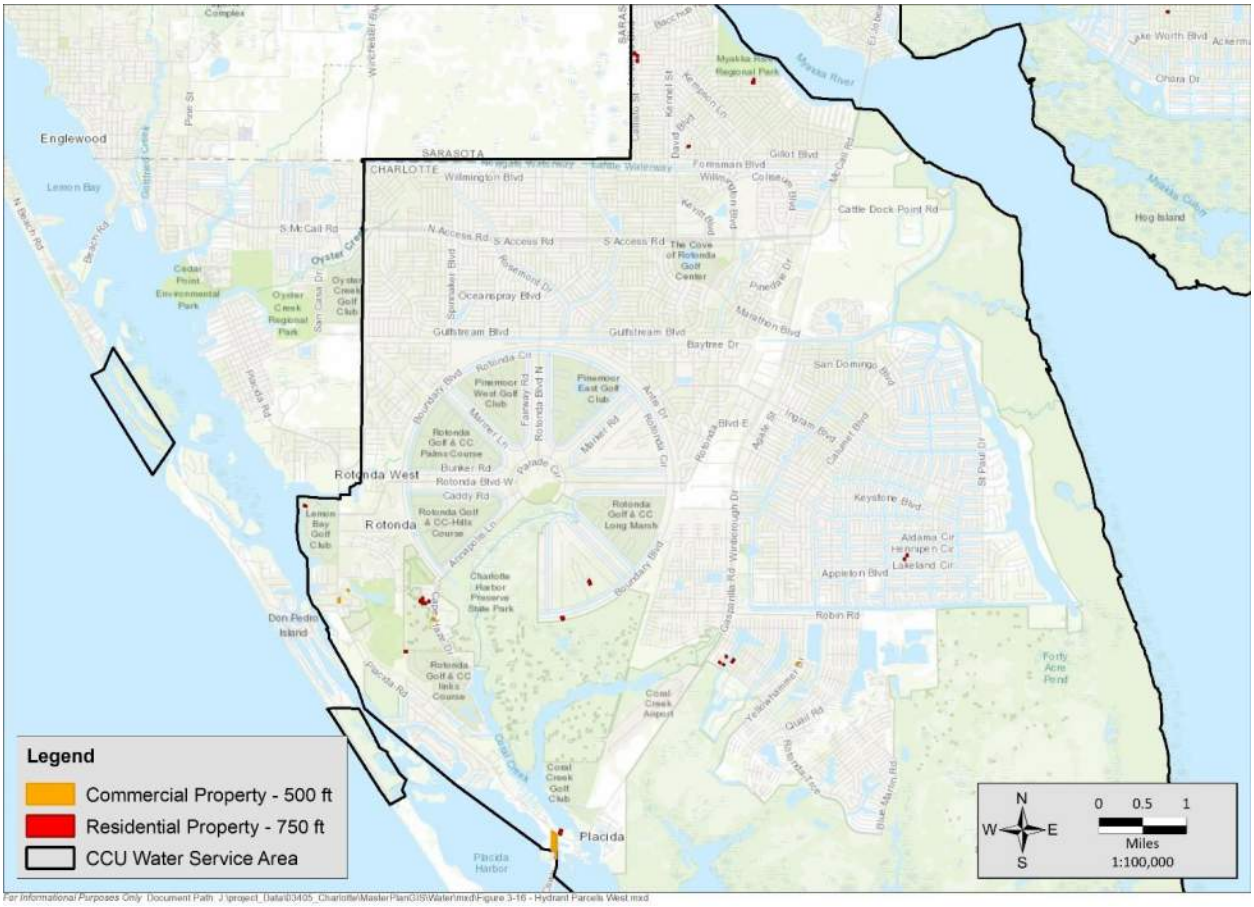


Figure 3-15 West County Fire Hydrant Spatial Analysis Results



3.1.4 PORT CHARLOTTE WATER SYSTEM RECOMMENDATIONS

The Port Charlotte Water System recommendations compiled from this section and from the condition assessments completed for the *2021 CCU Annual Report* include:

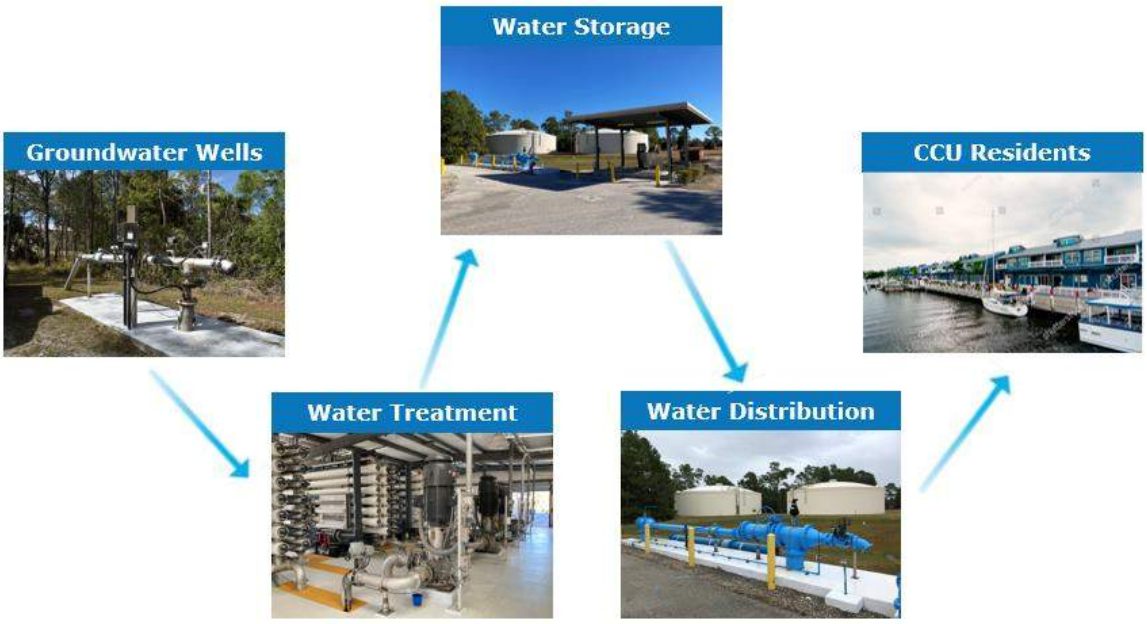
- Replace concrete-encased pipe at Gulf Cove WBS #3 connecting the GST and pumping building.
- Upgrade the electrical components and upsize the generator and fuel tank at Gulf Cove WBS #3 to ensure that it can properly function during a power outage.
- Replace the generator at Walenda WBS #4 with a properly sized generator to accommodate the loads and maintain reliable operation for future expansion of the station. Upsize Walenda WBS #4 pumping capacity (replace smaller pumps with one 100-hp and two 150-hp pumps), electrical, generator, and discharge piping.
- Upsize Rotonda WBS #6 pumping capacity (replace smaller pumps with two 150-hp pumps), electrical, and generator. Replace the switchgear at Rotonda WBS #6 since it is nearing the end of its useful life.
  Continue installing new hydrants for 87 residential property and 40 commercial property areas to meet CCU fire protection standards.

Section 7.4.1 discusses additional recommendations for improvements to the Port Charlotte Water System facilities based on the hydraulic modeling results.

3.2 South County – Burnt Store Water System

CCU also owns, operates, and maintains the water supply and water distribution facilities in South County. The facility is officially called the Burnt Store PWS (PWS ID6080318), commonly called the Burnt Store Water System, and water is provided from CCU's Burnt Store RO WTP. The Burnt Store Water System consists of six groundwater wells, the Burnt Store WTP, water storage, and the distribution system. Due to its current size, the Burnt Store Water System does not require WBSs to convey drinking water to users. Figure 3-16 illustrates the water path from source to customer for the Burnt Store Water System.

Figure 3-16 Burnt Store Water System Overview



3.2.1 Burnt Store Water System Source Water Supply

Water supply withdrawals are permitted from the Burnt Store Wellfield under a 20-year WUP (#3522), expiring September 25, 2033. CCU is permitted to withdraw a total quantity of 3.172 MGD AADF or 4.117 MGD PMF. However, only seven groundwater wells have been installed and six are currently in operation, which limits the available withdrawal flows to 1.702 MGD AADF and 2.231 MGD PMF. Table 3-12 summarizes each well's characteristics and permitted withdrawals. In total, the current wells are pumping slightly over one-half of the permitted allowance with one well (RO-15) out of service due to saltwater intrusion. Wells 14 and 17 through 19 are currently permitted but not constructed.

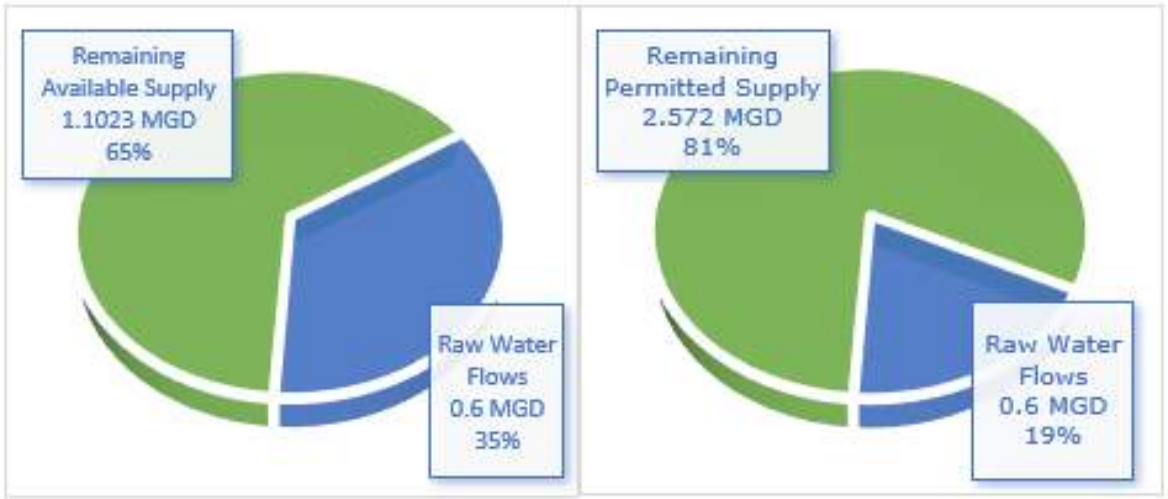
Table 3-12 Burnt Store RO WTP Permitted Water Supply

Well ID No.	Status	Diameter (inches)	Depth Total/Cased (feet-bls)	Permit Limit, Average (gpd)	Permit Limit, Peak Month (gpd)
RO-7	Current	8	600/300	200,000	272,000
RO-8	Current	8	595/304	200,000	272,000
RO-9	Current	8	642/550	200,000	272,000
RO-11	Current	12	650/526	367,500	471,700
RO-12	Current	12	470/412	367,400	471,700
RO-14	Future	12	650/300	367,400	471,700
RO-15	Not in service	12	1,050/805	—	—
RO-16	Current	12	608/324	367,400	471,800
RO-17	Future	12	650/450	367,500	471,700
RO-18	Future	12	650/450	367,400	471,700
RO-19	Future	12	650/450	367,400	471,700
CURRENTLY AVAILABLE[1]		**1,702,300**		**2,231,200**	
TOTAL AVAILABLE[2]		**3,172,000**		**4,118,000**	

Notes: gpd=gallons per day; bls=below land surface.
[1]Represents current well production.
[2]Assumes all current and future status wells are operational.

Figure 3-17 shows that the current raw water flows are approximately 0.60 MGD AADF, which represents nearly 19 percent of the CCU's SWFWMD-permitted supply and 35 percent of the currently available supply. The permitted supply varies from the current supply as CCU only has six wells constructed and in operation. In addition, the Burnt Store RO WTP is further restricted by the water treatment process limitation and can only produce 80 percent of the raw water flow. This is discussed in further detail in the following sections.

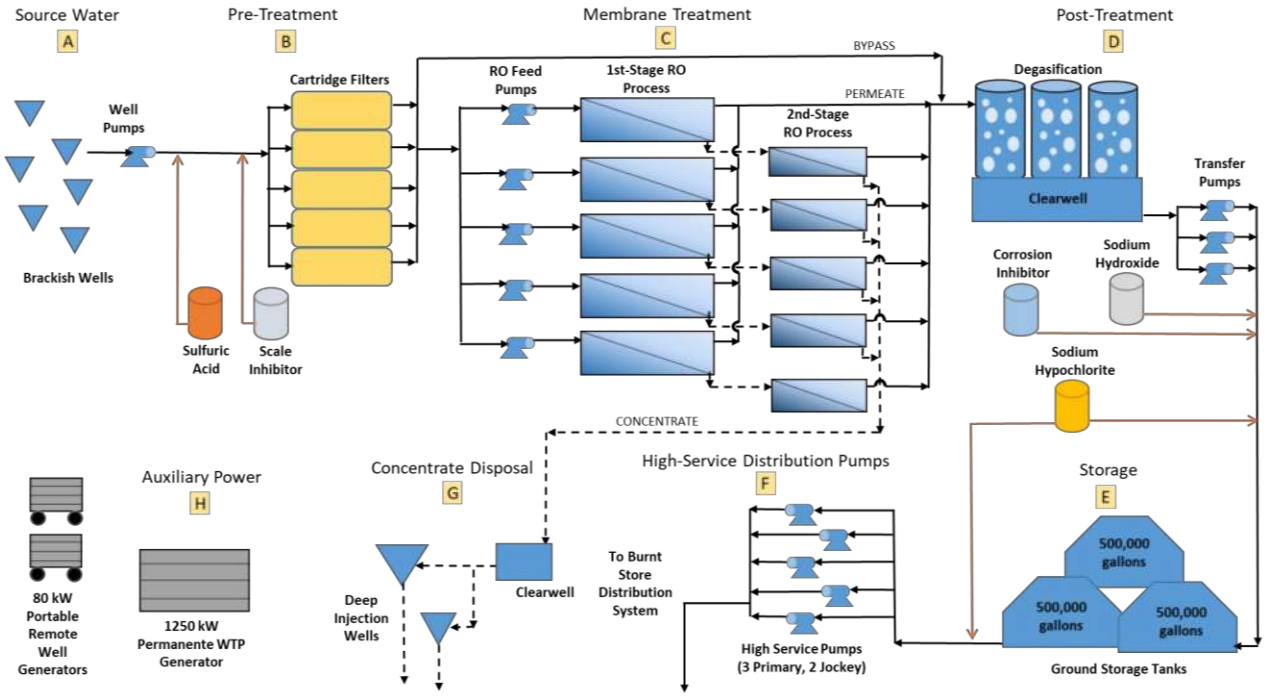
Figure 3-17 Available and Permitted Water Supply from the Burnt Store Wellfield



3.2.2 BURNT STORE WATER TREATMENT PLANT

The Burnt Store RO WTP treats groundwater through the RO process and serves as CCU's sole WTP. It is at 17430 Burnt Store Road in Punta Gorda, Florida, 33982. The WTP was expanded in 2009 and has a permitted maximum day operating capacity of 3.61 MGD. Figure 3-18 represents the process flow of the WTP from raw water wells to the distribution system. Source water (A) is extracted and pumped to the head of the WTP process where it undergoes pre-treatment (B). These processes prepare the water for treatment through the RO membrane filters (C) and protect the membranes from plugging and scaling. The filtered water is combined with bypass water before entering post-treatment (D). This involves degasification, pH adjustment, and chemical dosing to meet drinking water quality standards. The drinking water is then stored (E) before distribution across South County by the HSPS (F). More information on these steps as well as concentrate disposal (G) and auxiliary power (H) are described herein.

Figure 3-18 Burnt Store RO WTP Process Flow Diagram



A) Source Water

The groundwater wells that feed the WTP draw brackish water from the Hawthorn aquifer. The raw water is conveyed to the WTP by six submersible pumps, one pump per well. The pumps typically operate at low-pressure conditions and are used to convey water through the downstream cartridge filters before the membrane process. CCU also operates 12 monitoring wells around the well sites that are used to monitor groundwater drawdown, recovery, and various water-quality parameters.

B) Pre-Treatment Process

The chemical feed systems required in the pretreatment step of the RO membrane process include the addition of acid and scale inhibitor. The sulfuric acid feed system includes bulk and day storage tanks and a chemical feed skid equipped with multiple chemical-feed

pumps. The scale inhibitor system includes a chemical feed skid with redundant feed pumps that draw chemicals directly from the manufacturer-provided storage containers. CCU uses a combination of sulfuric acid and scale inhibitors to maximize recovery and prevent membrane scaling. The dosed water is then passed through one of five cartridge filter vessels that operate in parallel. Cartridge filters are static sieving filters used to prevent biological fouling and plugging of the RO membranes and protect against sand entrainment from well pumping. CCU uses 40-inch string-wound polypropylene cartridges with a 1-micron pore size. The cartridges are housed in vertical stainless-steel vessels and are replaced every 6 months based on raw water quality, turbidity, and total suspended solids (TSS).

C) Membrane Treatment Process

RO membranes are pressure driven and require immense force, between 120 and 160 psi to push the pre-treated water through the system. High-pressure (greater than 60 psi) feed pumps are required to convey water through the RO membranes and post-treatment processes. Burnt Store WTP uses spiral-wound membranes, and each RO train/array has a designated vertical turbine feed pump for providing flow and meeting pressure requirements. The Burnt Store WTP has five RO high-pressure feed pumps that feed two 2-Stage RO Trains (500,000-gpd capacity each) and three 2-Stage RO Trains (750,000-gpd capacity each). The membranes have exceeded their expected lifespan but are reported to be maintaining decent production. In 2021, minor leaks were reported to occur in some of the process piping.

The membrane treatment process results in a permeate and concentrate stream. In many membrane systems, a portion of water bypasses the RO process and blends with the permeate stream to meet the target hardness concentrations and increase mineral content. At the Burnt Store WTP, the bypass water is passed through cartridge filters for TSS and turbidity removal and reintroduced to the permeate stream before degasification. The blending ratio for the bypass stream is maintained between 9 and 10 percent. Recovery is often expressed as a percentage and can be calculated for an individual process, system, or the entire plant. The permeate recovery (ratio of permeate to raw water) is 71 percent and the WTP recovery (ratio of finished water to raw water) is 80 percent based on historical data.

D) Post-Treatment Process

Post-treatment is a critical final step in producing quality drinking water. The quality of the water exiting the RO membranes is corrosive because it has been stripped of nearly all beneficial minerals. Therefore, the RO membrane-treated water is blended with the water that was bypassed after the cartridge filters before proceeding to the aeration step. The Burnt Store RO WTP uses three packed-tower degasifiers above the 16,000-gallon clearwell. Each degasification tower is equipped with a blower that conveys ambient air into the tower media for the simultaneous removal of hydrogen sulfide (H_2S) and carbon dioxide (CO_2) and addition of oxygen into the water. The condition of the media is unknown, but the system is effective, and the blowers are functioning. After degasification, the water is pumped by three transfer pumps to storage and is dosed with sodium hydroxide for pH adjustment, zinc orthophosphate as a corrosion inhibitor, and sodium hypochlorite for primary disinfection.

Each chemical has its own individual containment area and pump skid within the process building. Pump skids typically include two chemical-feed pumps for redundancy.

E) Storage

The final step before distribution is storage. The Burnt Store RO WTP contains three GSTs, each with a capacity of 500,000 gallons (1.5 MG total). The GSTs are made of concrete and are designed such that stored water does not stay stagnant for extended time. GSTs are typically sized to meet the maximum day conditions of the system and based on the current flows the existing storage is sufficient. Tank inspections are completed every 3 years and reported to be in good condition.

Sodium hypochlorite is also sometimes added downstream of the GSTs to boost the residual before the water is sent to the customers. Unlike the Port Charlotte Water System, the Burnt Store RO WTP currently uses chlorine as its secondary disinfectant and therefore must maintain a disinfectant residual between 0.2 and 4.0 mg/L. Water-quality results are discussed in detail in Chapter 8, but since little chlorine decay occurs in the Burnt Store RO WTP distribution system, CCU targets a residual concentration of 1.5 mg/L at the point of entry.

F) Distribution High-Service Pumps

The finished water is conveyed to South County residents via an HSPS including three 125-hp duty pumps, one 25-hp jockey pump, and one 25-hp standby jockey pump. Two pumps are regularly used when demand is average, and a third will automatically start pumping if demands are high such as in the morning and the evening. Two pumps are held in reserve if the main pumps are under repair or need to be replaced. This allows the Burnt Store RO WTP to provide continuous service to South County.

G) Concentrate Disposal

Water that does not permeate the RO membranes is highly concentrated with the contaminants that were removed from the permeate. This reject water contains high concentrations of minerals and salts because the source water is brackish. Burnt Store disposes of this concentrate and waste sampling streams using two deep injection wells (IW-1 and IW-2) that are shared with the Burnt Store WRF. As such, the flow limitations must consider concentrate disposal and reclaimed water disposal quantities and the reliability for each system. The maximum capacity of IW-1 is 0.564 MGD at a maximum rate of 392 gallons per minute (gpm). The maximum capacity of IW-2 is 2.88 MGD at a maximum rate of 2,000 gpm. As of 2021, the wells were operating at 5.23 percent of the rated capacity with average concentrate and reclaimed water disposal flows totaling 0.18 MGD. Approximately 66 percent of the total IW disposal flows were from the RO WTP concentrate and waste streams. The groundwater quality is monitored around the wells by a single dual-level deep monitoring well.

H) Auxiliary Power

Power must constantly be maintained at the location even if regional power is disrupted. One 1,250-kW generator and two 80-kW portable generators are kept at the WTP in the event of a power outage.

3.2.3 Burnt Store Water System

3.2.3.1 Interconnects

Currently, the Burnt Store Water System does not contain any supply interconnects or emergency interconnects. The County has been planning an interconnect with the City of Punta Gorda to increase the resilience of the Burnt Store Water System. The interconnect would be used for emergency purposes.

3.2.3.2 Water Booster Stations

Currently, the Burnt Store Water System does not contain a WBS within the distribution system. System pressures are provided from the HSPS at the Burnt Store RO WTP.

3.2.3.3 Fire Protection

The Burnt Store Water System contains 408 fire hydrants. A similar spatial analysis was completed as described in Section 3.1.3.3 and shows no deficiencies within the currently served areas.

3.2.4 Burnt Store Water System Recommendations

The Burnt Store Water System recommendations compiled from this section and from the condition assessments completed for the *2021 CCU Annual Report* include:

- Determine the ultimate use and/or replacement of Well #15.
- Monitor performance and budget for the replacement of the RO membranes.
- Replace multiple end caps that are leaking on Trains C and D.
- Continue to replace old "class" PVC pipe in the distribution system with new C-900 PVC pipe.
- Identify options to increase resilience of the Burnt Store Water System considering interconnects with neighboring utilities or alternative water supplies.

Additional recommendations for improvements to the Burnt Store Water System based on hydraulic modeling results are discussed in Chapter 7.

4. WATER SYSTEM EXPANSION, PROJECTED DEMANDS, AND CAPACITY CONSIDERATIONS

OVERVIEW

The current water infrastructure discussed in Chapter 3 is used to provide potable water within CCU's service area. As population continues to grow in Charlotte County, expanding the CCU water systems will be necessary to meet future water demands. Water demand projections must consider economic, social, and political factors including infill growth, new developments, and potential utility acquisitions.

This chapter discusses available GIS data related to the County's water service, presents the methodology used to estimate future population and water demands, and provides water demand projections through 2045. Chapter 4 concludes with a review of CCU's existing water supply and treatment capacities and presents a timeline for upgrading water service infrastructure to meet future demand projections.

4.1 CCU GIS DATA

The County tracks and manages water service assets using GIS data. CCU has developed the *Charlotte County Utilities Map Book*, which is an online portal for spatially displaying the County's water, wastewater, and reclaimed water infrastructure. The *Map Book* can display information related to water service including certificated water areas, water meters, service connections, hydrants, valves, vertical network infrastructure, water mains, and sample points. The *Map Book* can display location information such as subdivision, subsection, block number, lot number, section, township, range, and tract.

As part of this project, Jones Edmunds developed additional GIS layers that represent areas under SWFWMD and SFWMD jurisdiction, areas with and without water service, and development zones. Development zones consist of a group of lots or parcels and were originally established for the *2017 Sewer Master Plan* (Jones Edmunds, 2017) based on the sewer collection basins, geographical limitations, and tract size. The development zones were updated for this Master Plan based on new planned developments to spatially account for water demands and wastewater flows within each development zone. Figure 4-1 and Figure 4-2 display the development zones for the Mid, West, and South County service areas. The naming convention for each zone has changed across different consultant projects but should be revisited in the future to create a standardized approach.

As Charlotte County continues to grow and new developments are implemented, the County and its consultants intend to update the database by refining development zone boundaries based on land zoning, new developments, septic-to-sewer conversion projects, and changes in utility infrastructure. This database is one of the modernization tools CCU uses to obtain consistent water demand, wastewater flows, and reclaimed water estimates throughout each CCU master plan. It is also intended to support consistent CIP planning related to water transmission and distribution mains, sewer force mains, sewer collection systems

(vacuum, low-pressure, and gravity), pump station placement and upgrades, and water treatment and WRF improvements. CCU should continue to maintain and update this tool to promote consistency through master planning efforts, O&M, and billing services.

Figure 4-1 Mid County Development Zones

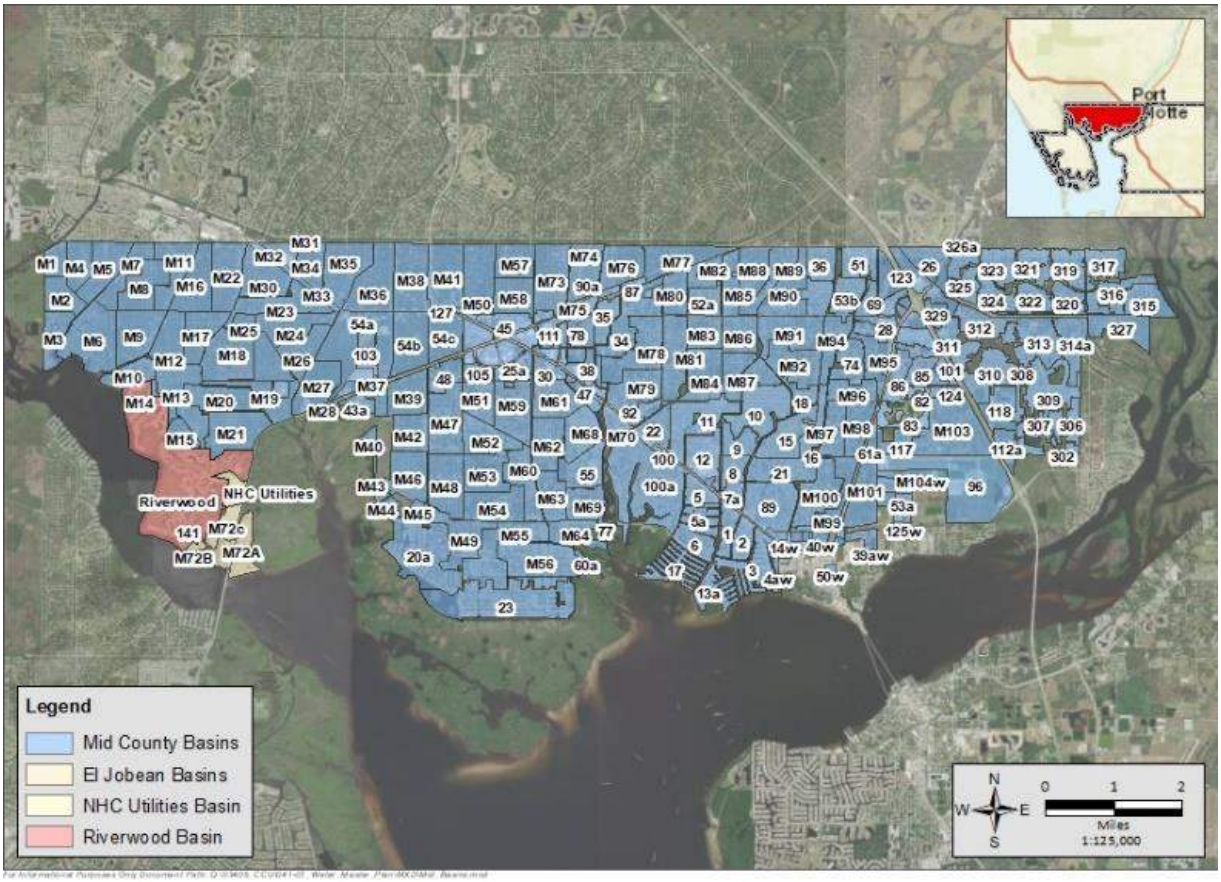
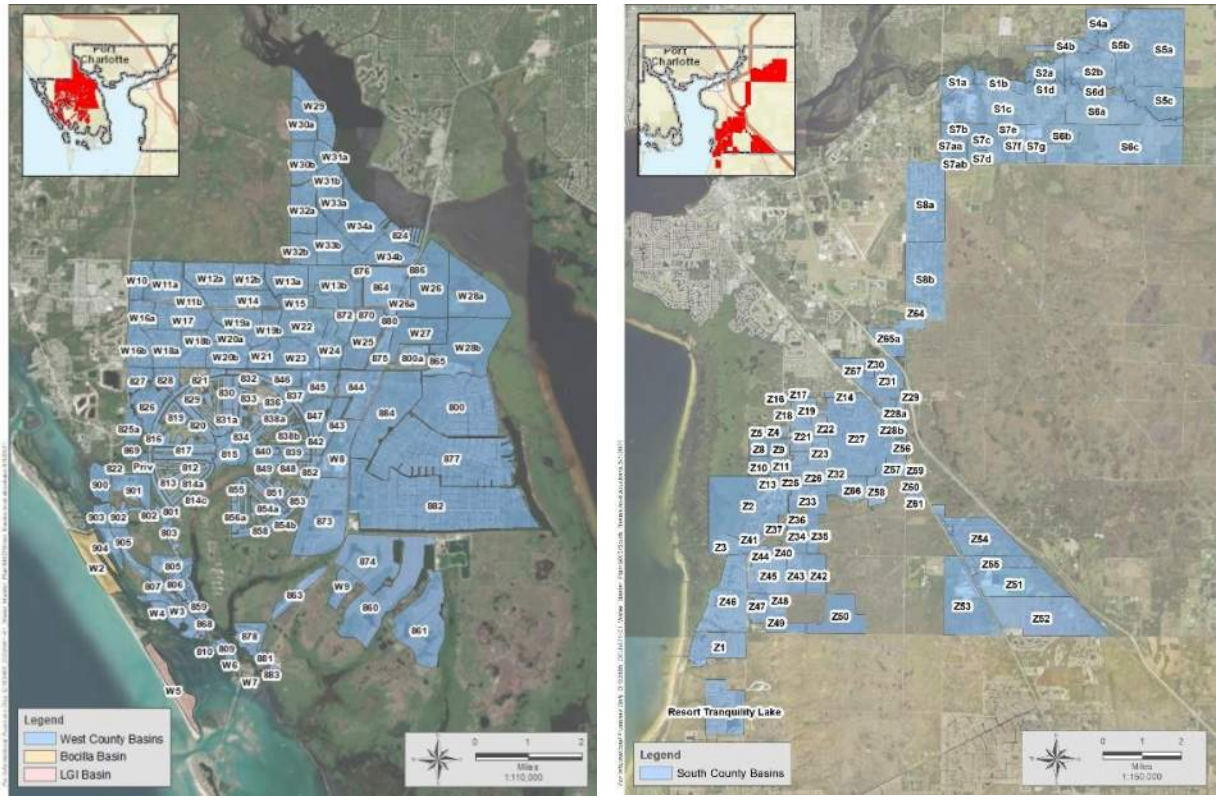


Figure 4-2 West and South County Development Zones



4.2 Population and Demand Projection Methodology

Population estimates are used for a variety of budgeting, planning, and analytical purposes in the public and private sectors. Several federal and state agencies conduct extensive research to produce accurate population estimates. The US Census Bureau develops population projections using various methods such as component II, ratio-correlation, and administrative records. In Florida, SWFWMD produces small-area population projections in support of water supply planning and water use permitting. Since SWFWMD is the primary agency for issuing WUPs in Charlotte County, their population estimates were used as the starting point for this effort.

SWFWMD uses The Geospatial Small-Area Population Forecasting (GSAPF) Model (SWFWMD, 2021a), which uses US Census Cohort projections at the 2010 Census Tract level and spatially distributes the projections to individual land parcels (commonly called lots). The SWFWMD projections include sub-models for predicting population at build-out for each County. The sub-models are composed of multiple GIS data elements including parcel data from each county property appraiser's GIS database, 2010 US Census count data, SWFWMD wetland data, local government future land use maps, and large planned developments for each county (SWFWMD, 2021a). SWFWMD collects data from the counties periodically and updates their projections on a 5-year cycle. However, many areas in Florida are known to experience significant population growth within this timeframe, which is often not included in the most recent SWFWMD projections. Accordingly, although SWFWMD projections were used to define a baseline population growth for this effort, the baseline growth projections were subsequently adjusted to account for other local social, political, and economic factors.

For the *2017 Sewer Master Plan*, Jones Edmunds and the County estimated wastewater flows using SWFWMD's 2015 baseline population projections, which were then updated to reflect 2017 population conditions and extrapolated to establish 5-, 10-, and 15-year projections using the Bureau of Economic and Business Research (BEBR) growth data. A substantial effort was conducted to validate the results of the 2017 projections including spatial confirmation of dwelling units (DUs) and occupied parcels, independent reviews of commercial square footage, and updates to build-out conditions for new planned developments.

Given the detailed level of information used to develop the 2017 projections, the 2017 population, DUs, and non-residential indoor (NRI) square footage (SF) projections were used as the basis of the projections for this effort. As part of this effort, the 2017 projections were updated with 2020 BEBR growth ratios, data from the *Charlotte County 2050 Comprehensive Plan and Charlotte County Burnt Store Roadway Phase 2 – Utility Design*, and the new planned developments discussed in Section 4.2.2. The resulting population data were validated through comparison to the 2020 SWFWMD projections and a study completed by the University of Michigan.

The total projected water demands were then determined using the population projections, average people per household (PPH), DUs or equivalent residential connection (ERC), NRI SF, and an established LOS. According to 2010 Census data, the persons-per-household count in the development zones ranged from 0.11 to 3.25. The *Charlotte County 2050 Comprehensive Plan* assumes an average of 2.14 PPH. Since more families are expected to take up residence in this area in the future, Jones Edmunds assumed an average of 2.5 PPH for planning purposes. This value is consistent with planning values used in the Charlotte County *2017 Sewer Master Plan*. The LOS was established in the *Charlotte County 2050 Comprehensive Plan* as 225 gpd per ERC. The average PPH and LOS were used to calculate the water demand originating from residential customers. The total water demands were calculated by the sum of the current and future potential residential and non-residential (commercial, retail, and industrial) potable water customers. Water demand for non-residential customers was calculated from building SF using 120 gpd per 1,000 SF of non-residential development as historically used in the *Burnt Store Roadway Phase II – Utility Design Technical Memorandum* and *2017 Sewer Master Plan*.

To establish spatially accurate water demands projections, CCU must also consider the location and type of population growth occurring within its service area. Accordingly, parcel data were reviewed to identify and exclude from the projection areas where infill growth will not contribute to water demands in the planning period (Section 4.2.1) and to adjust water-demand estimates for areas with new planned developments (Section 4.2.2). Lastly, Jones Edmunds investigated the potential acquisition of other utilities as part of this effort (Section 4.2.3).

4.2.1 Infill Growth

Broadly, infill growth refers to growth that occurs in unused or underused land, typically in an urban setting. Platted and non-platted lands have a large impact on CCU's infill growth and water system expansion efforts. Platted land (or plats) refers to a tract or parcel of land that has been subdivided into lots of less than 5 acres for the purpose of building commercial or residential developments. Platted development more commonly experiences

infill growth since vacant lots in platted developments usually have roads, power, and water service at or near the vacant lots. For this effort, Jones Edmunds assessed the applicability of parcel-level population projections by spatially reviewing platted and non-platted land areas in relation to CCU's existing distribution system network. Figure 4-3, Figure 4-4, and Figure 4-5 depict the platted and non-platted areas without water service in Mid, West, and South Counties, respectively.

As seen from the figures, a robust network of distribution piping exists in the central part of Mid County and the majority of West County. Some portions of Mid County and West County contain plats that currently have distribution mains in the area but do not have a dense distribution system network. Conversely, a significant portion of South County contains non-platted land where no water service or distribution mains are nearby. The figures also depict the areas where major new developments are currently in the planning or construction phase (in development) and will result in expansion of the distribution systems.

Figure 4-3 Mid County Areas with Potable Water Service

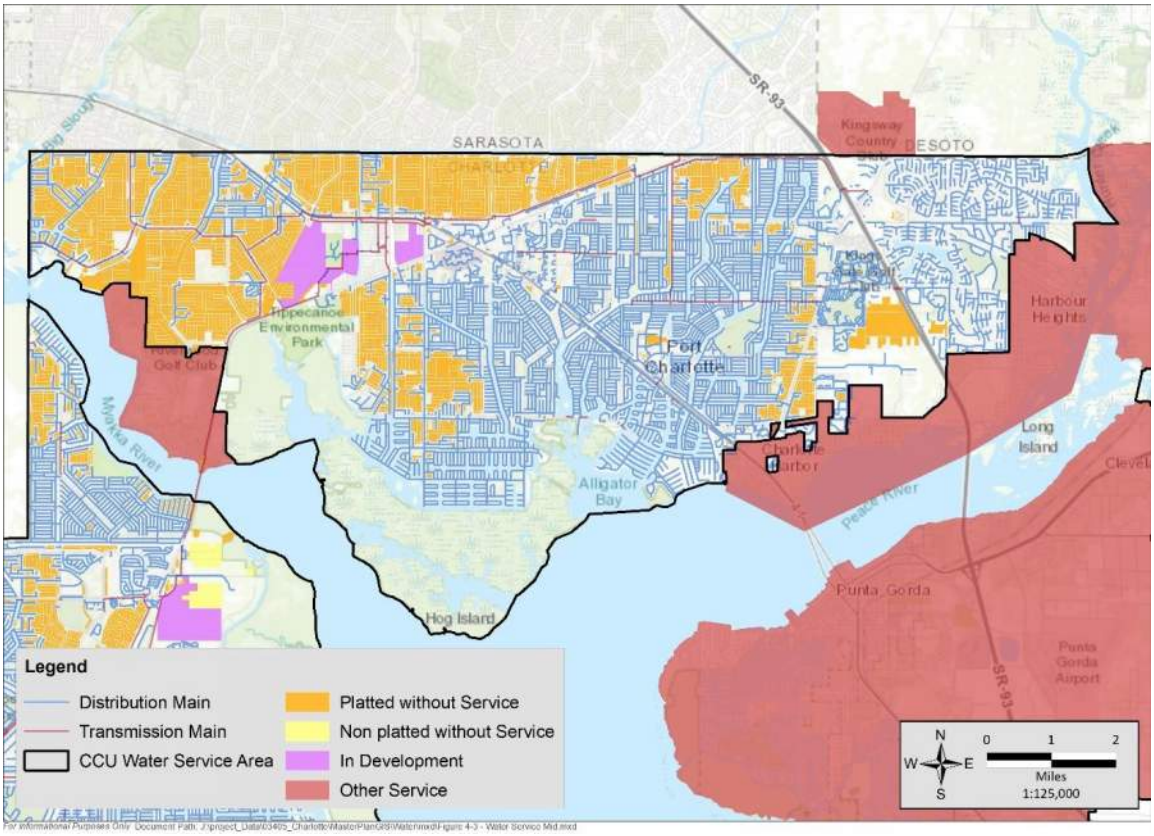


Figure 4-4 West County Areas with Potable Water Service

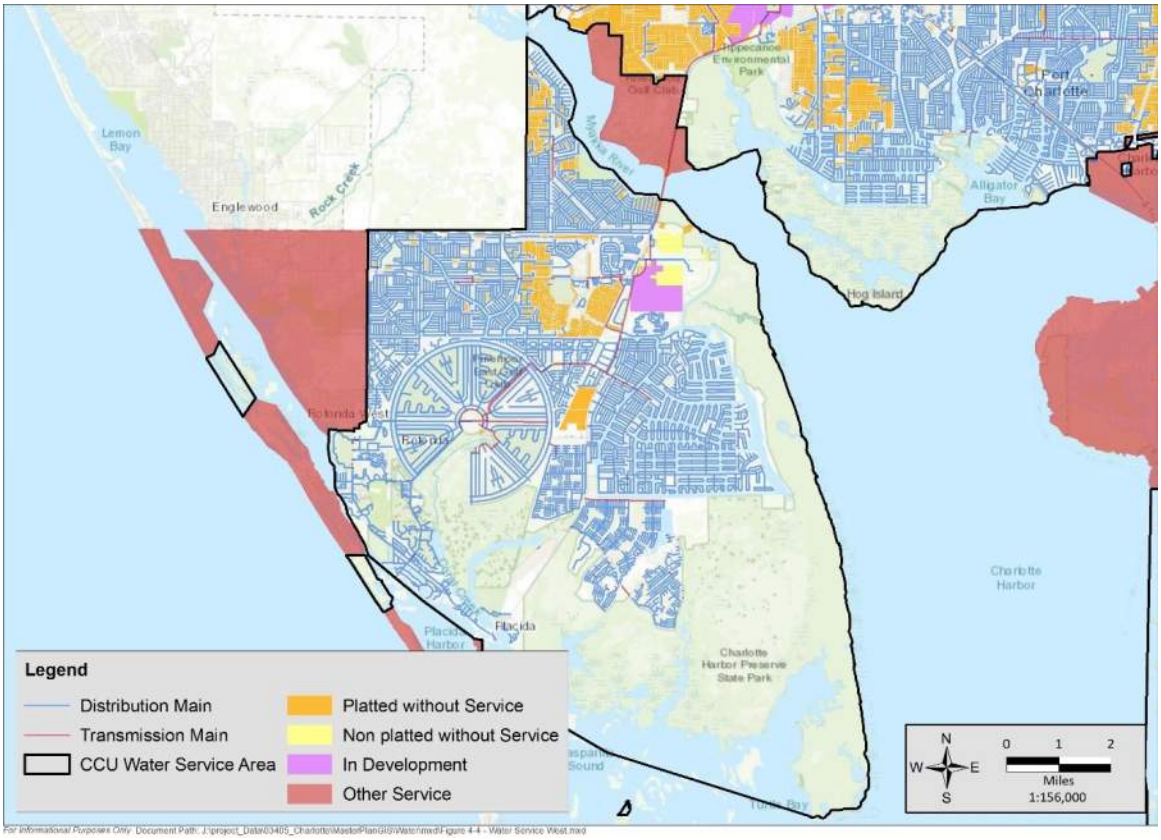
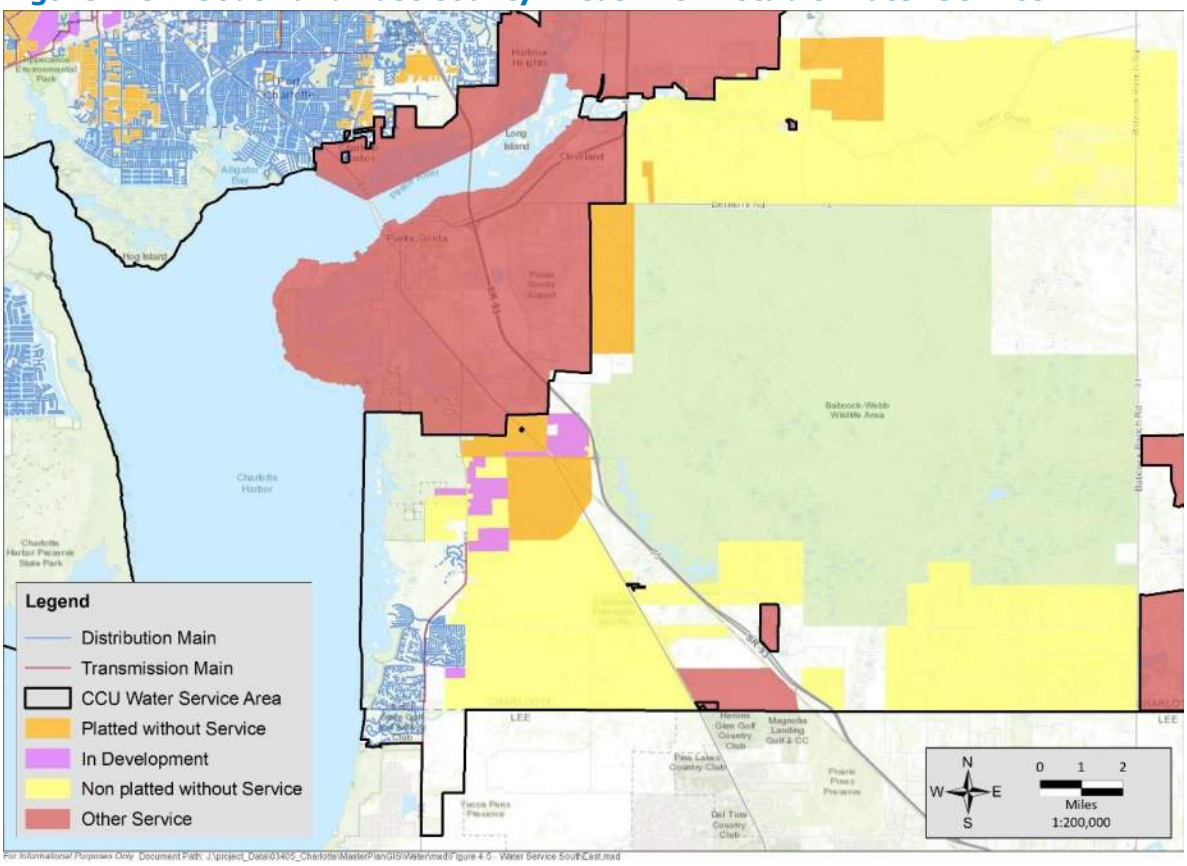


Figure 4-5 South and East County Areas with Potable Water Service



Primarily, water service expansion occurs when developers, with CCU guidance, locate and size new transmission and distribution mains to serve future development. CCU does not currently have an established plan for system expansion into already platted developments where water service is not currently provided. Rather, CCU works with developers to locate and size new transmission and distribution mains to serve future development.

In the past, CCU has completed some expansion projects that are not driven by new development when beneficial for water quality or in conjunction with other County capital projects. Before these expansion efforts, CCU considers the project's location relative to CCU's existing distribution system, water-quality impacts, expansion area's percent occupancy, return on investment, and environmental benefits to each project. For example, homes in platted areas without water service are typically equipped with a potable water well and on-site sewage treatment and disposal systems (OSTDSs). The environmental benefits for expanding the water system to these areas include reducing the local groundwater pumping demand on the aquifer and therefore slowing or preventing the occurrence of saltwater intrusion and removing nitrogen when water service expansion is accompanied by a septic-to-sewer conversion project for some or all of the expansion area.

4.2.2 Planned Developments

Major developments impact planning decisions for CCU since they often include rezoning large tracks of land from agricultural to residential and commercial, which significantly impacts the build-out population, water demands, and planned expansion of CCU's water distribution system. The Charlotte County Community Development Department (CDD) frequently receives data from developers and other entities planning to build commercial, retail, industrial, and residential buildings. CCU is currently experiencing rapid growth with many planned developments occurring within the service area. Figure 4-6 shows the recently planned developments in Mid and West Counties including the West County Town Center, West Port/Lux Biscayne, and Lost Lagoon. Figure 4-7 shows the recently planned developments for South County including Tucker's Grade and other properties on the Burnt Store Road corridor.

Figure 4-6 Mid and West County Planned Developments

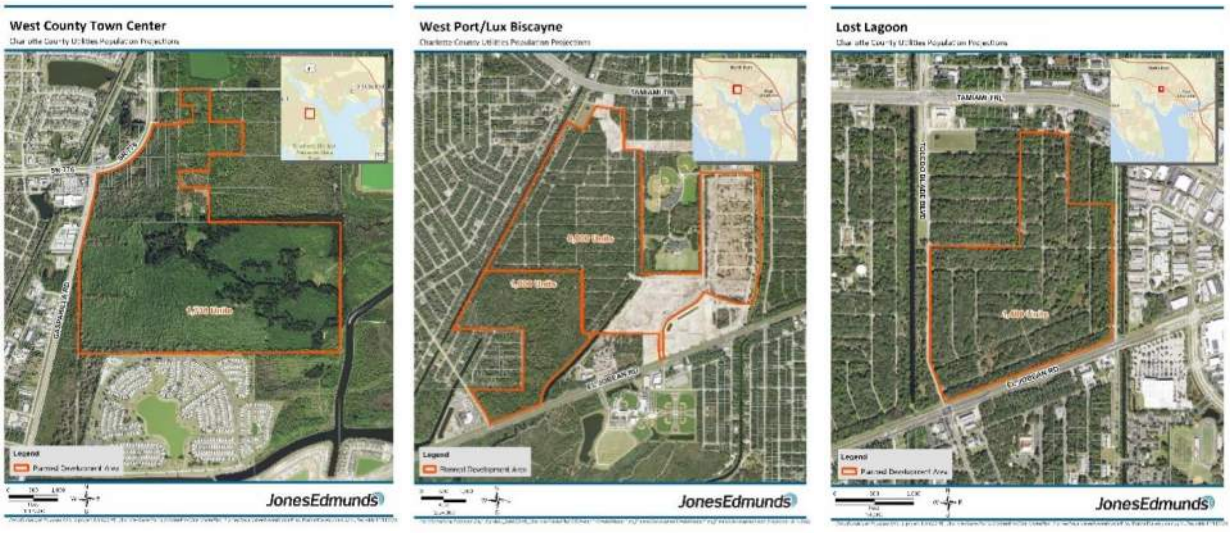
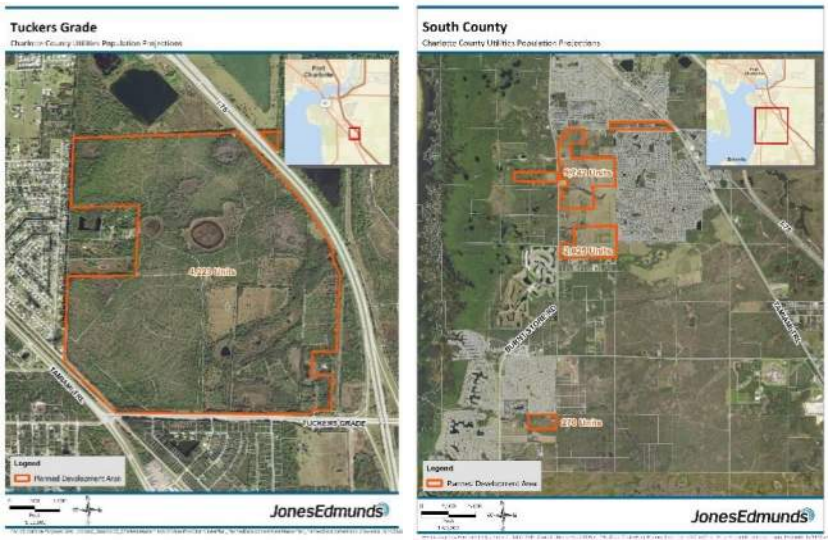


Figure 4-7 South County Planned Developments



4.2.3 CONSOLIDATION OF UTILITIES

Another factor that significantly impacts CCU's future water system expansion is the potential for consolidating or acquiring another water service provider. This type of acquisition typically includes the transfer of the seller's service area, assets, and customer base. Some of the benefits to acquiring a neighboring utility may include increasing the purchaser's WUP allocation, increasing the customer base, consolidating monitoring requirements, reducing sampling requirements, and scaling overall operations.

The other major water service providers in Charlotte County include the City of Punta Gorda, EWD, CHWA, Riverwood Community Development District, Gasparilla Island Water Association, El Jobean Water Association, NHC Utilities, Sun River Utilities, Knight Island Utilities, Little Gasparilla Water, Bocilla Utilities, Florida Governmental Utility Authority (FGUA) – North Fort Myers Utility, and Town and Country Utilities. Charlotte County also has eight small-community water systems including Tropical Palms MHP, Sun N Shade Family Campground, Shell Creek Park MHP, Pelican Perch RV Park, Paradise Park Condos, CCU Correctional Institution, Alligator Park MHP, and North Fort Myers Utility, Inc.

Figure 4-8 depicts the service and certificated areas for the public and private utilities in Charlotte County. These areas indicate the water service area jurisdictions for each water service provider in Charlotte County. As mentioned in Section 2.3, most of the CCU service area is not provided with water service at this time. This occurs primarily in the South and East Counties where population is sparse but as a legality are within CCU's service area. In some cases, CCU allows other water service providers to establish certificated service areas or provide water service within the County boundary lines. This primarily occurs when new developments are constructed far from CCU's existing potable water infrastructure.

Figure 4-8 Service and Certificated Areas for Utilities in Charlotte County

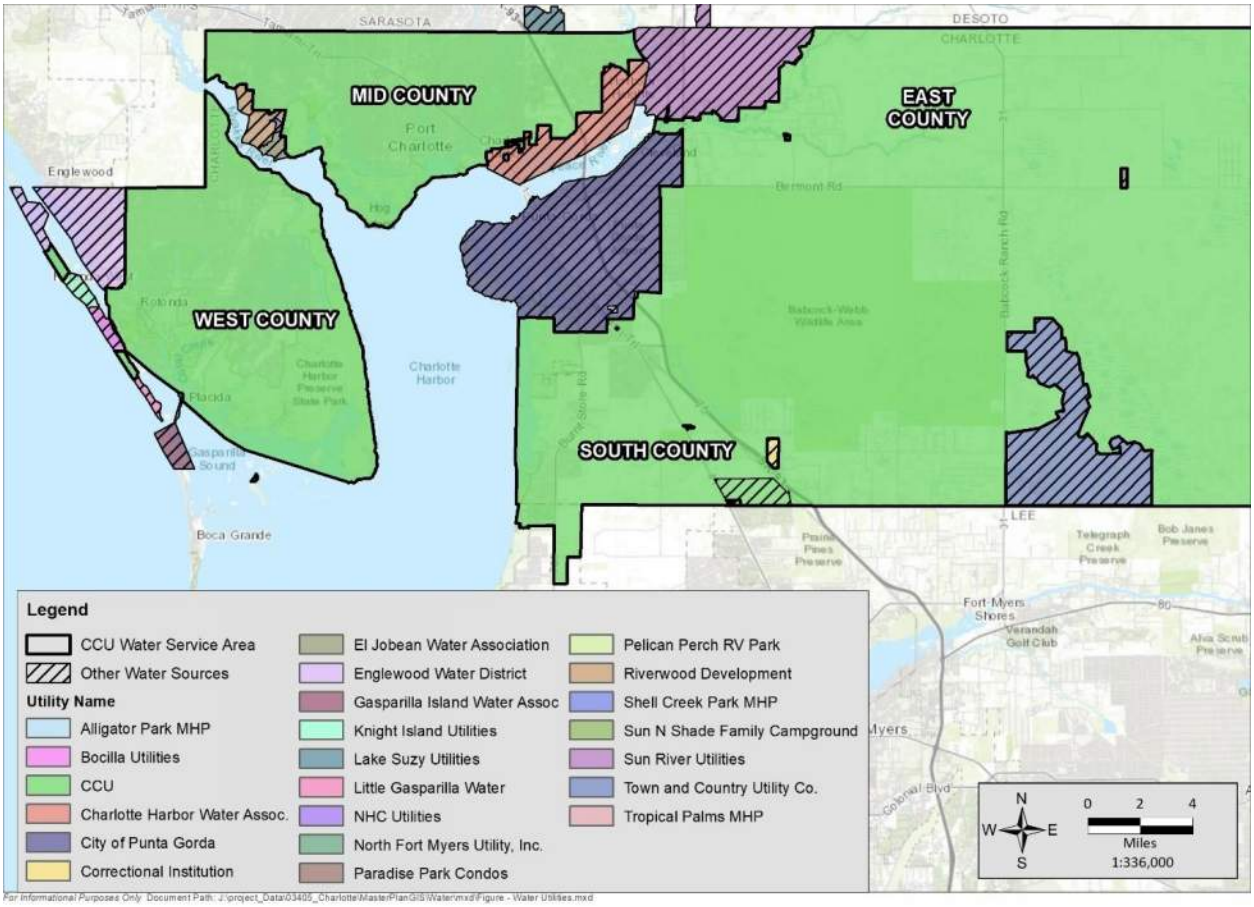


Table 4-1 provides the WUP information for the utilities that have their own permitted water sources, and Table 4-2 summarizes the service connections, population, and service area for purposes of considering future water demands. The table data were gathered from readily available sources including FDEP, FPSC, and the *Charlotte County 2050 Comprehensive Plan* and represent information reported in 2020.

Table 4-1 Water Service Provider's WUP Information

Water Service Provider	Permit Number	Permit Capacity AADF and PMF (gpd)	Permit Issued Date	Expiration Date
Charlotte Harbor Water Association	1512.014	910,200 AADF 1,028,600 PMF	3/24/2020	3/25/2050
Desoto County Utilities*	20457.001	675,000 AADF 810,000 PMF	10/27/2015	10/01/2037
Englewood Water District	4866.011	5,360,000 AADF 6,860,000 PMF	12/9/2020	12/9/2050
Gasparilla Island Water Association	718.015	1,537,600 AADF 1,952,800 PMF	1/28/2022	1/28/2032
City of Punta Gorda	871.012	8,088,000 AADF 11,728,000 PMF	10/30/2020	7/31/2027
FGUA – North Fort Myers Service Area	5360172	200,000 AADF Unknown PMF	Unknown	Unknown
Town and Country Utilities	08-00122-W	2,072,410 AADF 2,804,516 PMF	03/02/2021	03/02/2026
Sun River Utilities	14238	72,000 AADF Unknown PMF	Unknown	Unknown

* Desoto County purchases wholesale finished water from PRMRWSA.

Table 4-2 Charlotte County Major Water Service Provider Information

Water Service Provider	PWS ID	Service Connections	Population Served	Service Area (acres)
CHWA	6080044	1675	4,500	6,032
Riverwood Community Development District	5084111	1,506	3,765	1,362
El Jobean Water Association	6080081	595	1,327	438
NHC Utilities	5084110	200	401	83
Englewood Water District	6580531	18,461	—	6,223
Bocilla Utilities	6084079	423	1,057	525
Knight Island Utilities	6084075	201	431	545
Little Gasparilla Island Utilities	6080175	465	1,163	279
Gasparilla Island Water Association	6080104	1,740	6,143	975
City of Punta Gorda	6080051	12,817	36,302	23,876
FGUA – North Fort Myers Service Area	5360172	12,838	29,656	1,507
Town and Country Utilities	5084116	804	2,251	13,418
Sun River Utilities	6084074	60	90	12,394

Note: Data retrieved from MORs ranging from April 2020 to August 2020.

The Riverwood Community Development District, El Jobean Water Association, NHC Utilities (Encore Super Park), and Little Gasparilla Water Utility, Inc. currently purchase bulk treated water from CCU and resell it to their customers. Therefore, these service areas have been included in CCU's population and water-demand projections. The other private utilities have their own source-water supply as shown previously or purchase water from other neighboring utilities or suppliers. Therefore, the population and service connections associated with these utilities are summarized herein but are not used for estimating future CCU water demands.

Before acquiring a utility, CCU should perform an in-depth analysis to determine the value of the purchase and the risks and benefits to CCU. The analysis should include a detailed regulatory and compliance review, infrastructure condition assessment, capacity analysis review, and financial review as described below:

- A regulatory review should be conducted to assess the utility's compliance with the terms and conditions of WUPs, FDEP permits, and related regulations. The review should investigate infrastructure compliance, reporting compliance, and water-quality compliance. Data can often be obtained from FDEP and included in various permits and records, applications, notifications, reports, surveys, and monitoring plans. A summary of the reporting, water-quality and monitoring compliance requirements, and historical results should also be available for review to assess historical performance. The regulatory review is a critical piece in understanding the utility's ability to consistently maintain functionality and preserve public health.
- Although the regulatory review is used to determine historical performance trends, the condition and capacity analysis determines the current state of the system. The existing infrastructure should be carefully assessed to determine age, condition, construction

materials, and extents of the system. Field reviews should be conducted to assess the system conditions including visual observations and reviewing equipment age and O&M records and schedules. In addition, historical documents and record drawings should be reviewed to determine pipe material, age, and distribution system extents.

- The capacity of the installed supply and treatment components should be recorded and used to determine the overall capacity of the system. One of the primary benefits of CCU acquiring a utility would be to obtain additional water-supply allocations. This assessment should consider water-supply impacts, pumping, storage, and conveyance limitations and water-quality compatibility. Water-quality compatibility should be reviewed to determine the need for treatment modifications related to corrosion control and disinfection practices. If water quality varies significantly, then a corrosion control study may be necessary to address lead and copper compliance before merging the distribution systems. Likewise, systems that use different disinfection methods (chlorination versus chloramination) will also need to be reviewed and addressed. When possible, CCU's model should be used to assess the impacts on pressure, flow, and water quality when connecting the systems. These details are critical in understanding the potential financial burden of absorbing a utility.
- Once the condition and capacities of each component have been determined, a financial analysis should be completed. The financial analysis depends on the information gathered in the regulatory review, condition assessment, and capacity analysis and should include a detailed cost analysis of the utility's assets. The valuation of the assets is typically estimated considering the age and condition of each asset. The financial analysis should consider valuations of the utility's assets, number of connections and generated revenue, and O&M and replacement costs. In the case of expanding distribution systems, the analysis should consider the resources needed to model, design, and construct the infrastructure required to connect the systems. In this manner, CCU can accurately assess the potential financial burden or benefit of acquiring or consolidating a utility.

Some of the information listed previously has been gathered for each water-service provider and documented in Appendix C. If CCU pursues acquisition or consolidation with one of the water-service providers within the County boundaries in the future, an engineering report should be prepared as part of the review and due diligence process. However, no utilities are currently requesting consolidation or acquisition from CCU.

4.3 Water-Demand Projections

This section presents the water-demand projections using the methodology discussed previously. Platted areas in Mid and West Counties served by the Port Charlotte Water System were included in water-demand projections through 2045 since the water distribution system network is robust in these areas. In South County, the water-demand projections include the platted areas south of I-75 served by the Burnt Store Water System since expansion to the area east and northeast of Punta Gorda is not expected to be served in the planning period. For areas with planned developments, water demands were calculated based on the land use type, number of DUs, and commercial building size provided by the developers. Jones Edmunds updated the existing development zone data to reflect build-out DUs and NRI SF provided by the developer and used the SWFWMD projections to estimate current flows. The planned developments were assumed to build out

over 15 to 25 years based on discussions with CCU staff. The water demands associated with CCU's bulk users were accounted for in the projections and validated against recent MORs for each system. The population and service connections associated with other water services providers were not included since no water system acquisitions are being considered at this time.

Figure 4-9 and Figure 4-10 depict the historical and projected annual average daily demand (AADD) for the Mid/West and South County areas, respectively. The figures show the projected demands under low-, medium-, and high-growth conditions to 2045. As discussed in Section 4.2, expected developments and BEBR growth ratios were used to determine the 5-, 10-, 15-, 20-, and 25-year water-demand projections for the CCU PWSs. Interpolation was used to determine the yearly projections. Appendix D provides the tabular data including the projected PMF and MDFs for both systems.

Figure 4-9 Port Charlotte Water System Historical Water Use and Demand Projections

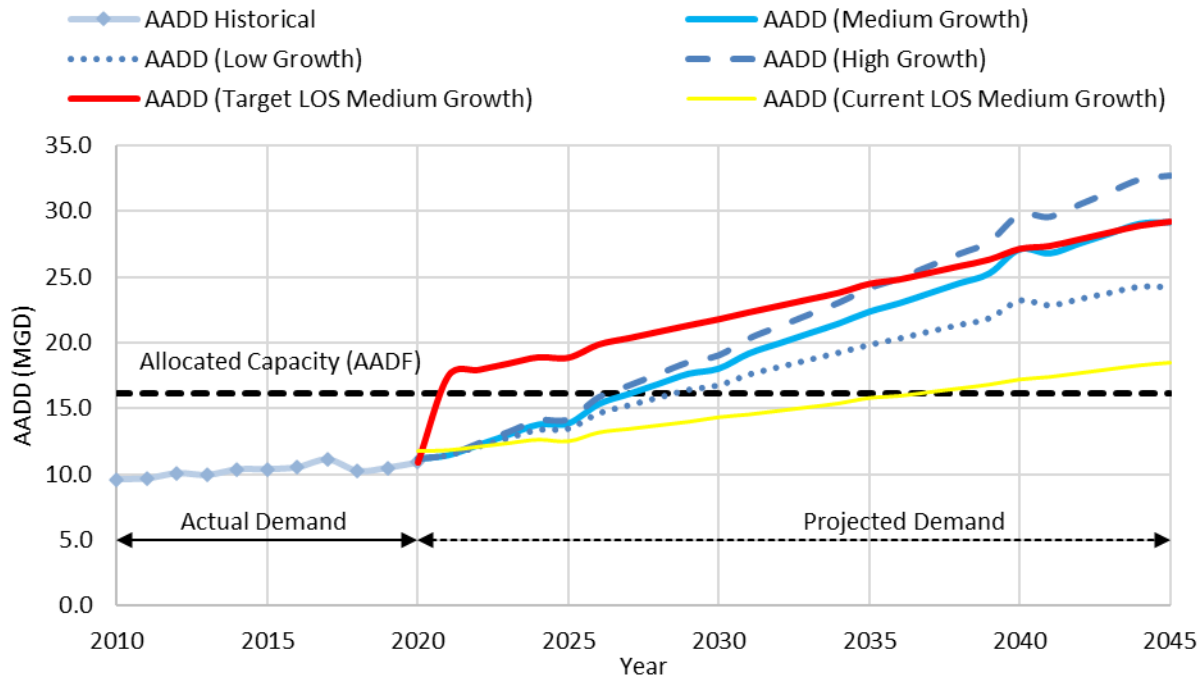
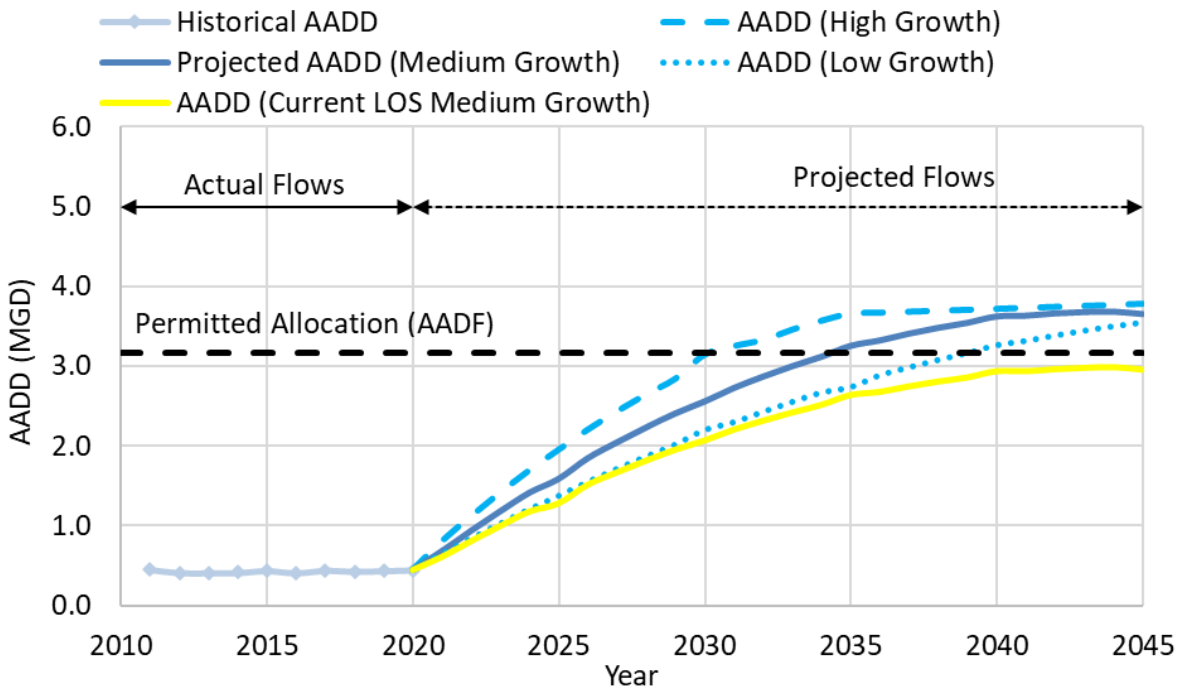


Figure 4-10 Burnt Store Water System Historical Water Use and Demand Projections



The historical demands for the Port Charlotte Water System serving Mid and West Counties were obtained from interconnect data reported in the CCU PSARs. The medium-growth projected flows are displayed under current and target LOS (225 gpd/ERC) flow conditions. Jones Edmunds determined the current LOS for 2020 by comparing CCU-metered flow data to projections for population, DUs, and NRI SF. The current LOS for the Port Charlotte and Burnt Store Water Systems are estimated to be 145 gpd/ERC and 175 gpd/ERC, respectively. The difference is due to variances in the population, DU, or NRI SF data or the assumed ratio of PPH. Projected flows under low-, medium-, and high-growth conditions were incrementally adjusted from the current water use values calculated for 2020 to the LOS goal of 225 gpd/ERC to mimic a changing demographic population. The Port Charlotte Water System allocated capacity will be exceeded in 2027 based on medium-growth projections assuming CCU's target LOS goal of 225 gpd/ERC is met by 2045. However, if CCU continues to operate at the current LOS, the allocated capacity may not be exceeded until approximately 2037.

For the Burnt Store Water System serving South County, historical demands are based on the Burnt Store SCADA data. Significant growth is projected to immediately occur in South County and continue for the next 15 years. The growth is largely based on recent developer interest and therefore expected buildout of future developments. High-growth projections are expected in this area since the completion of the Burnt Store Roadway Phase II extension will increase the visibility of the area. The permitted capacity for the Burnt Store Water System is estimated to be exceeded in 2034.

Table 4-3 and Table 4-4 summarize the projected residential and NRI AADDs for the Port Charlotte and Burnt Store Water Systems, respectively. Table 4-3 also includes a 0.6-MGD demand for the development of a proposed water park in Mid County. For planning purposes, Mid, West, and South Counties use a medium BEBR growth factor for projecting

water demands. The values reported in Table 4-3 and Table 4-4 indicate total AADD will be approximately 29.2 MGD for Mid and West Counties and approximately 3.6 MGD for South County in 2045. Buildout flows could be as high as 42.5 MGD in Mid and West Counties and 10.9 MGD in South County based on current zoning, population, and planned development information.

Table 4-3 Port Charlotte Water System Medium-Growth Water Demand Projections

Year	2025	2030	2035	2040	2045	Buildout
Residential Demand (MGD)	12.9	16.1	19.8	24.0	25.9	37.6
NRI Demand (MGD)	0.96	1.38	1.90	2.50	2.71	4.27
Other NR Demand (MGD)	0.0	0.6	0.6	0.6	0.6	0.6
Total	**13.8**	**18.0**	**22.3**	**27.1**	**29.2**	**42.5**

Table 4-4 Burnt Store Water System Medium-Growth Water Demand Projections

Year	2025	2030	2035	2040	2045	Buildout
Residential Demand (MGD)	1.4	2.2	2.7	3.1	3.1	10.3
NRI Demand (MGD)	0.2	0.4	0.5	0.6	0.6	0.6
Total	**1.6**	**2.6**	**3.2**	**3.6**	**3.6**	**10.9**

Jones Edmunds did not complete detailed projections for the East County area for this planning effort; however, SWFWMD's current population projections show very little growth in a large portion of East Charlotte County. As growth continues throughout Florida, large developers will continue to seek opportunities for community developments. The Villages and Lakewood Ranch are two entities that have seen enormous growth and have similar attributes to East Charlotte County. CCU does not have infrastructure in these areas, but the areas are within CCU's certificated water service area and therefore growth should constantly be monitored and considered for planning future water supply.

4.4 Historical Demands and Existing Trends

Historical demands play an essential role in establishing existing capacities and planning future water system infrastructure improvements projects. Jones Edmunds obtained daily water demand flow data from the SCADA systems to show the historical purchased and produced water quantities of the PRMRWSA interconnects and the Burnt Store WTP for the Port Charlotte and Burnt Water Store Systems, respectively. The data are commonly used to report flows on CCU's MORs and PSARs. The historical water-demand data were organized into multiple statistical bases including AADD, maximum daily demand (MDD), peak monthly demand (PMD), and minimum weekly demand (MinWD) to determine permit compliance, existing capacity limitations, and assess future water supply and treatment capacity.

The AADD quantities are calculated from the total quantity of water purchased or withdrawn over 1 year divided by the number of days in the year, which results in a gpd quantity. The AADD is often displayed as a 12-month rolling average consistent with monitoring requirements in WUPs. MDD quantities represent the maximum water demand experienced

over 24 hours. The MDD was determined for the Port Charlotte and Burnt Store Water Systems from total daily demand data collected for each system. MDD is sometimes used for permit compliance but is commonly used to size infrastructure components. The PRMRWSA-contracted MDD is 22.54 MGD. The Burnt Store Wellfield WUP does not specify a maximum day capacity but is limited by the capacity of the infrastructure installed at the WTP, which is 3.61 MGD. Table 4-5 depicts the AADD, MDDs, and the MDD:AADD coefficients from 2011 to 2020 for each PWS. The data show historical MDD values for the Port Charlotte Water System are consistently below the contract MDD amount. However, based on the historical Port Charlotte Water System MDD factors, the MDF peaking factor of 1.4 established for Charlotte County in the MWSC (also noted in Section 3.1.2) may need to be adjusted in the future.

Table 4-5 AADD, MDD, and MDD:AADD Coefficients from 2011 to 2020

Year	Port Charlotte Water System			Burnt Store Water System		
	AADD (MGD)	MDD (MGD)	MDD:AADD Coefficient	AADD (MGD)	MDD (MGD)	MDD:AADD Coefficient
2011	9.87	12.10	1.25	0.45	1.13	2.5
2012	9.78	13.26	1.32	0.41	1.34	3.3
2013	9.94	13.56	1.37	0.41	0.77	1.9
2014	10.28	12.99	1.25	0.41	0.66	1.6
2015	10.39	12.38	1.19	0.44	1.08	2.5
2016	10.37	15.85	1.51	0.41	0.65	1.6
2017	11.05	14.62	1.31	0.44	1.11	2.5
2018	10.63	14.49	1.42	0.43	1.29	3.0
2019	10.23	13.00	1.24	0.43	1.32	3.0
2020	10.95	13.89	1.19	0.47	1.07	2.3

Table 4-6 identifies the PMD quantities that represent the highest AADD observed in a month. The table also specifies the month of occurrence with the highest demand and the peak month coefficient for each system. The PMD quantities represent the greatest quantity permitted to be used in any single month, which must comply with the peak monthly use amounts listed in CCU's PRMRWSA contract agreement and the SWFWMD WUP. The PRMRWSA-contracted amount stipulates a PMD of 19.32 MGD, and the Burnt Store WUP specifies a PMD of 4.118 MGD. The data indicate that the PMDs for both systems are consistently below the contracted PMD limitations. In addition, the historical peak month coefficient for the Port Charlotte Water System is consistently below the value of 1.2 established in the MWSC.

Table 4-6 Peak Monthly Demands, Months, and Coefficients from 2011 to 2020

Year	Port Charlotte Water System			Burnt Store Water System		
	PMD (MGD)	Peak Month	Peak Month Coefficient	PMD (MGD)	Peak Month	Peak Month Coefficient
2011	10.84	March	1.12	0.51	February	1.14
2012	11.34	November	1.13	0.57	February	1.39
2013	11.32	November	1.14	0.52	February	1.26
2014	11.61	May	1.12	0.51	March	1.23
2015	11.42	April	1.10	0.56	January	1.28
2016	12.12	December	1.15	0.54	March	1.31
2017	12.86	March	1.15	0.56	March	1.28
2018	11.84	March	1.16	0.54	March	1.27
2019	11.25	March	1.07	0.56	January	1.28
2020	12.76	March	1.14	0.59	March	1.27

The PMD for each year at the Burnt Store Water System occurs in January, February, and March. The PMD for the Port Charlotte Water System has more variability and historically occurred in March, April, May, October, November, and December. The PMD coefficients are determined by dividing the PMD by the AADD and are used for projecting future water demands and estimating future withdrawal needs.

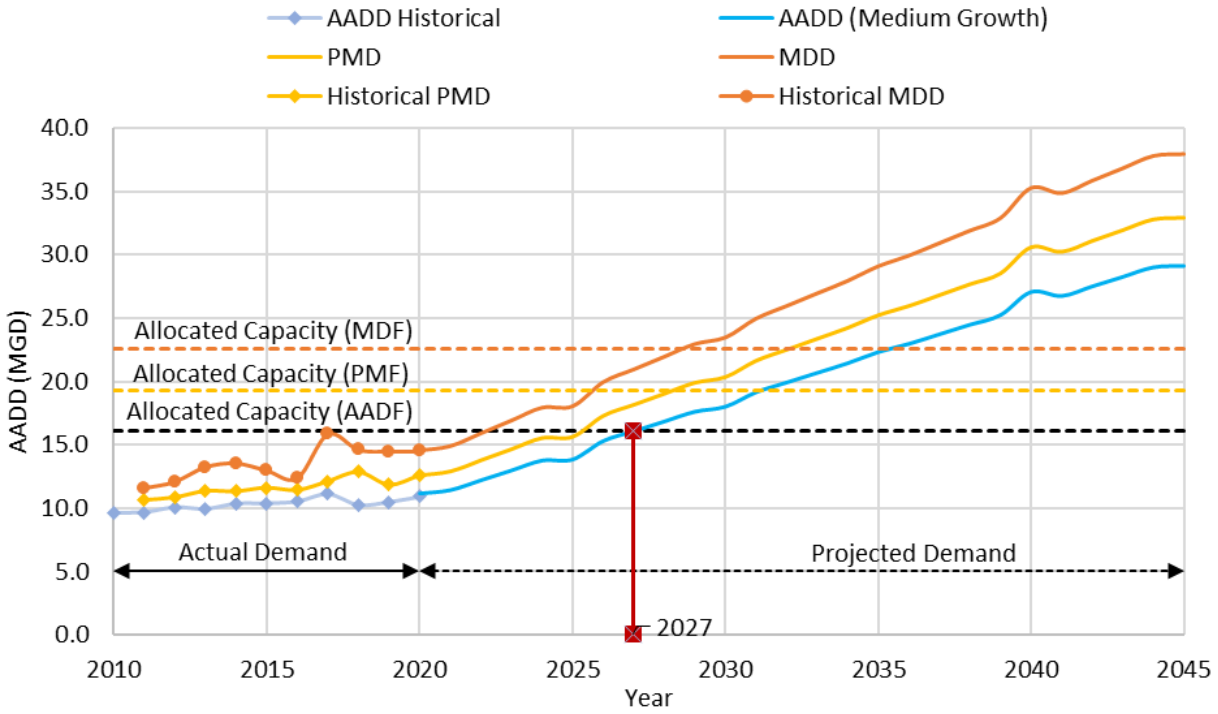
4.5 Current and Future Capacity Considerations

This section discusses the current and future water supply and treatment capacities and presents a timeline for upgrading water system infrastructure to meet future demand projections. As discussed in Chapter 3, CCU's water supplies are limited for the Port Charlotte Water System by its allocated capacity from PRMRWSA and for the Burnt Store Water System by its permitted wellfield supply based on various statistical bases. The Burnt Store Water System is further limited by its current well pumping capacity and impacted by the permitted capacity of the WTP and disposal capacity of the deep injection wells. WUPs are typically permitted based on AADF and PMF conditions, whereas the treatment capacity of the WTP must be designed to meet MDF conditions to ensure continuous service to the public. As such, the peaking factors must be determined when planning future water supply needs and WTP upgrades. In addition, CCU should continue to monitor historical MDD and PMD peaking factors for the Port Charlotte Water System with respect to MWSC peaking factors of 1.2 MDF and 1.4 PMF to ensure future CCU water supply needs do not exceed allocations.

Determining the water supply capacity and limiting year for the Port Charlotte Water System is relatively straightforward since only the future demands and current allocations need to be considered. The Port Charlotte Water System is currently limited by the supply allocations of 16.1 MGD AADF, 19.32 MGD PMF, and 22.54 MGD MDF. Figure 4-11 displays the historical and projected AADD, PMD, and MDD compared to the allocated capacity on an AADF, PMF, and MDF basis. Jones Edmunds used the historical PMD and MDD ratios and the AADDs to estimate the projected PMD and MDD presented in Figure 4-11. The average historical PMD and MDD peaking ratios for the Port Charlotte Water System were

determined to be 1.13 and 1.3, respectively. The figure shows that CCU has historically complied with the agreement amounts from an AADF, PMF, and MDD basis, but that additional allocation will be required in 2027 to satisfy flows under medium-growth conditions.

Figure 4-11 Port Charlotte Water System Historical and Projected AADD, PMF, and MDD



Determining the water supply capacity and limiting year for the Burnt Store Water System is more complicated since current and permitted well allocations must be considered in addition to the water treatment process. The water treatment process is a critical consideration in water supply planning since RO treatment yields additional water losses and therefore requires additional water supply to meet demands. According to the *2021 CCU Annual Report (Jones Edmunds, 2021)*, the Burnt Store RO WTP experiences RO water treatment losses of approximately 20 percent. The future limitations of the Burnt Store Water System are defined and assessed based on its wellfield capacity, permitted WTP capacity, and the capacity of its injection wells.

The Burnt Store Water System is currently permitted to withdraw and treat up to 3.172 MGD AADF, 3.61 MDF, or 4.117 MGD PMF based on the WUP and WTP capacities. However, since CCU currently only has six wells installed as described in Section 3.2.1, the wells are limited to 1.70 MGD AADF and 2.23 MGD PMF. Figure 4-12 shows the historical and projected AADD, PMD, and MDD compared to the current well capacity on an AADF and PMF basis and the permitted treatment capacity on a MDF basis. The projected PMD and MDD curves were developed using the average historical peaking ratios for PMD, but the MDD ratio was adjusted to 1.6 to account for daily variations attributed to overnight irrigation demand. The vertical red bars on the graph indicate the estimated timing for when

the demands will exceed the current well or treatment capacities based on medium-growth conditions and indicate which limitation is most pressing. The figure shows that the Burnt Store Water System is limited by the existing well capacity and due to the WTP losses will exceed its production capacity as early as 2024.

Figure 4-12 Burnt Store Water System Limitations Considering Total Current Wells

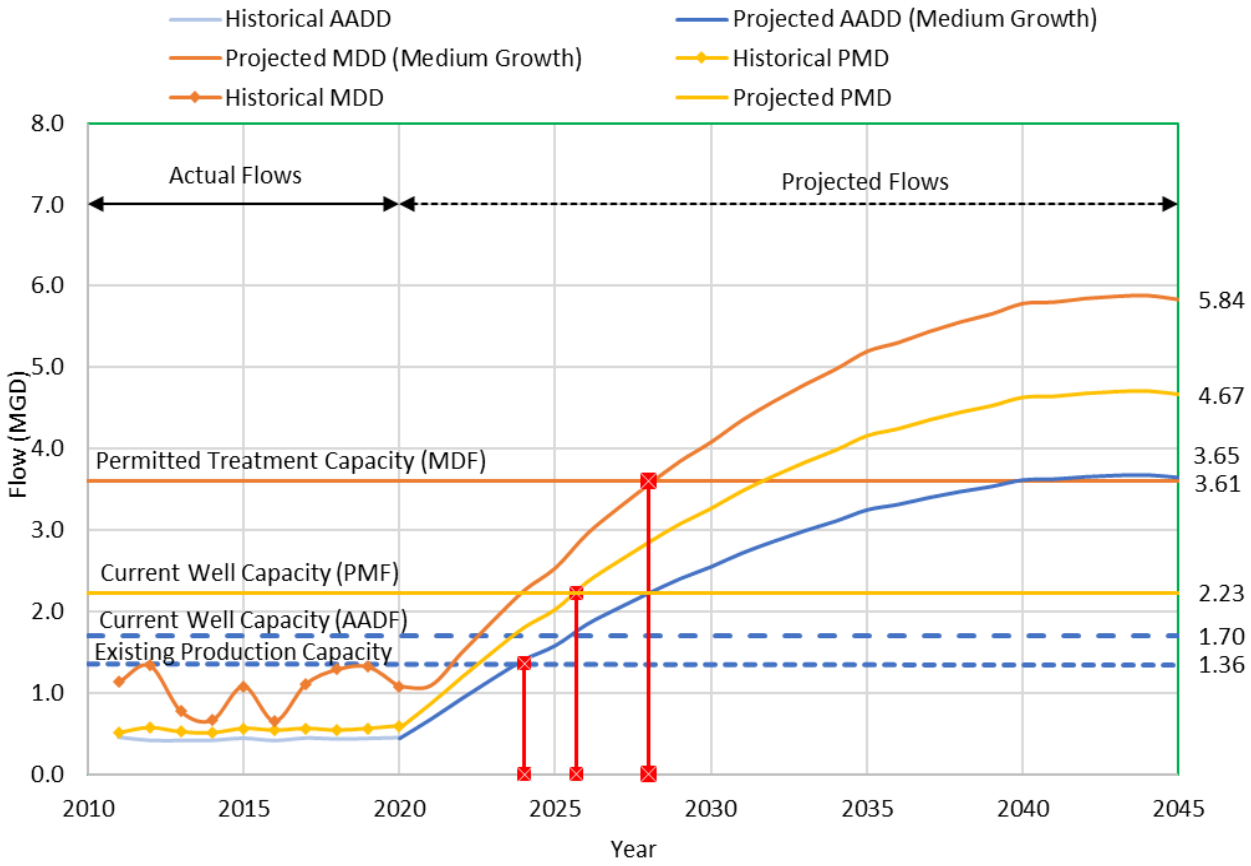


Figure 4-13 shows the expected impacts if the four additional permitted wells were installed so that the full allocation could be obtained. The figure shows the historical and projected AADD, PMD, and MDD compared to the permitted well capacity on an AADF and PMF basis and the permitted treatment capacity on a MDF basis. The vertical red bars on the graph indicate the estimated timing for when the demands will exceed the permitted well or treatment capacities based on medium-growth conditions. The figure shows that the permitted WTP capacity intersects the projected MDD in 2028 and will become the limiting factor of the Burnt Store Water System. This indicates that the maximum day treatment capacity of the Burnt Store RO WTP will require expansion to meet future demands. In addition, the AADD exceeds the permitted well allocations in 2030 and 2035 on an AADF and PMF basis, respectively.

Figure 4-13 Burnt Store Water System Limitations considering Total Permitted Wells

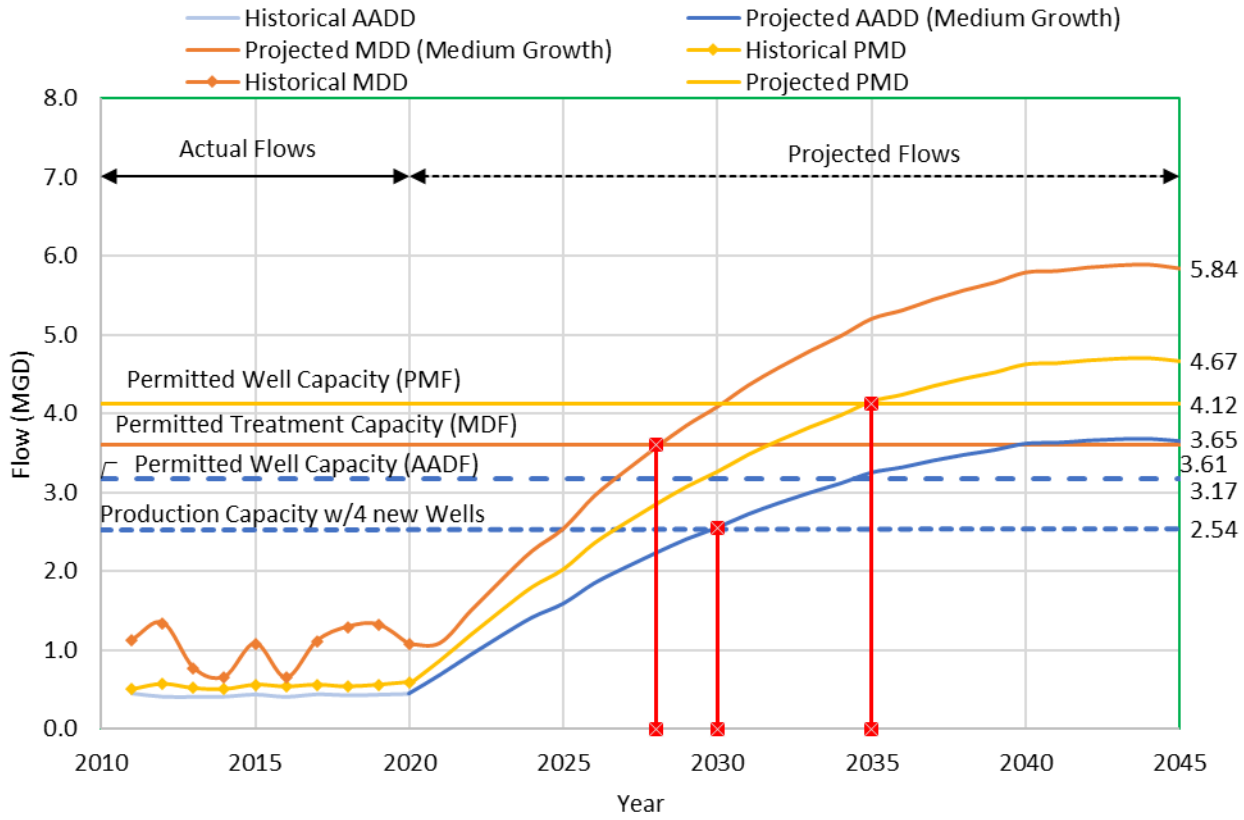


Figure 4-12 and Figure 4-13 depict the existing and future production capacities for the Burnt Store Water System without and with all the currently permitted wells in service, respectively. Conversely, Figure 4-14 depicts the supply and treatment capacities required for meeting 2045 water demand conditions. WTPs are permitted on a MDF basis, and the Burnt Store RO WTP operates at a recovery of 80 percent. Therefore, Figure 4-14 displays the well capacity requirements under PMF and AADF conditions, the RO production requirements, and the WTP maximum day operating capacity for meeting 2045 water demand conditions accounting for 20-percent water treatment losses. Table 4-7 summarizes the projected water demands and supply needs for the Burnt Store Water System considering 20-percent treatment losses and various design flow conditions.

Figure 4-14 Burnt Store Water System Water Supply and Treatment Requirements Accommodating Treatment Loss

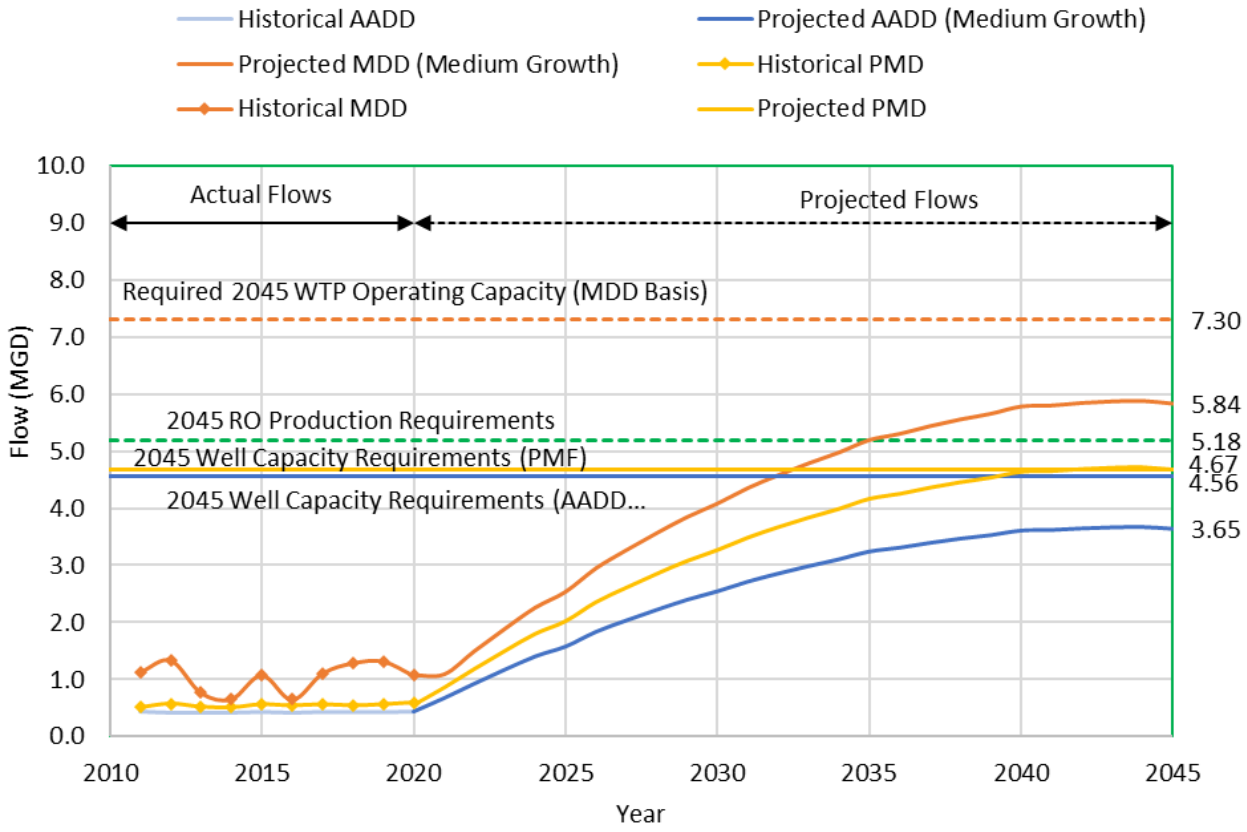


Table 4-7 Burnt Store Water System Future Design Conditions Accommodating Treatment Losses

Design Parameter	Design Condition	2045 Water Demands (MGD)	2045 Water Supply Needs (MGD)
Permitted Well Capacity	AADF	3.65	4.56
Permitted Well Capacity	PMF	4.67	4.67
Permitted Treatment Capacity	MDF	5.84	7.30
Raw Water Pumping Capacity	MDF	3.65	7.30

This analysis indicates that the Burnt Store WTP will require double the current maximum day operating capacity of the WTP to meet 2045 demands representing a significant expansion. MORs and historical design documents specify a permitted maximum day operating capacity of 3.61 MGD for the Burnt Store WTP. However, the *2021 Sanitary Survey* (FDEP, 2021) specifies that a WTP design capacity of 1.127 MGD, which would have major impacts on the timing of the expansion. Based on a review of historical documents, the true current WTP design capacity is unclear. CCU should conduct a study to confirm and establish the actual and firm capacities of the major components for the Burnt Store WTP to determine which upgrades will be required to expand the WTP capacity. Considerations should also be given for the WTP's ability to dispose of concentrate flows.

CCU uses the Burnt Store WRF deep injection well system (IW-1 and IW-2) for disposing of the concentrate stream; the wells are also used for reclaimed water disposal. Approximately 20 percent of the water produced by the plant becomes concentrate through the RO process. As discussed in Section 3.2.2, only a minor portion (≈5 percent) of the total disposal well capacity is currently used for RO concentrate disposal. As water demands increase, concentrate flows will increase proportionally and the capacity of IW-2 may be exceeded by 2032 based on total disposal rates. Although the WRF also operates IW-2, which has significantly more capacity, IW-1 is limited and does not provide a full backup to IW-2. This should be considered when planning for future disposal system resilience.

Based on the analysis conducted herein, the Port Charlotte Water System will exceed its current allocation in 2027, and the Burnt Store Water System will exceed its current production capacity as soon as 2024. Additional wells can be installed in the Burnt Store wellfield to expand the capacity to 2.54 MGD AADF and prolong the Burnt Store Water System exceedance until 2028 or 2030 based on meeting future MDF conditions and considering treatment losses. Additional wells should be located northeast of the current wells along Zemel Road based on assumed available well supply water quantity and quality and preliminary discussions with CCU staff. Both systems will require significant increases in water supply to meet future demands. Table 4-8 summarizes the current and future water supply needs and deficiencies of CCU's PWSs. The Port Charlotte and Burnt Store Water Systems are projected to have deficiencies of 13.1 MGD and 1.95 MGD based on AADF conditions, respectively. The analysis indicates an additional 15.1 MGD AADF is required to serve CCU residents in both systems. The following chapters discuss the potential water conservation measures and regional supply options for meeting future demands.

Table 4-8 Potable Water Supply Deficiencies Based on Demands in 2045

PWS	Service Area	Current Permitted/ Allocated Supply (AADF)	2045 Water Needs (AADDs)	2045 AADF Deficiencies
Port Charlotte Water System	Mid/West County	16.1	29.2	13.1
Burnt Store Water System	South County	1.70	3.65	1.95
	Totals	**17.8**	**32.9**	**15.1**

5. WATER CONSERVATION

OVERVIEW

Water conservation is a critical planning component of water supply resource management and a mandatory requirement for PWSs in Florida. As Chapter 4 discusses, CCU's projected water demands are expected to exceed its current water supply and production capacities as early as 2027 in Mid/West County or 2024 for South County. Water conservation has the potential to extend the lifetime of existing resources and has several downstream benefits from reduced potable demands. For example, reducing potable water demand also decreases wastewater flows – effectively deferring plant capacity shortages, O&M, and capital improvement expenses at these facilities, which can lead to significant cost savings for utilities and customers within the community. Therefore, a successful water conservation program has several benefits including reduced potable water demand, prolonged useful life of potable water supply sources, and improved community understanding of water resources. This chapter discusses regulatory drivers for water conservation, summarizes CCU's water conservation plan, reviews CCU's water conservation efforts to date, and provides recommendations for future water conservation techniques.

5.1 REGULATORY DRIVERS

Water conservation is defined by FDEP as the *prevention and reduction of wasteful, uneconomical, impractical, or unreasonable use of water resources*. Pursuant to Chapter 373.016, FS, FDEP facilitates water conservation regulations regionally through water management districts, which establish WCP guidelines in their WUP *Applicant's Handbooks* (SFWMD, 2015). WCPs typically include five key elements: a public education program, an incentive-based water-rate structure, indoor and outdoor water reduction programs, and a water-loss-reduction program. WCPs must demonstrate that applicable water conservation measures, which are environmentally, technically, and economically feasible, have been employed or are planned to be employed by the applicant.

During the WUP application process (for new permits or renewals), WCPs are reviewed for adequacy, promotion of conservation, and overall demonstration of progress toward the goals outlined therein. Since benefits associated with a successful WCP are often difficult to quantify, per-capita-per-day water usage remains the primary metric to gauge overall effectiveness. Once a WUP is issued, WCPs become public domain and serve as collective water conservation goals for utilities, their communal population, and applicable governing agencies.

5.2 CCU's Water Conservation Plan

The potable water service areas for the Port Charlotte and Burnt Store Water Systems currently fall under the jurisdiction of SWFWMD, but East County splits jurisdiction between SWFWMD and SFWMD. As such, CCU has developed its WCP considering the guidelines of both districts and identifies short-term needs, long-term goals, and planning objectives in accordance with regulatory guidelines. The following sections summarize the five key elements of the CCU WCP, CCU's additional efforts to expand reclaimed water use, and CCU's provisions on emergency water shortages.

5.2.1 Public Education

The public education component is an integral part of the WCP since water conservation broadly depends on user habits and lifestyle. Residents play an important role in fulfilling local water conservation goals by reducing per-capita use of potable water. CCU has historically and is currently engaged in the promotion of water conservation through public education, community outreach, and marketing.

Public education efforts include:

- *H_2O and Your Health Program* – for proper hydration by drinking CCU tap water.
- Participating in various programs that promote and provide water conservation information in local schools.
- Participation in the County's *Ambassador Program*.
- Every year since 2007, Charlotte County BCC recognizes April as *Water Conservation Month*.
- Charlotte County BCC observes *Drinking Water Week* for 1 week each May.

Community outreach events include:

- Having a Water Conservation Booth at the Charlotte Harbor Nature Festival.
- Speaking engagements at homeowner association meetings.
- Engineering availability and business services presentations to Charlotte County realtors.
- Participating in the SWFWMD Conservation Exposition.
- Presenting project information meetings for residents and business owners.
- Participating in several community-wide events promoting water conservation in the County and providing literature, materials, games, and prizes. Charlotte County's booths are popular and well attended and involve a high degree of public interaction.
- Observing Drinking Water Week each May by the BCC adopting an annual resolution.
- Providing a booth in the County's shopping mall, staffed 10 hours daily during *Drinking Water Week*, which historically attracts several thousand visitors through unique water-related games, presentations, and prizes. Staff members of the PRMRWSA are invited and often participate in the week-long event.

Marketing efforts include:

- Launching CCU's Facebook page to the public on November 11, 2014, where CCU posts critical information about water conservation measures, community outreach events, upcoming and ongoing projects, utility department awards, and more.

- Posting information regarding current water restrictions, conservation tips, and general CCU current events at the Charlotte County website, *www.charlottecountyfl.gov*, and at the Administration office.
- Providing utility vehicles with *CONSERVE WATER* stickers on the bumpers.
- Providing water conservation messages on billing statements.
- Partnering with the Charlotte Harbor Environmental Center (CHEC) in efforts to increase awareness and sensitivity through conservation materials mailed to high-use customers and placing CHEC displays at utilities' locations.
- Developing a water conservation video segment for *Charlotte Showcase* as well as three water-conservation public service announcements (PSAs) that can be seen on CCTV-20 as well as the County and CCU web page.
- Providing handouts and conservation displays at the Environmental Campus and Administration Building.
- Disseminating the following water loss-control material and devices:
  - AWWA and SWFWMD water conservation and leak control literature.
  - Dye test tablets.
  - Rain gauges.
  - Water flow restrictors/aerators.
  - Water-displacement toilet-tank bags.
  - Toilet flappers.
- Promoting water conserving landscape design such as xeriscaping, fixtures, and practices through local civic and business groups such as the Chamber of Commerce.
- Exploring cooperative funding efforts with the PRMRWSA to institute low-flow rebate programs, such as giving credits for those users who retrofit existing fixtures with low-flow shower heads and toilets.

CCU wants customers to be a positive force for reducing water usage but understands that the public must be properly informed and provided with the appropriate resources to make better decisions. To meet this need, CCU will continue to offer its customers a diversified platform of community outreach and public education events promoting water conservation.

5.2.2 Rate Structure

CCU's vision for rate structures is to ensure safe, reliable utility services at fair and reasonable rates. In accordance with Chapter 373.227(3), FS, CCU is responsible for establishing rate structures that promote water conservation and provide reasonable assurance as a means of reducing potable water demands. Table 5-1 presents the current rate schedules for CCU potable water residential customers.

CCU implemented increasing-block potable water rates to incentivize responsible, efficient water use in 2006. CCU uses a five-tier potable water rate structure where the water user pays different prices per unit of water delivered depending on the amount used, with a higher price charged for larger quantities. Potable water service charges include standard, emergency, and irrigation. Emergency rates are reserved for times of water shortage and

generally have not been charged since 2010. In accordance with water conservation objectives of Charlotte County and Florida, irrigation using potable water, also referred to as lawn watering, is restricted to a 2-day-per-week basis.

Table 5-1 CCU Utility Rate Structure for Residential Customers

Utility Service/Rate Tier[1]		Gallonage Charge per 1,000 Gallons
POTABLE WATER[2]		
Standard:		
Tier 1)	0 – 5,999 gallons	$5.85[1]
Tier 2)	6,000 – 10,999 gallons	$6.72
Tier 3)	11,000 – 15,999 gallons	$8.47
Tier 4)	16,000 – 25,999 gallons	$9.64
Tier 5)	26,000 gallons and above	$11.11
Emergency:		
Tier 1)	0 – 5,999 gallons	$5.85
Tier 2)	6,000 – 10,999 gallons	$8.07
Tier 3)	11,000 – 15,999 gallons	$11.02
Tier 4)	16,000 – 25,999 gallons	$13.50
Tier 5)	26,000 gallons and above	$16.67
POTABLE WATER IRRIGATION		
Tier 1)	0 – 15,999 gallons	$8.47
Tier 2)	16,000 gal and above	$9.64

[1]Rate table does not include applicable base facility charges. CCU maintains complete current rate schedules on their publicly accessible website https://www.charlottecountyfl.gov/.
[2]Potable water rates shown are for residential users. Bulk users are charged a flat rate of $3.61 per 1,000 gallons.

Reducing water usage to adhere to the lower tiers can result in notable savings. The following example illustrates potential savings from one tier to the next.

Family of four @ 90 gallons per capita day (gpcd): 90 x 365 days/year x 1 year/12 months x four people = 10,950 gallons/month

10,950 gallons → Tier 2 = $6.72/1,000 gallons x 10,950 gallons = $73.58/month

$73.58/month * 12months = $882.96/year

Family of four @ 91 gpcpd: 91 x 365 days/year x 1 year/12 months x four people = 11,072 gallons/month

11,072 gallons → Tier 3 = $8.47/1,000gal x 11,072gal = $93.78/month

$93.78/month x 12 months = $1,125.36/year

Annual Savings = $242.40

At first glance, $6.72 versus $8.47 per 1,000 gallons does not appear to constitute much of a difference; however, reducing household water usage by as little as 1 gallon of water per day per person could result in notable savings.

5.2.3 Indoor Water-Use Reduction

CCU encourages conservation of indoor water use through the dissemination of low-flow technologies and multiple regulatory measures. In addition to the conservation reading materials that CCU provides, indoor water conservation kits are given to the local area during community outreach events and for lead and copper sampling sites. These kits include:

- Low-flow showerheads.
- Bathroom aerators.
- Kitchen aerators.
- Toilet flappers.
- Leak detection tablets.
- Water conservation literature and other water conservation-related information.

As Chapter 4 discusses, Charlotte County is expecting significant future population growth. The Charlotte County Code subjects all building developments, at a minimum, to Florida Building Code (FBC) standards and FBC, Plumbing Edition standards. FBC, Plumbing Code Section 604: *Design of Building Water Distribution System*, specifies maximum flowrates for indoor plumbing fixtures such as sinks, faucets, shower heads, lavatories, urinals, and water closets. CCU encourages new residential developments to provide water-efficient fixtures and apparatuses such as shower heads, faucets, toilets, and washing machines.

Similarly, CCU developed the Green Building Program to promote environmentally sensitive construction and development. New and existing commercial, residential, and institutional buildings that adhere to standards set by the program are eligible to permanently display a plaque indicating it is a *Charlotte County Green Building*. Incentives for projects under the Green Building Program can fast-track permitting and increased visibility and marketing. Single-family or commercial buildings are eligible as well as land development projects. CCU plans to continue adopting standards that incentivize current and future landowners to implement measures that minimize the overall usage of available resources, such as water and energy. Additional information about this program is available on the County website.

5.2.4 Outdoor Water-Use Reduction

According to SFWMD, the average Florida household devotes up to 50 percent of daily potable water usage to outdoor irrigation, and more than 50 percent of the water applied is lost due to evaporation or run-off from overspray. CCU is dedicated to limiting potable water use for outdoor activities in tandem with indoor use and has implemented the following:

- Encourages the use of xeriscaping, the practice of designing landscapes to reduce or eliminate irrigation needs.
- Restricts lawn watering with potable water to 2 days per week.
- Enforces watering restrictions according to water management district guidelines.

5.2.5 Water-Loss Reduction

As a good steward of the water supply, CCU is interested in mitigating water loss as much as practical and invests considerably in its water-loss-reduction program. CCU calculates water loss within the distribution system in accordance with the methodology set forth by Subsections 2.3.7.4 and 2.3.1.F.1.a of the SWFWMD and SFWMD WUP *Applicant's Handbooks*, respectively.

SWFWMD requires PWSs to complete PSARs that provide detailed water usage for the PWS. If the PSAR indicates the water loss exceeds 10 percent of the total distribution quantities, a water audit must be completed. Using SWFWMD water-loss calculation methodology, CCU potable water losses in 2021 for the Port Charlotte and Burnt Store Water Systems totaled 7.51 percent and 13.67 percent, respectively.

The Burnt Store Water System has historically experienced potable water system losses greater than 10 percent, and CCU has worked closely with SWFWMD staff to execute mitigation actions and closely monitor system losses resulting from past water audits. In 2015, a water-loss-reduction plan was prepared for the Burnt Store Water System, and since that time CCU has been working directly with SWFWMD staff to implement the plan. CCU has mitigated several sources of water loss through the following efforts:

- Performed a leak analysis throughout the Burnt Store Water System for targeted maintenance.
- Reduced the operating pressure of the system to reduce leaks.
- Installed new fixed-base meters at residential water services and evaluated the accuracy of commercial water meters. As of FY 2020, more than 99 percent of all customer accounts are served using fixed-base meters.

In 2019, Jones Edmunds completed a water-loss investigation report for the Burnt Store Water System and assessed the system after many of the prior mitigation efforts had been implemented. The 2019 investigation determined that the primary source of water loss was background leakage from the distribution system (Jones Edmunds, 2021). Background leakage is generally characterized by a multitude of small leaks at fittings and/or appurtenances that are very difficult to measure independently. In some systems, these small leaks accrue to a significant percentage of total system losses. The investigation demonstrated that the predicted leakage volume for the Burnt Store Water System was greater than 10 percent based on physical characteristics of the system such as distribution main length, service connections, and operating pressure. The investigation concluded that the proportionally high leak volume is due to the relatively low amount of water supplied to this system, which is very likely a result of the water-use demands observed for many of the seasonal residential areas within the system. In short, the expected leakage from the Burnt Store PWS is disproportionally larger than a typical distribution system due to the predictably lower demand, and therefore the 10-percent threshold is similarly disproportionately difficult, if not impractical, to achieve.

The investigation also noted that residential meters may be underreporting water use system wide, although the magnitude of underreporting was not determined. Based on the 2019 investigation, Jones Edmunds recommended that CCU continue its meter testing and replacement program to identify and replace residential meters that are not performing adequately. However, Jones Edmunds did not recommend that CCU expand their efforts to eliminate background leakage, since the predicted leakage volumes were within expected ranges, meaning current efforts were satisfactory.

In August 2021, CCU and SWFWMD met to discuss CCU's efforts to investigate and mitigate water loss in the Burnt Store Water System, specifically regarding the success of SWFWMD-recommended remedial plan actions from 2015. Implementation of these actions and additional CCU-driven measures have not resulted in achieving less than

10-percent water loss in the Burnt Store Water System, and the 2019 investigation predicted similarly high levels of water loss would continue until customer demand increases significantly, which CCU expects to occur in the long term. However, alternative approaches are required in the short term to attempt to meet SWFWMD water-loss goals. As a matter of resolution, SWFWMD recommended that CCU continue water-loss-reduction efforts to include the following:

- Continue meter replacement with a focus on apparent no-use and low-demand customers identified in the 2019 investigation (ongoing).
- Assess whether meter read errors or post-read data errors are affecting billing integrity (ongoing).
- Create Standard Operating Procedures (SOPs) to identify potential meter read errors, post-read data errors, and other discrepancies in the billing process (ongoing).
- Track monthly revenue water and non-revenue water for each system (ongoing).

5.2.6 Reclaimed Water System Expansion

Reclaimed water can be used to offset potable water demands in various construction, industry, and residential applications. The most common use of reclaimed water for offsetting potable water demands in Charlotte County is for irrigation applications. CCU was an early promoter of reclaimed water, connecting its first reclaimed water customer in the 1990s. Since then, CCU has made significant investments in expanding its public-access reuse systems and encouraging the use of reclaimed water as an alternative to potable water where applicable and economical. CCU currently prioritizes large users such as golf courses, athletic complexes, and condominiums where significant potable water offsets can be achieved. Targeting large irrigation users lessens the demand on local water supply sources since although large users may not rely on potable water for irrigation, they do use significant amounts of groundwater as an alternative. However, CCU does not currently nor does it have plans to distribute reclaimed water to detached single-family homes due to limited reclaimed water supply and the costly investment in installing and operating separate reclaimed water distribution systems.

Customers receiving reclaimed water or separate groundwater from irrigation wells must provide backflow prevention in accordance with CCU's CCCP program, which is also required under Florida law. In some cases, this can be costly and deter large users from connecting to reclaimed water system. This should be considered with developing the CCU's CCCP requirements. Another challenge CCU faces when securing new customers is the ability for large users to obtain their own WUP for private irrigation wells. Large developers can request a WUP from SWFWMD that if approved undercuts the utilities' ability to expand reclaimed water use and works against SWFWMD's goals of promoting reclaimed water and reducing groundwater withdrawals.

CCU encourages larger irrigation users to connect to the reuse systems by educating developers and through a separate reclaimed water rate structure, presented in Table 5-2.This rate structure encourages the use of reclaimed water for irrigation by selling it at a fraction of the cost of potable water even though it is more expensive to produce. Like the potable water system, the rate structure is tiered, but in this case it is a decreasing-block rate schedule. The decreasing-block rate schedule was adopted in 2016 to further encourage the use of reclaimed water from major users. At the time of adoption,

even nominal revenue generation from higher tiers was considered more beneficial than the alternative of disposing of reclaimed water, which incurs expenses from O&M and pumping.

Table 5-2 CCU Utility Rate Structure for Reclaimed Customers

Utility Service/Rate Tier[1]		Gallonage Charge per 1,000 Gallons
RECLAIMED WATER (REUSE)		
Pond Delivery:		
Tier 1)	0 – 3,000,000 gallons	$0.24
Tier 2)	3,000,001 – 9,000,000 gallons	$0.18
Tier 3)	9,000,001 – 30,000,000 gallons	$0.15
Tier 4)	30,000,001 gallons and above	$0.13
Direct Feed:		
Tier 1)	0 – 3,000,000 gallons	$0.36
Tier 2)	3,000,001 – 9,000,000 gallons	$0.31
Tier 3)	9,000,001 – 30,000,000 gallons	$0.28
Tier 4)	30,000,001 gallons and above	$0.24

[1]Rate table does not include applicable base facility charges. CCU maintains complete current rate schedules on their publicly accessible website https://www.charlottecountyfl.gov/.

Currently, no watering restrictions or limitations exist for reclaimed water, as CCU would prefer to sell reclaimed water than to dispose of it through non-revenue-generating alternatives. As the *Reclaimed Water Master Plan* (Jones Edmunds, 2022) discusses, the need and value of reclaimed water will increase as water resources become more limited, and adjustments to the rate schedule should be considered.

5.2.7 Emergency Water-Shortage Provisions

The final component of CCU's WCP is a water-loss-reduction program. CCU fully supports the water conservation efforts of SWFWMD and SFWMD, especially during times of water shortages, and has adopted Ordinance No. 2020-045 to enforce in the water conservation efforts and water-use restrictions enacted by the districts. In past years, the districts have issued temporary regional and state-wide declarations of water restrictions and permanent year-round water conservation measures. The districts identify water shortages as Phase I (moderate), Phase II (severe), Phase III (extreme), or Phase IV (critical), where ascending phases are typically indicative of more stringent restrictions.

For the portion of Charlotte County where CCU provides service, Charlotte County follows SWFWMD Conservation Measures as posted on their website https://www.SWFWMD.state.fl.us/. For portions of Lee County where CCU provides service, Charlotte County follows SFWMD Conservation Measures as posted on their website https://www.sfwmd.gov/community-residents/landscape-irrigation.

If a water shortage or emergency water shortage is declared by SWFWMD and/or SFWMD, CCU notifies its customers of the shortage and water restrictions immediately by various media and public information resources, including:

- Paid newspaper display advertisements.
- Public service announcements and press releases.

- Direct mail and direct flyers, locally and regionally.
- Customer bill messages.
- Public activity booths.
- Civic group presentations.
- Charlotte County and CCU websites.

CCU Ordinance No 2020-045 subjects all applicable Charlotte County water users to the water conservation measures adopted by SWFWMD and/or SFWMD and enforces penalties in accordance with applicable Florida codes and regulations. The enforcement allows CCU staff to progressively enforce water restrictions for CCU customers, including written warnings with educational materials and escalating unauthorized water-usage charges for repeat offenses. Table 5-3 shows the charges that appear on customer's water bills.

Table 5-3 Penalties for Violation of Emergency Water Conservation Provisions

Offense	Penalty
When written warnings are not prohibited by SWFWMD:	
a. First offense:	Written warning
b. Second offense:	$200.00 fine
c. Third and subsequent offenses:	$300.00 fine
When written warnings are prohibited by SWFWMD:	
a. First offense:	$100.00 fine
b. Second offense:	$200.00 fine
c. Third and subsequent offenses:	$300.00 fine

5.3 CCU Program Assessment

The following section discusses the effectiveness of CCU's WCP to use the available public water supply most efficiently and effectively. The assessment is based on a review of trends in potable water use, reclaimed water use, and non-revenue water use and loss. The assessment also reviews potential water-saving technologies and techniques to supplement CCU's existing program.

5.3.1 Potable Water-Use Trends

The historical water use rate is the population-related withdrawals or water imports associated with metered connections. The water-use rate is the most common metric used by utilities and water management districts to estimate the effectiveness of a utilities' water conservation program and is determined from the PWS's gross water use and functional population.

Table 5-4 and Table 5-5 display the gross water use from 2015 to 2021 for the Port Charlotte and Burnt Store Water Systems, respectively, as reported in the annual PSARs. As discussed in Section 3.1, the Port Charlotte Water System is a consecutive system and supplies water to other PWSs. Accordingly, the gross water use is calculated from the imported PRMRWSA water minus exported water sent to other PWSs and water treatment loss. By comparison, the gross water use for the Burnt Store Water System is calculated as the total groundwater withdrawal from the Burnt Store wellfield minus the water treatment losses at the Burnt Store WTP.

Table 5-4 Port Charlotte Water System Water Use from 2015 to 2021

Year	Total Imported Water (gallons)	Total Exported Water (gallons)	Water Treatment Loss (gallons)	Gross Water Use (gallons)
2015	10,265,704	294,956	Data Not Available	9,970,748
2016	10,537,994	289,191	102,488	10,146,315
2017	11,085,499	395,440	106,901	10,583,158
2018	10,210,890	281,548	99,293	9,830,049
2019	10,460,321	410,587	99,431	9,950,303
2020	10,659,738	409,601	102,501	10,147,636
2021	11,580,816	271,948	113,089	11,915,779

Table 5-5 Burnt Store Water System Water Use from 2015 to 2021

Year	Total Withdrawal (gallons)	Water Treatment Loss (gallons)	Gross Water Use (gallons)
2015	552,000	115,728	436,272
2016	527,097	126,153	400,944
2017	551,972	117,556	434,416
2018	535,509	108,987	426,522
2019	553,240	123,705	429,535
2020	588,678	123,703	464,975
2021	606,204	129,875	476,329

In the previous tables, reported *water treatment loss* is different than the *water loss* discussed in Section 5.2.5. SWFWMD defines water treatment loss as the difference of water into and out of the WTP, whereas water loss is within the distribution system. For the consecutive Port Charlotte Water System, CCU began accounting for water treatment loss in 2016 using an assumed 1 percent of the difference of the imported and exported water since SWFWMD also allows a 1-percent deduction for flushing and sampling distribution lines for potability. In practice, flushing and sampling volumes may exceed 1 percent to meet potable water quality standards depending on the distribution system configuration and characteristics.

Table 5-6 displays the functional population of each system as reported in the annual PSARs. The functional population is the served permanent population adjusted by the seasonal resident, tourist, group quarters, and net commuter population within a utility's service area (SWFWMD, 2009).

Table 5-6 Port Charlotte and Burnt Store Water Systems' Functional Population

Year	Peace River Functional Population	Burnt Store Functional Population	Total Functional Population
2015	126,346	6,827	133,173
2016	128,961	6,794	135,755
2017	130,349	6,873	137,222
2018	132,185	7,017	139,202
2019	134,412	7,186	141,598
2020	137,800	6,941	144,741
2021	141,174	7,383	148,557

SWFWMD limits each water-use permittee to a per-capita water-use rate of 150 gpd. If a PWS exceeds this amount, then the permittee must implement a phased reduction plan, implement water conservation measures, and monitor the water use rate by submitting annual PSARs and Reclaimed Water Supplier Reports. Table 5-7 displays the per-capita usage from 2015 to 2021 for the Port Charlotte and Burnt Store Water Systems. The historical 5-year average daily water use rates for the Port Charlotte and Burnt Store Water Systems are 76 and 63 gpd, respectively.

Table 5-7 Port Charlotte and Burnt Store Water Systems' Per-Capita Water-Use Rate

Year	Peace River Water Use Per Capita (gpd)	Burnt Store Water Use Per Capita (gpd)
2015	79	64
2016	79	59
2017	81	63
2018	74	61
2019	74	60
2020	74	67
2021	79	65

Table 5-8 summarizes the daily water use per capita across Florida's water management districts in comparison to CCU for 2020. In 2020, SWFWMD reported the lowest per capita use in the state at 100 gpcd. Both CCU PWSs had water use rates per capita at least 25 percent below their average PWS peer in SWFWMD and 40 percent below their average peer PWS statewide. In other words, per capita SWFWMD PWSs are using significantly less water than the statewide average, and CCU is using significantly less water than the average SWFWMD PWS.

Table 5-8 Regional and State-Wide Per-Capita Usage in 2020

Entity	Daily Water Use Per Capita[1] (gpcd)
Burnt Store Water System	67
Port Charlotte Water System	74
SWFWMD	100
NWFWMD	125
SFWMD	128
SJRWMD	116
SRWMD	124
State-Wide Average	**123**

[1]Data from *2020 Water Conservation Summary Report (SWFWMD, 2021b)*.

The presented water-use trends clearly demonstrate that although the functional population is much larger for the Port Charlotte Water System compared to the Burnt Store Water System, both are characterized by per-capita water-use rates that show little variation since 2015 and are significantly lower than their peer PWSs in SWFWMD and across the state. Using the per capita water-use rate as a surrogate to measure the effectiveness of water-conservation efforts, CCU performs very well compared to its peers. Additionally, CCU's gross per-capita water use is consistently the second lowest of the PRMRWSA members.

Table 5-9 and Table 5-10 list the 10 largest potable water customers and the corresponding percentage of total water consumption for the Port Charlotte and Burnt Store Water Systems, respectively. In some cases, potable water demands can be reduced by providing reclaimed water to large industrial or irrigation users. The largest customers in the Port Charlotte Water System include bulk (i.e., other utilities), commercial, and industrial customers; the largest water users in the Burnt Store Water System are residential developments. The commercial and industrial customers in the Port Charlotte Water System are primarily health facilities that cannot use reclaimed water as an alternative.

Table 5-9 Port Charlotte Water System 2021 Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)	Percentage of Total Water Sales
Riverwood Development Inc.[1,2]	58,047	1.4
El Jobean Water Association[2]	27,230	0.6
Little Gasparilla Water Utility[1,2]	16,224	0.4
Fawcett Memorial Hospital	13,107	0.3
Shorepoint Health – Port Charlotte	10,799	0.3
Shorepoint Health – Port Charlotte	10,486	0.2
Homeowners of PC Village	10,413	0.2
Fawcett Memorial Hospital	10,040	0.2
Placida Harbour Club	9,256	0.2
Encore Super Park, Port Charlotte[2]	8,562	0.2
Total 10 Largest Users	**174,164**	**4.1**
All Other System Users	4,052,833	95.9
Total System Water Sales	**4,226,997**	**100**

Note: [1]Denotes water customers only; all others listed are system water and sewer customers.
[2]Bulk users.

Table 5-10 Burnt Store Water System 2021 Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)	Percentage of Total Water Sales
Grande Isle Towers I & II Condo Assoc., Inc.	3,337	1.9
WCI Communities, Inc.	3,316	1.9
Florida Design Communities	2,626	1.5
SHM Burnt Store, LLC	2,138	1.2
SHM Burnt Store, LLC	1,863	1.1
Keel Club Condo Association, Inc.	1,506	0.9
VSTA DL SOL RST@BS MRNA Condo	1,364	0.8
Acapulco Gardens LLC	959	0.6
Spinnaker Club Condos	949	0.5
Marina Towers Improvement Company	879	0.5
Total 10 Largest Users	**18,937**	**11**
All Other System Users	153,633	89
Total System Water Sales	**172,570**	**100**

Understanding the distribution of large water users in the Port Charlotte and Burnt Store Water Systems is key in determining where conservation efforts can be directed. The number of connections and user types are also relevant information when planning future water demands since water use varies for residential, commercial, and industrial customers. The Port Charlotte Water System supplies water to approximately 2,390 connections for industrial and commercial use and 101 connections classified as recreational and aesthetic use. The Burnt Store Water System supplies water to approximately 60 connections for industrial and commercial use and four connections classified as recreational and aesthetic use.

Figure 5-1 and Figure 5-2 show the historical growth CCU has seen in connection types as reported in the respective PSARS. Single-family DUs have had the largest most consistent growth from 2015 to 2021 compared to all other connection types. Neither system has connections that use potable water for agriculture or golf course irrigation since the agricultural areas and golf courses typically have their own supply wells or, in the case of golf courses, are provided reclaimed water since this has been promoted by CCU's water conservation efforts. A significant drop in the number of single-family DUs in the Burnt Store Water System in 2020 may be due to the Covid-19 pandemic or an accounting error; however, they exceeded pre-pandemic numbers the following year, 2021.

Figure 5-1 Connection and User Types for the Port Charlotte Water System

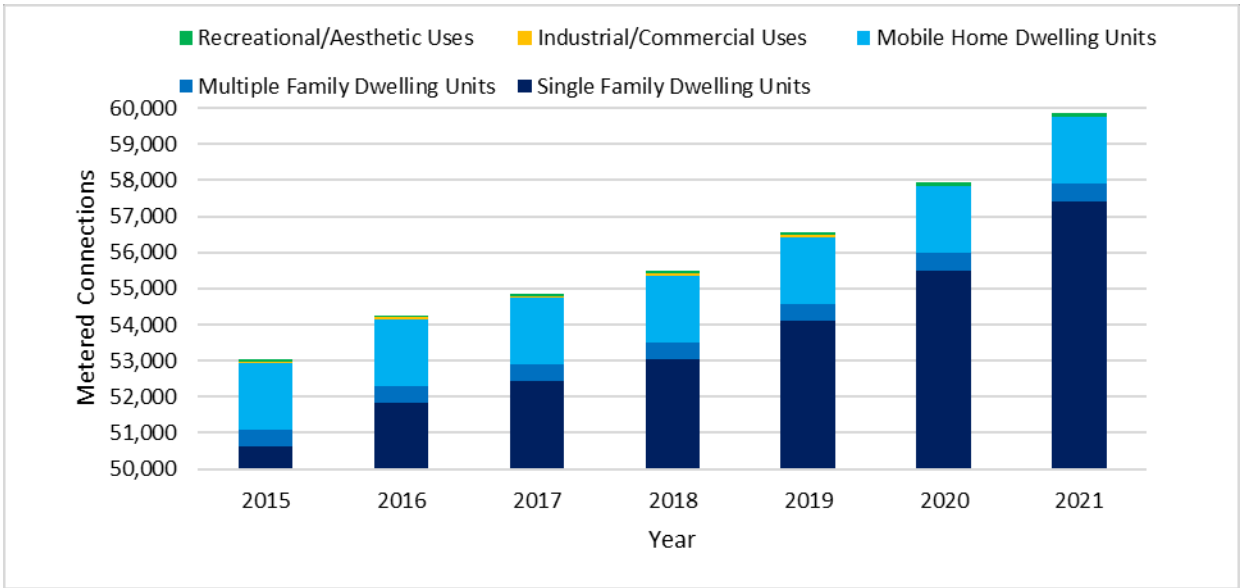
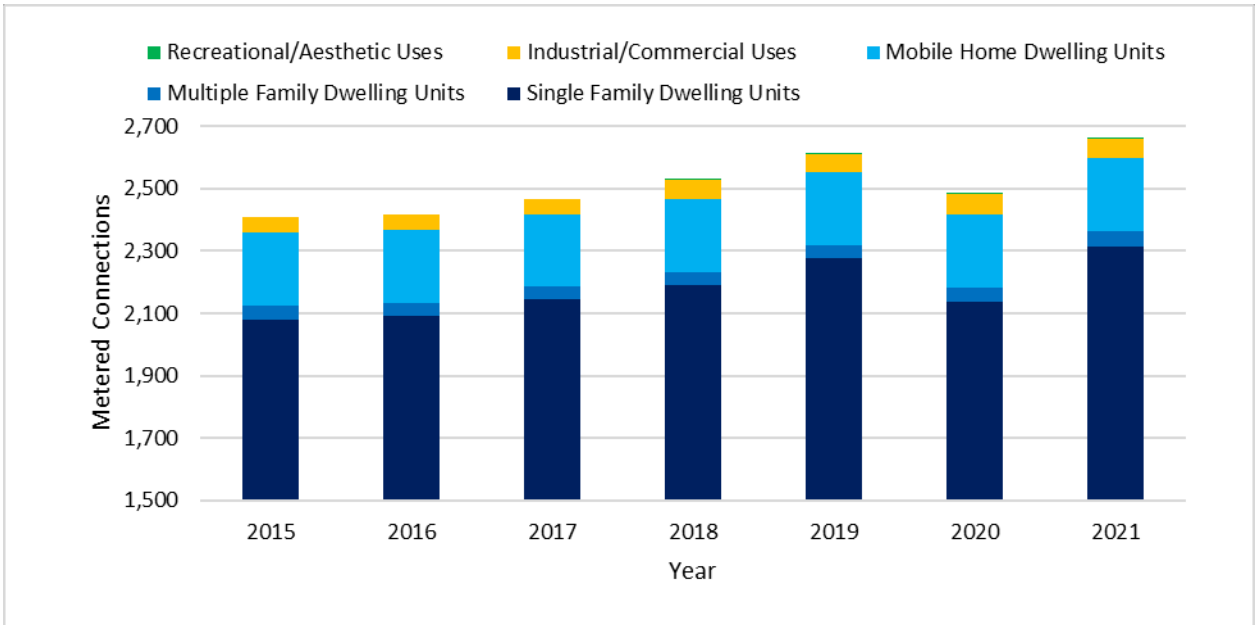


Figure 5-2 Connection and User Types for the Burnt Store Water System



5.3.2 Reclaimed Water Use Trends

Although reuse of reclaimed water can have several benefits in terms of water conservation, reclaimed water use is presumed to offset potential potable water use. Therefore, to further support water conservation efforts, CCU continues to encourage the use of reclaimed water by identifying new reclaimed water users (particularly large users), continuing reclaimed water service contracts, and selectively expanding reclaimed water distribution infrastructure. Table 5-11 summarizes CCU's current and future (pending) user agreements

as reported in the *Reclaimed Water Master Plan* (Jones Edmunds, 2022). The contracts are contingent on the available reclaimed water supply, which varies seasonally.

Table 5-11 CCU Reclaimed Water Agreements as of 2021

Service Area	Current Agreements	Future Agreements	Total Agreements
Mid County	21 connections 3.013 MGD	8 connections 2.021 MGS	29 connections 5.034 MGD
West County	29 connections 2.635 MGD	15 connections 4.7 MGD	44 connections 7.335 MGD
South County	7 connections 0.45 MGD	8 connections 3.5 MGD	15 connections 3.95 MGD
TOTAL	**57 connections 6.1 MGD**	**31 connections 10.2 MGD**	**88 connections 16.3 MGD**

Figure 5-3 and Figure 5-4 plot the relationship between per capita water usage and reclaimed water use for the Port Charlotte and Burnt Store Water Systems, respectively. For these figures, per capita water use is displayed on the left vertical axis and reclaimed water flow is read from the right vertical axis. Historical water-use rates were obtained from PSAR data and reclaimed water flows from the WRF discharge monitoring reports (DMRs). Reclaimed water use was expanded between 2011 and 2021 and will continue to grow as indicated by the future agreements summarized above.

Figure 5-3 Port Charlotte Water System – Reclaimed Water Reuse Impacts on Water Usage

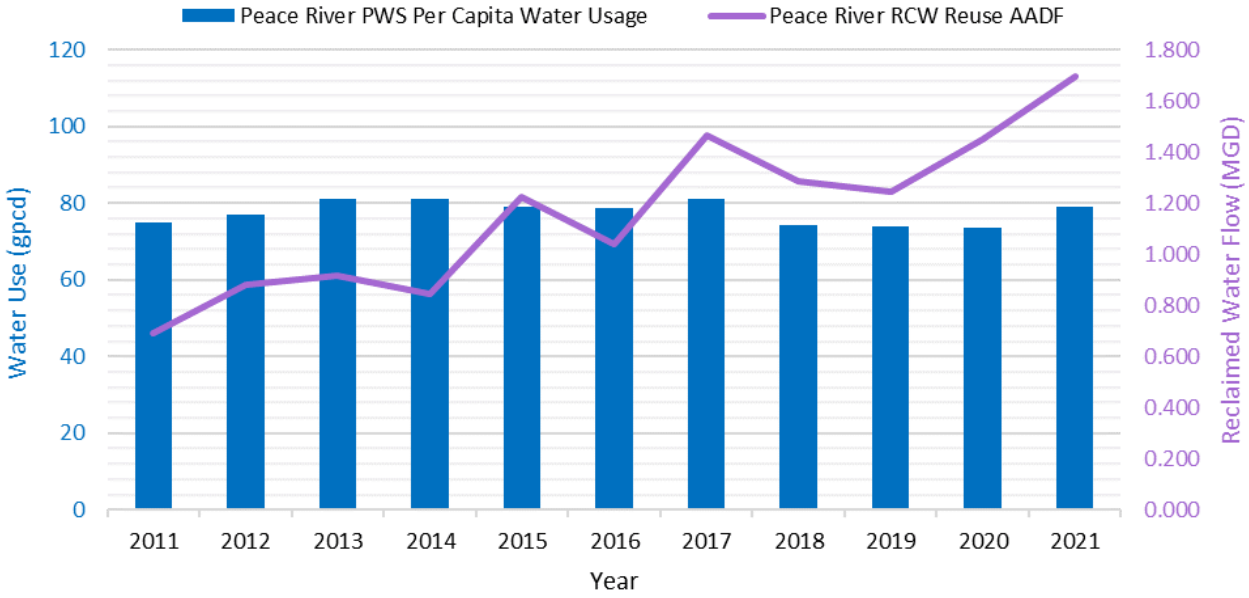
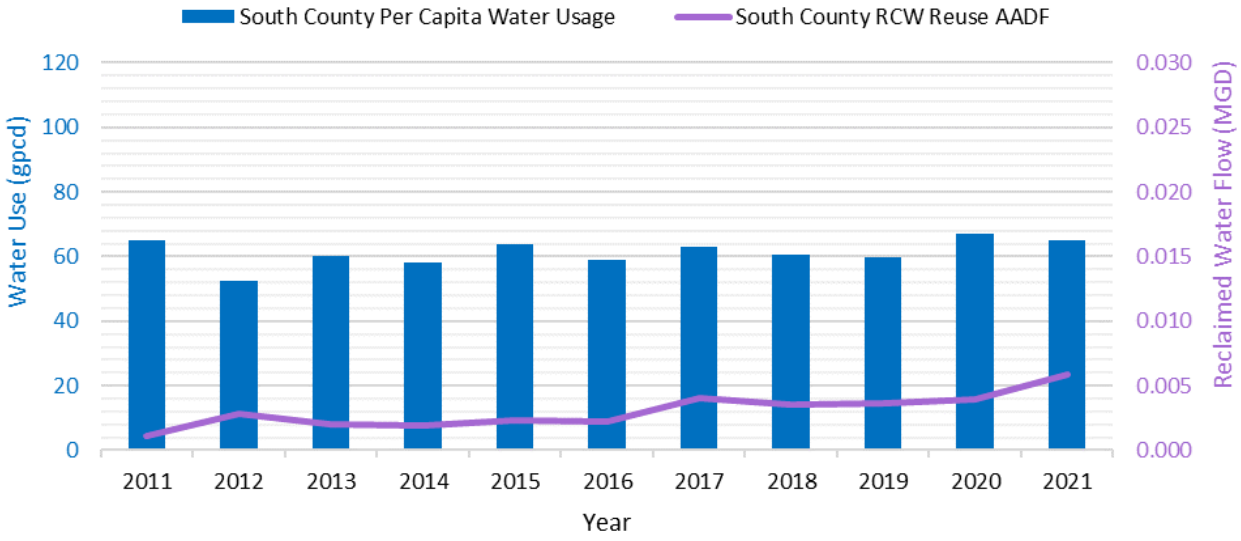


Figure 5-4 Burnt Store Water System – Reclaimed Water Reuse Impacts on Water Usage



Contrary to what is expected, an increase in reclaimed water use has had no effect on the per capita usage of potable water in both the Port Charlotte and Burnt Store Water Systems in Charlotte County. This relationship, along with the fact that Charlotte County's water usage is among the lowest of its peers, suggests that CCU's water conservations efforts in this period were so effective that additional water-saving measures (like using reclaimed water) have diminishing returns. Continuing to expand the reuse system for residential users would not have a significant impact on the County's water conservation goals but would incur additional construction and maintenance costs. Increasing access to reclaimed water for large users and new large developments is more beneficial.

The larger user data discussed in Section 5.3.1 indicate that CCU has already converted its major industrial and irrigation users to reclaimed water where applicable and that little additional potable water can be conserved from the existing customer base. Currently, the largest users are golf courses and residential developments, and this trend will likely continue as indicated by the data in Figure 5-3 and Figure 5-4. If the current conservation efforts remain in place, the use of reclaimed water will not have an impact on the per-capita usage of the new developments.

5.3.3 Non-Revenue Water Use Trends

Part of CCU's water conservation program includes monitoring, reporting, and quantification of water use. The data are used to determine the amount of revenue and non-revenue water each system generates. Non-revenue water use includes accounted-for sources, including municipal uses such as emergency services and distribution main flushing, as well as unaccounted-for sources such as various types of water loss from the distribution system. Figure 5-5 and Figure 5-6 depict the total water purchased or produced, water sold, accounted-for water uses (including from construction, firefighting, hydrant flushing, and line breaks), and unaccounted-for water from 2010 to 2021 for the Port Charlotte and Burnt Store Water Systems, respectively.

Figure 5-5 Port Charlotte Water System Water-Use Report

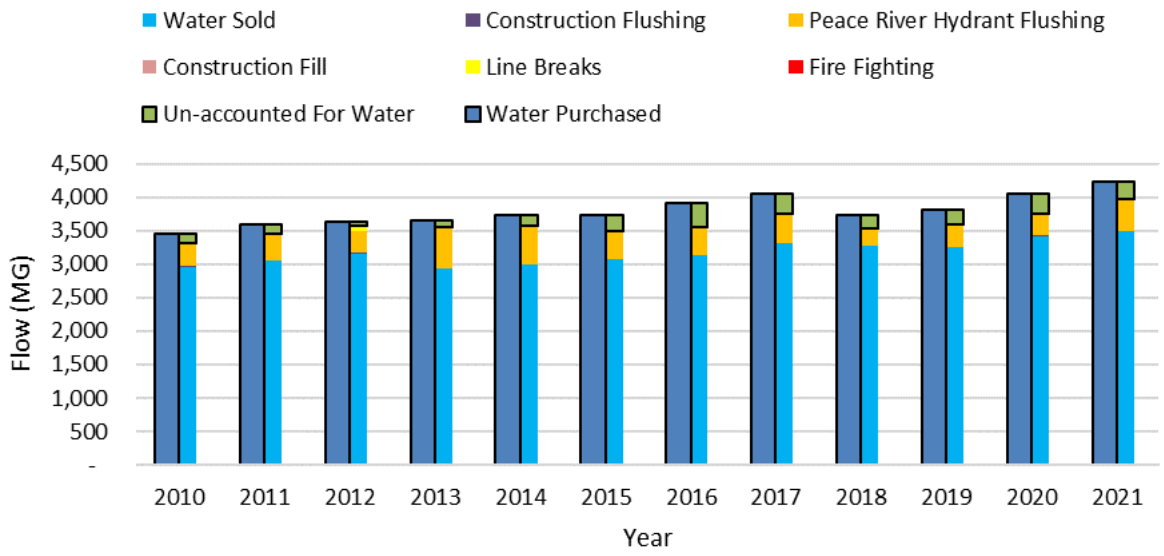
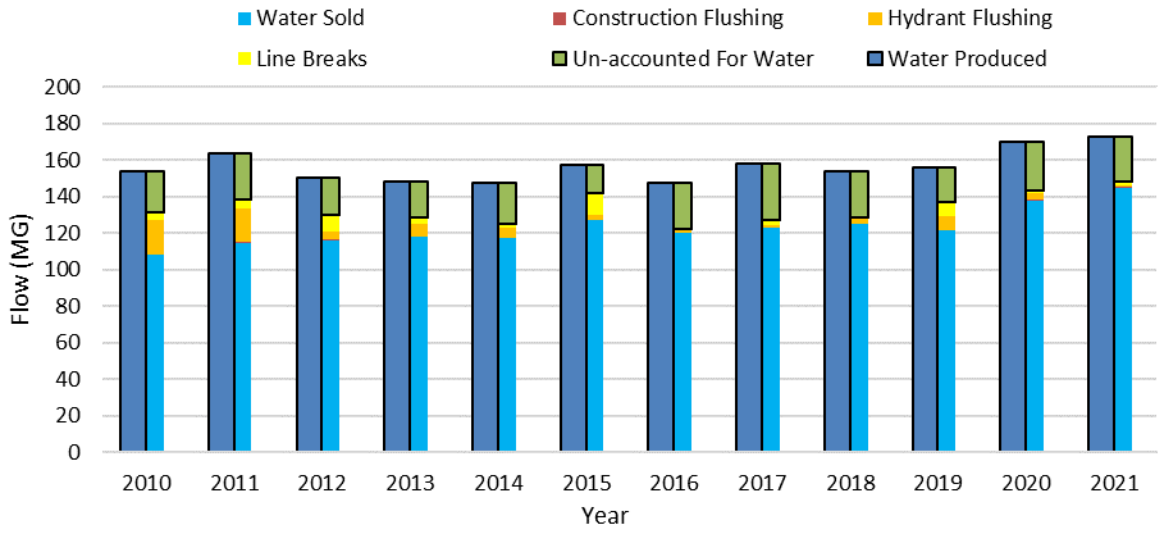


Figure 5-6 Burnt Store Water System Water-Use Report

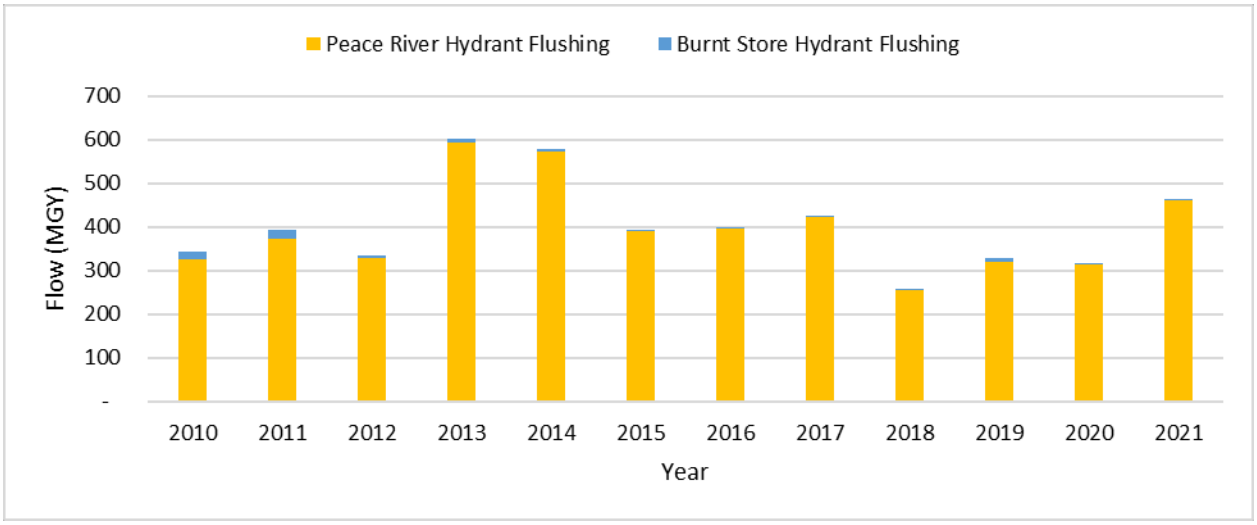


Unaccounted-for water is the second-largest water use category in the Burnt Store Water System and third largest category in the Port Charlotte Water System. The Port Charlotte Water System meets SWFWMD water-loss standards and the Burnt Store Water System does not. However, as discussed in Section 5.2.5, CCU has undertaken several efforts to reduce water losses in Burnt Store Water System including ongoing efforts related to refining billing methods, reviewing the accuracy of the flow-metering devices, and using new tools to optimize and refine data reporting. Given that the Port Charlotte Water System meets the water-loss standards and the level of effort previously invested into mitigating water loss for Burnt Store Water System, the potential water-use savings from additional water-loss mitigation is likely limited for both systems.

Hydrant flushing is the second largest water-use category in the Port Charlotte Water System and is the intentional cycling of fresh potable water through specific areas of the

distribution system. Since flushing does not generate revenue or provide an environmental benefit, CCU strives to minimize unnecessary flushing as a good steward of their water supply. However, CCU must perform hydrant flushing to maintain the appropriate disinfectant residual throughout the distribution system in accordance with drinking water standards. Figure 5-7 displays the estimated total flushing volumes from the Port Charlotte and Burnt Store Water Systems based on historical data available from 2010 to 2021.

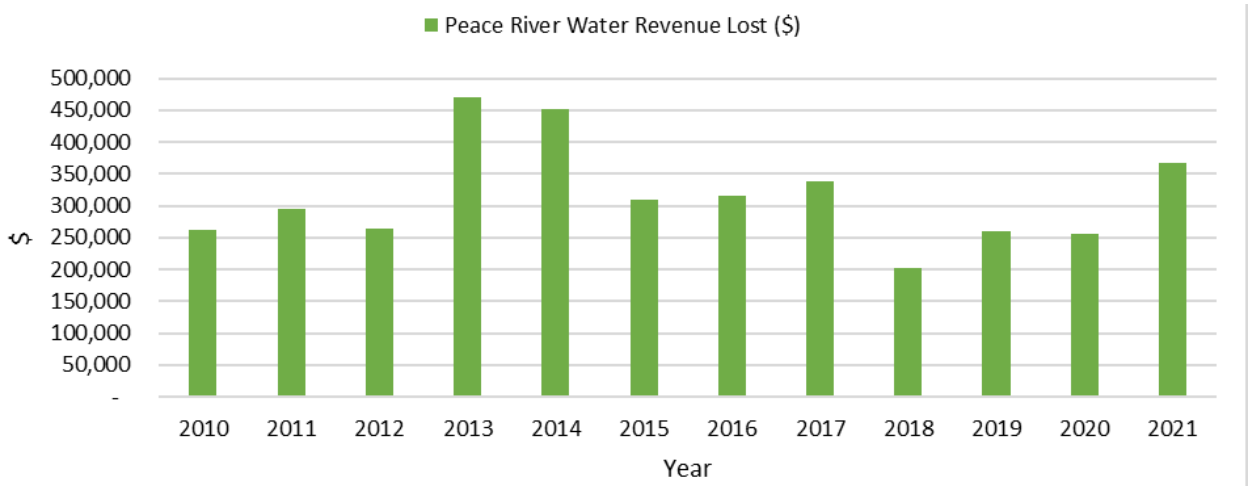
Figure 5-7 Historical Port Charlotte and Burnt Store Water System Flushing Quantities



Direct comparisons for quantifying the cost of flushing are difficult to obtain since treatment, equipment, and labor costs can contribute to CCU's flushing expenses, but in the case for the Port Charlotte Water System a basic comparison can be made since it is a consecutive system and purchases water from PRMRWSA. Figure 5-8 displays the historical expenses incurred by CCU from its flushing activities for the Port Charlotte Water System. The figure shows that approximately $3,800,000 have been lost from 2010 to 2021 on an average of $316,667 per year (based on $0.79 per 1,000 gallons). The value is a conservative estimate since it does not account for O&M expenses (conveyance, labor, etc.) or the revenue that could be generated if the water were sold.

The *2008 CCU Water Supply Master Plan* (Stantec, 2008) reported that CCU has effectively reduced the number of flushing occurrences since 1995 by improving chlorine residual in the system. However, additional improvements are achievable and CCU continues to implement other strategies for maintaining acceptable water quality within distribution mains while minimizing flushing volumes. Chapter 8 further discusses potential alternative approaches to flushing.

Figure 5-8 Historical Port Charlotte Water System Flushing Expenses



The *2008 CCU Water Supply Master Plan* (Stantec, 2008) reported that CCU has effectively reduced the number of flushing occurrences since 1995 by improving chlorine residual in the system. However, additional improvements are achievable and CCU continues to implement other strategies for maintaining acceptable water quality within distribution mains while minimizing flushing volumes. Chapter 8 further discusses potential alternative approaches to flushing.

Construction flushing and fill do not account for a significant percentage of water use for either CCU system. *Construction flushing* is the practice of flushing newly built or renovated water lines upon project completion to clear them of stagnant water, and *construction fill* refers to the water used on construction sites, often brought in on watering trucks and used for dust control. Reclaimed water is a potential replacement to potable water for construction fill, not construction flushing. However, these water uses contribute very little to CCU's overall water use and alternative water and/or additional conservations efforts targeting construction activities are not likely to result in significant water use savings.

Lastly, CCU estimates water use from fighting fires and from large pipe breaks using empirical formulas typical of industry best practices. Based on these estimates, water use for fighting fires does not account for a significant percentage of water use in the Port Charlotte Water System and is not reported in the Burnt Store Water System. By comparison, water loss from large pipe breaks was not a significant water use in the Port Charlotte Water System but was a significant use of water in the Burnt Store Water System. To minimize the potential for future pipe breaks in the Burnt Store Water System, CCU has reduced the system operating pressure. Targeted preventative maintenance and reduced operating pressure are the BMPs to reduce large breaks in the Burnt Store Water System. Reclaimed water use and/or alternative practices not currently pursued are unlikely to reduce water use from these sources.

5.3.4 Potential Water-Saving Technologies and Techniques

SWFWMD has identified additional water conservation options for non-agricultural water users (*Regional Water Supply Plan*; SWFWMD, 2015). Table 5-12 and Table 5-13 list some of the most relevant technologies and techniques available to CCU, respectively.

Table 5-12 Potential Water-Saving Technologies

Technology	Flow Rate (gpm)
High-Efficiency Showerhead and Faucet Aerator Rebates	Bathroom – 1.5 Kitchen/showerheads – 2.5
Ultra-Low-Flow Toilet/High-Efficiency Toilet Rebates (Residential, Commercial, Institutional)	1.6 / 1.28 gallons per flush
Low-Flow Urinals and Waterless Urinals (Industrial, Commercial, and Institutional)	1.0 gallon per flush
Pre-Rinse Spray Valve (Industrial, Commercial, Institutional)	1.6
Irrigation Controller: Evapotranspiration, Soil-Moisture, and Rain Sensors	Monitor site conditions and irrigate as necessary.

Table 5-13 Potential Water-Saving Techniques

Technique	Description
Landscape and Irrigation Evaluation/Audits	Evaluate landscape systems to identify areas to improve operations, repair leaks, and or redesign.
Water-Wise Florida Landscape Efficiency Audit	Conduct evaluations to replace high water consumption turf and shrubs with a *water-wise* climate appropriate plant with a rebate as an incentive.
Water Use Facility Assessments/ Audit (Industrial, Commercial, and Institutional)	Evaluate water use at non-residential facilities to identify areas to improve efficiencies.
Graywater Technologies	Install and encourage the use of graywater technologies that are proven to conserve approximately 10,000 to 50,000 gallons of potable water per year.
Encourage Private Utilities to Conserve	Private utilities within the CCU service area are not required to abide by the conservation plan, but they can be encouraged.

5.4 SUMMARY AND RECOMMENDATION

Water conservation is a mandatory requirement for PWSs in Florida. CCU's WCP includes public education and outreach, a variable rate structure, indoor and outdoor water-reduction practices, water-loss mitigation measures, reclaimed water expansion program for large users, and provisions for emergency water shortages. A successful WCP reduces potable demand, prolongs the useful life of potable water supply sources, and improves community understanding of water resources. Both the Port Charlotte and Burnt Store Water Systems exhibit consistently low water use per capita compared to other peer PWSs in SWFWMD and across the state. By these standards, CCU has a very successful WCP and should continue promoting the program and implementing water-conservation BMPs. In addition, CCU should continue to improve and explore methods for reducing hydrant flushing. However, given the current low water use per capita and secondary impacts for limiting flushing, future water use will likely not be significantly lower, suggesting that water-use demand will grow proportionally with population increases. Based on this assessment, CCU should continue to investigate potential alternatives for meeting future water demands.

6. WATER SUPPLY OPTIONS

OVERVIEW

This chapter evaluates the feasibility of five regional water supply options for meeting the future water demand projections for the Port Charlotte and Burnt Store Water Systems as identified in Chapter 4. A brief description, regulatory and legal considerations, and a list of advantages and disadvantages are provided for each option. The information was gathered and used to conduct a qualitative analysis for each of the water-supply options for each system. The chapter concludes with near-term and long-term recommendations for addressing water supply. Although the report presents the topics chronologically, this chapter was continually developed through several workshops with CCU and through iterative modeling efforts with the goal of identifying the most economically, technically, and environmentally feasible options for increasing CCU's water supply.

6.1 USE BABCOCK RANCH SUPPLY

6.1.1 OVERVIEW

One potable water supply option for addressing CCU's future water demands is to develop a new water supply source at the Babcock Ranch Preserve, which is in East County, spanning approximately 56,000 acres. In 2005, Kitson & Partners (MSKP, 2006) completed a deal with the State of Florida to sell the majority of the Babcock Ranch land for environmental-preservation efforts, keeping a portion to develop the Babcock Ranch community. As part of the agreement, pursuant to Chapters 253 and 259, FS, and Chapter 18-2, FAC, Charlotte County was reserved the right to use the lands for developing public water supplies, subject to the conditions of executed agreements. However, the contract limits construction of infrastructure associated with withdrawal of groundwater – water treatment facilities must be constructed offsite of the Babcock Ranch Preserve.

Later, Charlotte County applied for a WUP and in 2011 was issued a 20-year secondary use WUP (WUP #08-00129-W) for the Babcock Ranch Wellfield that authorizes emergency-based annual and monthly maximum withdrawals of 372 MG (approximately 1.0 MGD) and 93 MG (3.0 MGD). The current WUP authorizes construction of three proposed groundwater withdrawal wells, but no CCU infrastructure currently exists near Babcock Ranch besides monitoring and sampling wells installed as part of the WUP application process. Table 6-1 demonstrates the sustainability/limitations of the Babcock Ranch water supply under the current WUP agreement.

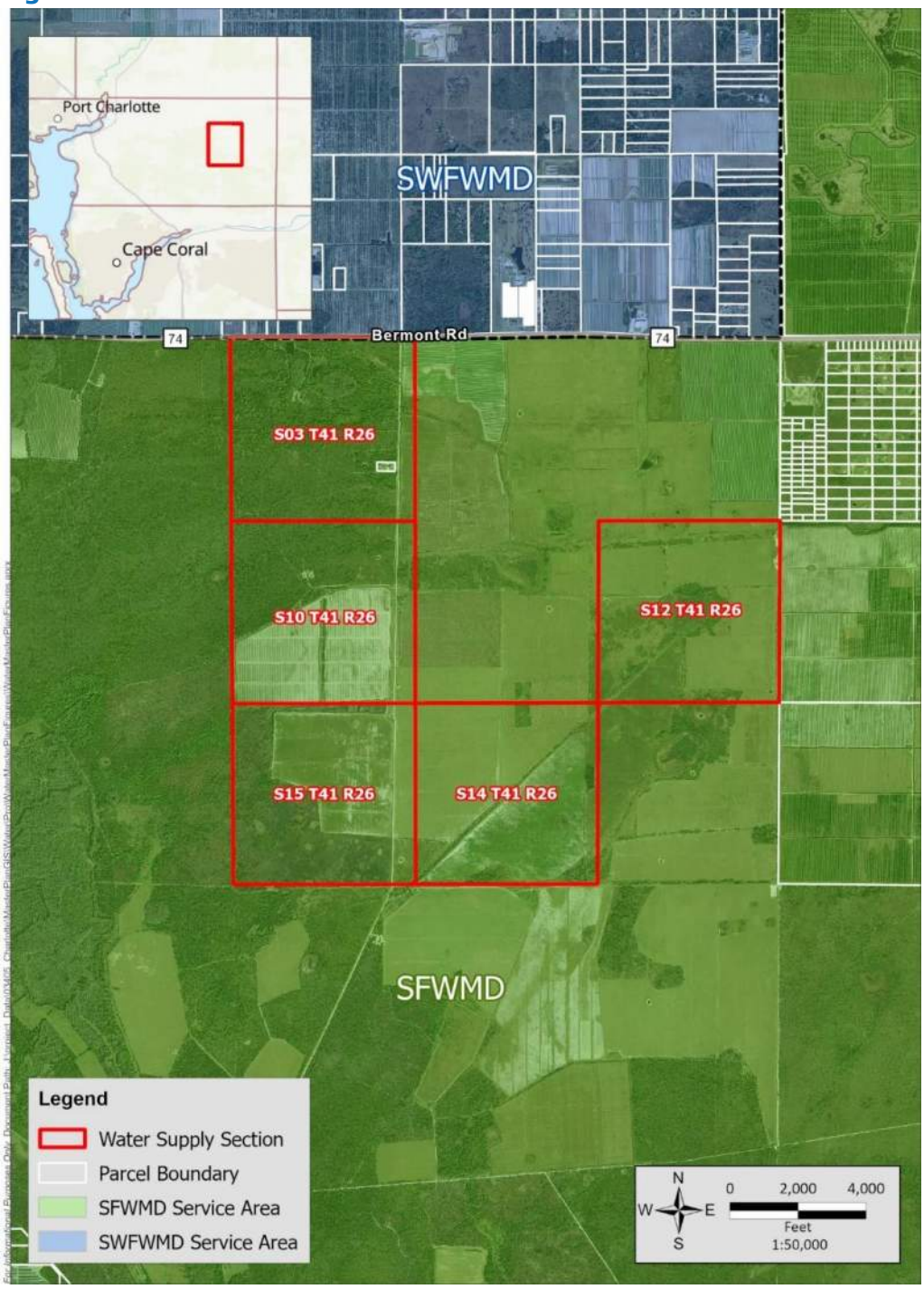
Table 6-1 Babcock Ranch Wellfield Current Secondary Use WUP Allocation

Allocation Factor	Maximum Annual Withdrawal Conditions	Maximum Monthly Withdrawal Conditions
WUP Allocation	372 MG	93 MG
Equivalent Daily Allocation	1.019 MGD	3.0 MGD[1]
Sustainability/Limitations[2]	Year-round (365 days/year)	4 Months/year[1] (124 days/year[1])

[1] Value assumes 31 days per month; [2] With respect to maximum annual withdrawal of 372 MGD.

The existing WUP will expire on December 19, 2031. To supplement future CCU water demands with water supply from Babcock Ranch, the WUP will need to be re-opened and renewed as a primary use WUP. The existing WUP already identifies specific survey sections for water supply development in SFWMD as Sections 3, 10, 12, 14, and 15 of Township 41 South, Range 26 East. Figure 6-1 shows these sections. The proposed location for the Babcock Ranch Wellfield is approximately 21 miles from the nearest Port Charlotte Water System connection and 24 miles from the nearest Burnt Store Water System connection with respect to existing CCU infrastructure.

Figure 6-1 Authorized Sections for Babcock Ranch Wellfield Development



Before the existing WUP acquisition, the *County-Wide Water Supply Master Plan* (Stantec, 2008) initially determined that the Babcock Ranch Wellfield may safely yield up to 20 MGD, with 6 MGD noted as reserved for the Babcock Ranch community based on buildout conditions. Consequently, up to 14 MGD were believed to be sustainably available for withdrawal by CCU. Johnson Engineering completed a more current Babcock Ranch Water Supply study in 2022. Preliminary results indicate that Babcock Ranch water supply can provide up to 32 MGD of raw water yield from the upper Floridan aquifer. Table 6-2 presents the maximum potential groundwater withdrawal allocations that could be applied for under a standard 20-year-term primary use WUP with respect to 2045 water supply deficit identified previously in Table 4-8. The maximum annual withdrawal conditions align with 2045 water supply deficits.

Table 6-2 Babcock Ranch Wellfield Proposed Primary Use WUP Allocation

Allocation Factor	Maximum Annual Withdrawal Conditions	Maximum Monthly Withdrawal Conditions
WUP Allocation	5,512 MG	1,404 MG[1]
Equivalent Daily Allocation	15.1 MGD	45.3 MGD[1]

[1] Value based on 3.0 MDF-to-AADF factor; assumes 31 days per month.

Developing a new water supply using the Babcock Ranch Wellfield would also require CCU to permit and construct a new RO WTP and a significant extent of infrastructure (i.e., transmission mains, water booster stations) to serve the Port Charlotte Water System or the Burnt Store Water System. As documented in the Johnson Engineering report, treatment of brackish water supplies from Babcock Ranch would require an RO process since total dissolved solids are 1,500 mg/L and chloride exceeds 600 mg/L based on historical well water quality data.

Additionally, discussions with PRMRWSA staff related to the transmission of Babcock Ranch water supplies to Mid County suggested CCU's 56-percent hydraulic capacity entitlement of the existing 24-inch-diameter Phase 1A pipeline (from Punta Gorda to Mid County, including a subaqueous crossing of the Peace River) may not be available nor offer sufficient capacity to transfer Babcock Ranch water supplies to Mid County. Therefore, CCU will need to construct a completely new pipeline from the proposed Babcock Ranch WTP to Mid County, including a portion of subaqueous pipeline to cross the Peace River.

At a preliminary level, the following new infrastructure features would need to be designed, permitted, and constructed to provide CCU with a new water supply from Babcock Ranch, subject to applicable state regulations:

- Babcock Ranch Wellfield (groundwater withdrawal wells and piping).
- Raw water booster station and transmission main from wellfield to new RO WTP.
- RO WTP with finished water storage and RO concentrate disposal well(s).
- Finished water transmission mains to Mid County and/or South County (includes new subaqueous Peace River crossing to Mid County).
- Water source blending/boosting station in Mid County.

Figure 6-2 shows the proposed infrastructure features required to develop Babcock Ranch water supplies.

Figure 6-2 Babcock Ranch Water Supply

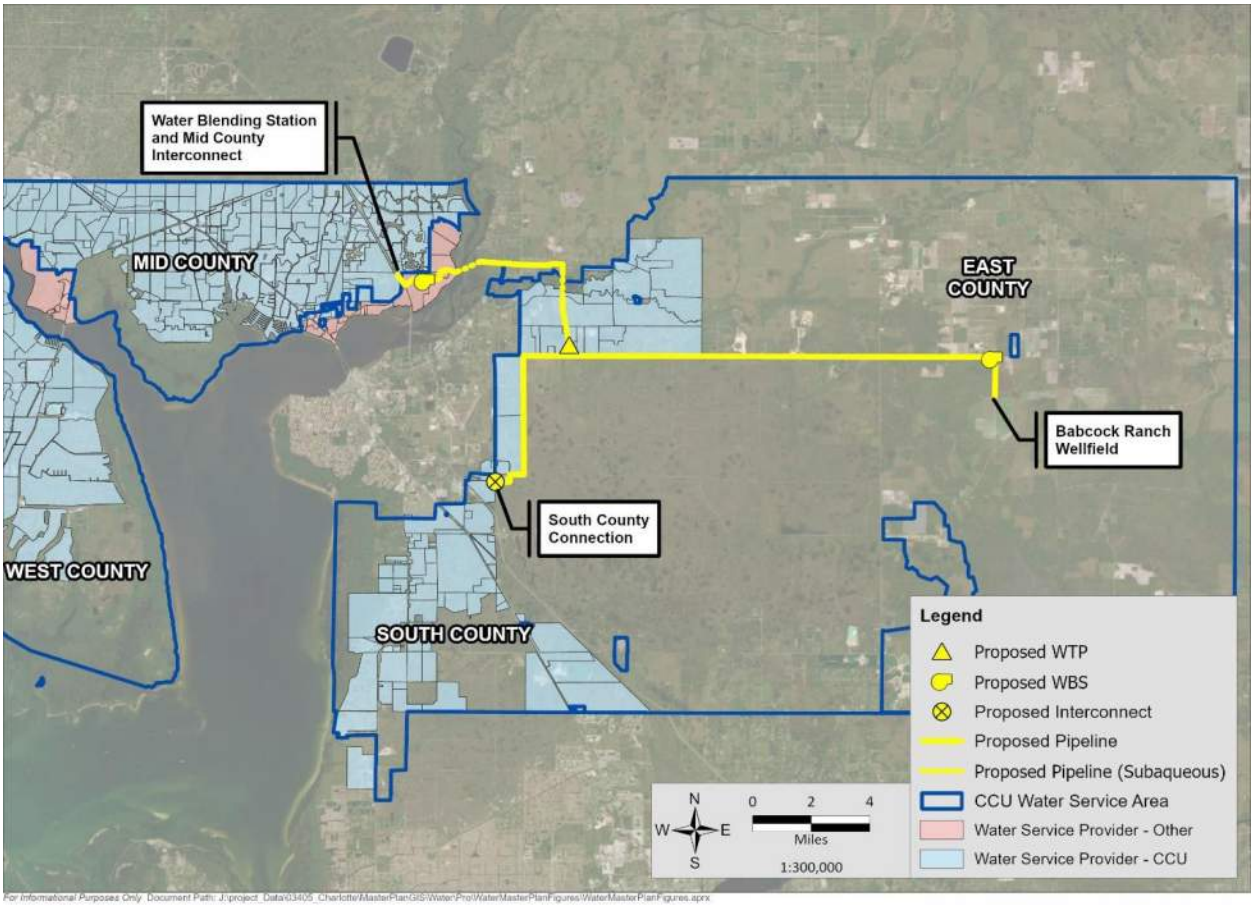


Table 6-3 summarizes the cost of the proposed infrastructure features required to supply finished water from Babcock Ranch, assuming an initial finished water capacity of 8 MGD AADF, with future plant expansions to 16 MGD AADF and 24 MGD AADF. Table 6-3 also lists the required year for project completion based on future water demand projections discussed in Chapter 4 under scenarios where CCU maintains existing LOS (145 gpd/ERC) or increases supply per capita to meet target LOS by 2045 (225 gpd/ERC). Table 6-4 provides a deeper breakdown of estimated capital costs for design and construction of Babcock Ranch water facilities with respect to 5-year CIP phasing.

Table 6-3 Babcock Ranch Water Supply Costs

RO WTP Capacity (MGD AADF)	Wellfield Yield (MGD)	Estimated Capital Costs ($1000)	Required Year for Completion at 145 gpd/ERC	Required Year for Completion at 225gpd/ERC
8	10	262,400	2037	2027
16	20	346,900	Beyond 2045	2037
24	30	418,900	Beyond 2045	Beyond 2045

Assumptions: Cost includes Babcock Ranch wellfield, 36-inch raw water main and raw water booster station, 36-inch Port Charlotte Water System connection pipeline (includes subaqueous portions) and water source blending station, and 16-inch Burnt Store Water System connection pipeline. Potential funding opportunities exist for both the Port Charlotte Water System and Burnt Store Water System connection pipelines; however, full cost is included herein. Wellfield and WTP sizing considerations included RO treatment losses.

Table 6-4 Babcock Ranch Water Facilities

Costs in $1,000s	8 MGD WTP		16 MGD WTP	24 MGD WTP	Total
	2026–2030	2031–2035	2036–2040	Beyond 2045	
Transmission Mains					
36-inch Raw Water Main (52,700 LF)	$23,700	$11,800	$ —	$ —	$35,500
36-inch Mid County Main (49,600 LF)	$23,800	$11,900	$ —	$ —	$35,700
16-inch South County Main (38,500 LF)	$ —	$ —	$12,400	$ —	$12,400
Transmission Mains Total	$47,500	$23,700	$12,400	$ —	$83,600
Wellfield and Future Expansions					
Wellfield & Pumps (10, 20, 30 MGD)	$14,200	$7,050	$10,625	$10,625	$42,500
Wellfield Piping & Electrical	$31,400	$15,600	$ —	$ —	$47,000
Wellfield Total	$45,600	$22,650	$10,625	$10,625	$89,500
Facilities and Future Expansions					
Raw Water Booster Station (10, 20, 30 MGD)	$15,000	$7,500	$11,250	$11,250	$45,000
New RO WTP (8, 16, 24 MGD)	$55,000	$27,400	$41,200	$41,200	$164,800
Mid County Water Blending Station (8, 16, 24 MGD)	$12,000	$6,000	$9,000	$9,000	$36,000
Facilities Total	$82,000	$41,900	$62,950	$62,950	$245,800
GRAND TOTALS	**$175,100**	**$87,250**	**$84,475**	**$72,075**	**$418,900**

Assumptions: Babcock Ranch 8-MGD finished water supply developed from 2026–2035. The 10, 20, and 30 MGD notations represent raw water withdrawal capacities at the 8, 16, and 24 MGD finished water expansions, respectively.

6.1.2 Regulatory and Legal Considerations

The primary benefit of the option from a regulatory standpoint is that the Babcock Ranch Wellfield is outside the SWFWMD Southern Water Use Caution Area (SWUCA), which improves the likelihood of obtaining a significant WUP quantity. As required in Section 373.2295, FS, a water transfer permit must be acquired to convey water from Babcock Ranch, which lies within SFWMD, to the Port Charlotte Water System, which is under SWFWMD jurisdiction. However, CCU may explore funding opportunities from both SFWMD and SWFWMD. The districts' review ensures that the project is consistent with public interest, population projections, comprehensive plans, future land use, and more. Additionally, CCU will need to obtain the proper FDEP permits for constructing a new WTP and conveyance infrastructure for serving PWSs.

From a legal standpoint, the *2005 Interlocal Planning Agreement* with Kitson & Partners (MSKP, 2006), the real estate company that sold the Babcock Ranch Preserve land in Charlotte County to the State of Florida, stipulates that Charlotte County may use a portion of the Babcock Ranch real estate to develop water supplies. Review of the Babcock Ranch state sale contract and other applicable legal agreements determined that Charlotte County may use Babcock Ranch to develop *primary* public water supply if, at a minimum, the following conditions are met:

1. Charlotte County cooperates with Babcock Ranch development to ensure that respective development of water resources from one does not adversely affect the other.
2. The need for demand beyond current capacity is demonstrated.
3. Use of Babcock Ranch lands for the withdrawal of water by Charlotte County is solely for public water supply purposes and not for wholesale or retail sale outside Charlotte County.
4. No well site shall be provided on property lying within Lee County.
5. Proposed pipelines and facilities shall be located along existing roads, easements, or previously impacted areas in such a way that preserves the land by creating the least environmental impact. Water transport shall not be located in wetlands or environmentally sensitive areas, including Telegraph Swamp.
6. Charlotte County shall pay considerations to the Board of Trustees upon request to grant proprietary use of lands for Charlotte County to develop public water supplies.

An application for modifications to the current WUP may be submitted at any time, but authorization is based on if *the proposed use is compatible with and consistent with the purpose for which the lands were acquired*. Approved by the Governor and Cabinet on November 22, 2005, this Agreement provides the following:

> *"At such a time as Charlotte County has demonstrated the need and demand for public water supply beyond its current capacity to the satisfaction of the regulatory agency with jurisdiction to allocate and permit the withdrawal of water and it has obtained a consumptive use permit for such a purpose, it may apply for the use of the property for the location of well sites, the installation of necessary pipelines and the installation of electrical utilities for such withdrawal. It is anticipated that the initial application will be for 10 MGD. Charlotte County may apply for a greater amount if there is a demonstrated need and demand for public water supply beyond 10 MGD…*

Charlotte County is authorized access to the property solely for the purpose of applying for the consumptive use permit and conducting studies associated with the same."

6.1.3 Advantages and Disadvantages

The advantages to Babcock Ranch supply are:

- Supports regional water supply objectives.
- Provides sufficient water supply to meet future needs.
- Involves straightforward permitting requirements.
- Has possibility for regional support co-funding.
- Requires few changes to current operation and maintenance.
- Allows supply to be used to supplement any part of Charlotte County.
- Increases the resilience and sustainability of PRMRWSA and CCU water supplies.
- Is outside the SWFWMD SWUCA.

The disadvantages are:

- Requires a new permit application that is Kitson & Partners reimbursement based.
- Requires additional reports, studies, and monitoring parameters.
- Requires significant extent of transmission main construction.
- Requires construction of a new RO WTP and potential acquisition of required land.
- Has substantial capital cost for building a new WTP and conveyance infrastructure.
- Has more limited co-funding opportunities than for regional PRMRWSA projects since SWFWMD prioritizes Authority projects. Potential for co-funding through SFWMD due to interdistrict transfer.
- Introduction of new non-surface-water supplies into Mid/West County would require a blending station for treatment of combined surface water and groundwater sources (Peace River and Babcock Ranch).

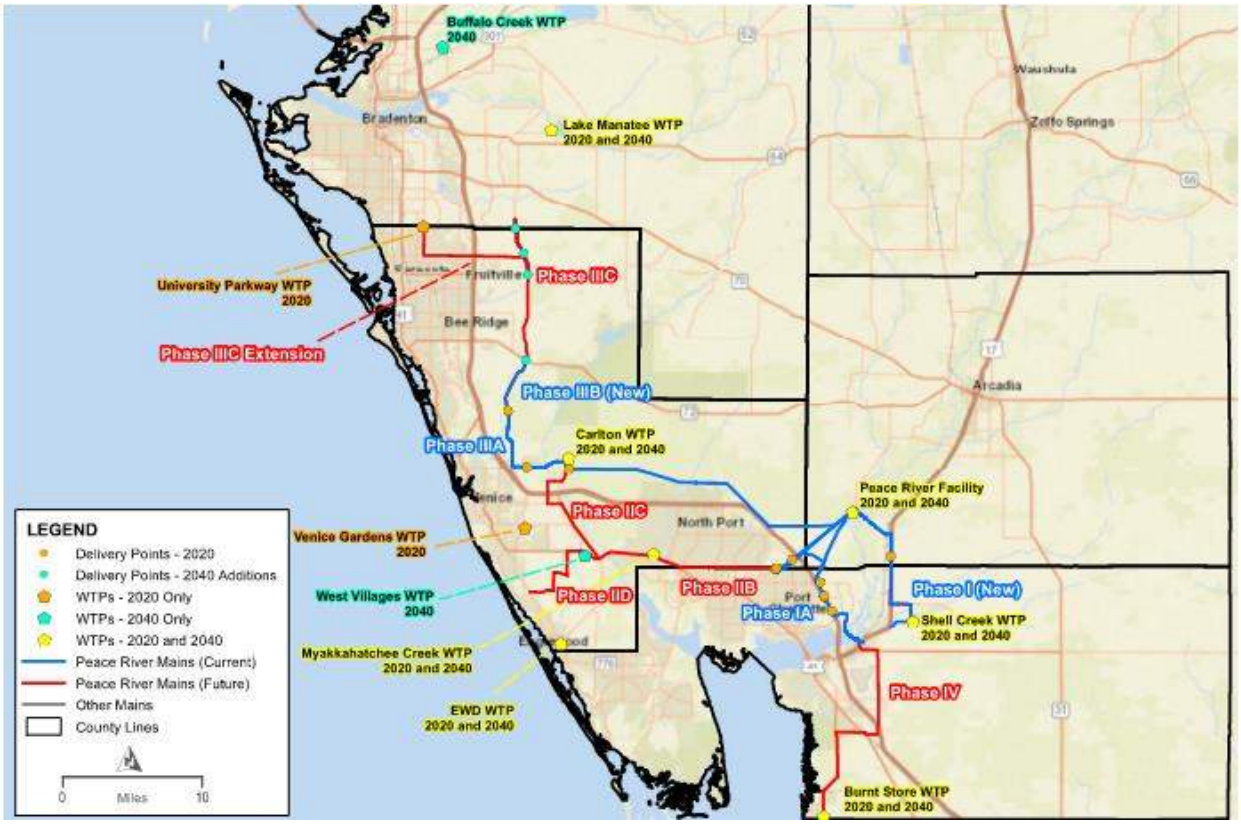
6.2 Increase PRMRWSA Allocation

6.2.1 Overview

The second regional water supply option for CCU is meeting future water demands by increasing the water supply allocation from PRMRWSA. Unlike other member governments, Charlotte County's Port Charlotte Water System is exclusively supplied by PRMRWSA. Although the PRMRWTF has a design treatment capacity of 51.0 MGD, the current total water supply allocated for member governments is 34.7 MGD based on a safe-yield AADF basis. Therefore, PRMRWSA must expand treatment capacity to make new allocation available. Previous studies have investigated the economics of various regional water supply options for the PRMRWTF; the predominant option identified for increasing capacity is the Reservoir No. 3 and PRMRWTF Expansion project. This project includes upgrading the existing surface reservoir pump station, constructing a new 9-BG surface reservoir, installing a new intake pump station and pipeline from Peace River, and implementing a 24-MGD treatment capacity expansion. Ultimately, this would allow PRMRWSA to increase the allocation available to government members by up to 18 MGD AADF (PBS&J, 2007; HDR, 2020).

PRMRWSA also has several ongoing projects planned as part of its continuing RTS expansion, which allows PRMRWSA to better supply its customers, increase operational flexibility, and improve regional resiliency. These projects also provide opportunity for improved economic feasibility through cost-sharing. Figure 6-3 (HDR, 2020) is a map of the current and future RTS pipelines including locations of delivery points and regionally connected facilities; the Phase IIB and Phase IV pipeline projects have been identified as improvements beneficial to both Charlotte County and PRMRWSA.

Figure 6-3 PRMRWSA RTS Expansion



Source: Integrated Regional Water Supply Plan 2020 Update (HDR), Figure 5.1.

During the development of water supply options under this CCPWMP, Jones Edmunds and CCU modeled various scenarios to determine the hydraulic impacts of increasing the PRMRWSA supply to the Port Charlotte Water System and ultimately the distribution system upgrades that may be required. Chapter 7 discusses the modeling process, parameters, scenarios, and results in detail. Simultaneous with this effort, PRMRWSA was conducting a feasibility study (Kimley-Horn, 2021) for the Phase IIB pipeline in Mid/West County to determine the most viable pipeline route for extending the RTS to the Englewood WBS. CCU, PRMRWSA, Jones Edmunds, and Kimley-Horn worked collaboratively to determine the best route for all parties through a series of efforts, meetings, and discussions.

At the time of this report, the Phase IIB pipeline progressive design-build project has concluded Phase 1 services (60% design) and is now in Phase 2 services (final design, construction, permitting, property acquisition, testing, and final completion). The RTS pipeline is proposed as a 42-diameter east-to-west transmission main from the existing CCU Harborview interconnect to the Gulf Cove WBS; the routing will be along Hillsborough Boulevard/Chancellor Boulevard before turning south along Campbell Street and spanning

the Myakka River before terminating at the Gulf Cove WBS. The project is scheduled for final completion by March 2026.

The Phase IV pipeline has been updated in this report to better reflect the potential pipeline routing and interconnect location required to serve the Burnt Store Water System with respect to existing infrastructure and future CCU pipeline CIPs. According to PRMRWSA capital needs assessment, the Phase IV pipeline project will begin feasibility/planning study in late 2033. Figure 6-4 generally represents revised routes for the Phase IIB and Phase IV RTS pipelines. The Phase IIB pipeline design plans to incorporate several interconnects, which PRMRWSA has coordinated with CCU through additional modeling efforts, meetings, and discussions. Table 6-5 summarizes the current status of the two projects.

Figure 6-4 PRMRWSA RTS Revised Phase IIB and Phase IV Pipelines

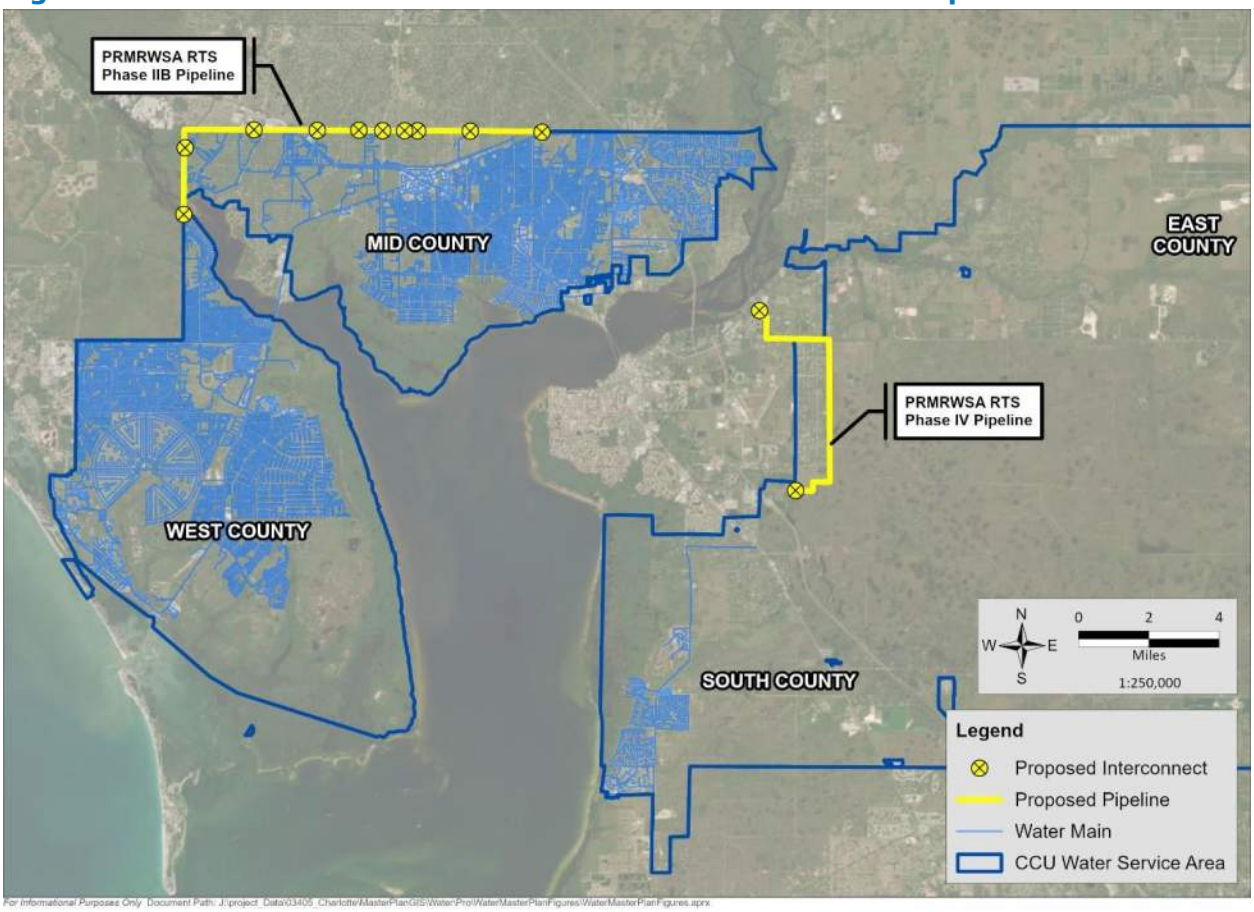


Table 6-5 Revised RTS Pipelines in Charlotte County

RTS Pipeline Project	Diameter of Pipe	Approximate Length of Pipe	Project Status Update
Phase IIB	42-inch	13 miles	Nov. 2022 – Notice to Proceed for Phase 2 services issued. March 2026 – Project final completion.
Phase IV[1]	16-inch[1]	8 miles[1]	Late 2033 – Begin feasibility/planning study.

[1] Revised pipeline requirements shown based on existing and future CCU infrastructure, subject to PRMRWSA RTS requirements. Previously determined to be 15 miles of 24-inch-diameter pipe. Actual diameter and length of pipe are to be determined as part of PRMRWSA feasibility/planning study.

6.2.2 Regulations and Legal Considerations

CCU must consider the feasibility of increasing the PRMRWSA allocation from a regulatory and legal standpoint. In accordance with the MWSC, PRMRWSA reserves the rights to retain unallocated water capacity. However, once acquired through payment for new facilities, customer water supply allocations and hydraulic capacity entitlements are intangible assets of the customer. Hydraulic capacity entitlement refers to RTS benefits proportionate to delivery points and allocation of water supply. If transmission mains are shared, hydraulic capacity entitlement is proportionately divided among the benefited parties. Entitlement to future pipelines will be determined on a segment basis by PRMRWSA. Table 6-6 and Table 6-7 show the current PRMRWSA customer water-supply allocations according to the current MWSC and near-term hydraulic capacity entitlements with respect to the Phase IIB pipeline, respectively.

Table 6-6 Current MWSC Customer Water Allocation

PRMRWSA Customer	Water Supply Allocation (MGD AADF)	Water Allocation (Percentage)
Charlotte County	16.100	46.40
DeSoto County	0.675	1.94
Sarasota County	15.060	43.40
City of North Port	2.865	8.26
Manatee County	0.000	0.00
Total	**34.700**	**100.00**

Table 6-7 Near-Term MWSC Hydraulic Capacity Entitlement

PRMRWSA Customer	36-inch/ 12-inch RTS[1]	24-inch Kings Highway RTS[2]	24-inch Phase 1A	42-inch Phase IIB RTS[3]
Charlotte County	89.65%	80.00%	56%	50.00%
DeSoto County	0.42%	20.00%	0.00%	0.00%
Sarasota County	0.00%	0.00%	0.00%	0.00%
City of North Port	9.93%	0.00%	0.00%	0.00%
Manatee County	0.00%	0.00%	0.00%	0.00%
PRMRWSA Unallocated	0.00%	0.00%	44%	50.00%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

[1] Includes two Charlotte County interconnects (Harbor Boulevard, Kings Highway), two DeSoto County interconnects, and one North Port interconnect.
[2] Includes one Charlotte County (Kings Highway) interconnect and three DeSoto interconnects.
[3] Pipeline not constructed; final completion expected by March 2026.

PRMRWSA customers will encounter fixed costs and non-fixed costs. Fixed costs are typically paid based on percentage allocation of the total allocated AADF, or 34.7 MGD. These costs generally include O&M costs, renewal and replacement reserve, administrative costs, contingency, and system-wide CIP funding that are rolled into a contribution pool. Non-fixed costs are established specific to each customer and include debt service, outstanding resolution payments, and CIP funding for water supply projects. Together, these fixed and non-fixed costs form each customer's annual base-rate charge, adjusted

accordingly before each fiscal year. In addition to the annual base-rate charge, customers also pay a member fee based on population (primarily to fund administrative services) and must purchase water at a fixed gallonage rate. For reference, Table 6-8 shows estimated recurring annual costs paid by CCU for PRMRWSA water supply; the costs provided are general estimates for reference and do not include debt service, outstanding resolution payments, and CIP funding for water supply projects.

Table 6-8 Estimated Recurring Annual Cost to CCU for PRMRWSA Water Supply

Fiscal Year	Base Rate Charge[1]	Water Use Charge (per 1,000 gallons)[1]	Estimated Total Water Use Charge[2]	Estimated Recurring Annual Cost (rounded)[3]
2014	$ 9,132,306	$ 0.74	$ 2,800,000	$12,000,000
2015	$ 8,864,846	$ 0.74	$ 2,800,000	$11,700,000
2016	$ 8,810,112	$ 0.74	$ 2,900,000	$11,800,000
2017	$ 8,969,668	$ 0.74	$ 3,000,000	$12,000,000
2018	$ 9,193,215	$ 0.74	$ 2,800,000	$12,000,000
2019	$ 9,365,713	$ 0.74	$ 2,900,000	$12,300,000
2020	$ 9,659,088	$ 0.76	$ 3,000,000	$12,700,000
2021	$ 10,008,852	$ 0.79	$ 3,400,000	$13,500,000
2022	$ 9,739,617	$ 0.82	$ 3,400,000	$13,200,000
2023	$ 10,256,641	$ 0.89	$ 3,700,000	$14,000,000

[1] Source: PRMRWSA Approved/Amended FY Budgets (2014 through 2023). Charge includes O&M costs, renewal and replacement reserve, administrative costs, contingency, and system-wide CIP funding.
[2] General estimation for reference purposes only; calculated using Water Use Charge times CCU historical calendar year water consumption (PRMRWSA) as reported in PSARs. Year 2023 value calculated using 2022 water consumption.
[3] Represents Base Rate Charge plus Estimated Total Water Use Charge.

In accordance with MWSC contract requirements, PRMRWSA implements water supply projects based on the timing of future water allocation requests submitted by each government member; i.e., projects to increase total water supply allocation typically are not executed until such future water demand requests deem it necessary. Table 6-9 provides a year-by-year breakdown of potential future water allocation requests, as submitted by each PRMRWSA member, for PRMRWSA's current 20-year future water supply planning period from 2023 through 2042.

If each member government is to fulfill the noted water allocation requests using new water supply from PRMRWSA, then the PRMRWTF capacity would need to be increased by approximately 10 MGD by 2034 and approximately 24 MGD by 2042 and/or new facilities would need to be built. Therefore, the existing PRMRWSA allocation total of 34.7 MGD would need to be expanded to 44.7 MGD AADF by 2034 and to 58.7 MGD AADF by 2042.

Concurrently, PRMRWSA has continued developing several CIPs that benefit member governments – some which would increase the water supply allocation available to members. Table 6-10 summarizes the most recently published PRMRWSA CIPs and capital needs assessment for 2023–2042. The table indicates which projects have partial funding

from other agencies and the remaining costs to be funded by the member governments based on the percent of water supply allocation.

Table 6-9 Potential Future Water Allocation Requests

Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Manatee County	Total
Total Existing Allocation (MGD)						
Present	16.10	0.675	15.06	2.865	0.00	34.70
Future Requested Allocation by Year (Cumulative, MGD)						
2023	0.00	0.05	0.00	0.00	0.00	0.05
2024	0.00	0.12	0.00	0.00	0.00	0.12
2025	0.00	0.18	0.00	0.00	0.00	0.18
2026	0.00	0.23	0.00	0.00	0.00	0.23
2027	0.00	0.28	0.00	0.00	0.00	0.28
2028	0.76	0.30	0.00	0.00	0.00	1.06
2029	1.53	0.31	1.20	0.00	0.00	3.04
2030	1.92	0.30	4.20	0.00	0.00	6.42
2031	3.07	0.33	4.20	0.00	0.00	7.60
2032	3.83	0.34	4.20	0.00	0.00	8.37
2033	4.60	0.04	4.20	0.00	0.00	8.84
2034	5.37	0.36	4.20	0.00	0.00	9.93
2035	6.25	0.37	6.70	0.00	0.00	13.32
2036	6.89	0.38	6.70	0.00	0.00	13.97
2037	7.65	0.39	6.70	0.00	0.00	14.74
2038	8.42	0.40	6.70	0.00	5.00	20.52
2039	9.17	0.41	6.70	0.00	5.00	21.28
2040	9.91	0.42	6.70	0.00	5.00	22.03
2041	10.67	0.43	6.70	0.00	5.00	22.80
2042	11.45	0.44	6.70	0.00	5.00	23.59
Total Future Allocation (MGD)						
2042	27.55	1.115	21.76	2.865	5.00	58.29

Table 6-10 PRMRWSA CIPs

Project Description	Yield (MGD)	Total Project Cost ($1,000)	Anticipated Funding ($1,000)	Member Government Costs ($1,000)
1. RTS Phase IIB Pipeline	0	75,000[1]	3,750	3,750
2. Reservoir No. 3 and PRMRWTF Expansion[2]	18[2]	650,000[1,2]	112,000[1,2]	538,000[1,2]
3. Kings Highway Replacement	0	3,289	—	3,289
4. Water Resources Building	0	2,373	—	2,373
5. Partially Treated ASR System	0	32,300	16,150	16,150
6. 12-inch PVC Line Replacement	0	2,752	—	2,752
7. 5-MGD Brackish Water RO WTP	5	55,863	28,181	27,681
8. ASR Wellfield Expansion	0	27,915	14,007	13,907

Source: 5-Year CIP and Capital Needs Assessment for 2023-2042 (PRMRWSA, June 2022)

[1] Updated cost as of Peace River Board Meeting held on December 7, 2022. Cost confirmed with PRMRWSA before the February 21, 2023 BCC meeting.

[2] Reservoir No. 3 and PRMRWTF Expansion consolidated into one project. PRMRWSA also developed a lesser-yield alternative, which would supply 14 MGD at the total project cost of $550M and remaining cost of $438M; funded costs remain $112M.

As shown, only two planned projects (No. 2 and No. 7) will increase PRMRWSA's water supply available for allocation (safe yield). Therefore, the total member government cost to develop approximately 18 MGD as new allocation is estimated to be approximately $565.7M, or a unit cost of $24.6M per MGD. The high cost is reflective of the cost for the Reservoir No. 3 and PRMRWTF Expansion project. Table 6-11 summarizes cost, funding, and yield for the Reservoir No. 3 and PRMRWTF Expansion projects at different stages of project development.

Table 6-11 Development of the Reservoir No. 3 and PRMRWTF Expansion Project

Month Year	Estimated Cost	Anticipated Funding	Member Government Cost[1]	Safe Yield (MGD)	Reference
June 2021	$282.9M	$133.4M	$149.5M	15	CIP-CAN 2022–2041
June 2022	$447.3M	$210.7M	$236.6M	15–18	CIP-CAN 2023–2042
Dec. 2022	$660M	$112M	$548M	18	PRMRWSA – Board of Directors Meeting (Dec. 7, 2022)
Jan. 2023	$550M	$112M	$438M	14.5	'Value Engineering Option' PRMRWSA and Charlotte County – Board of Directors Meeting (Jan. 9, 2023)

[1] Represents approximate total cost to members seeking to reserve safe yield as new water supply allocation under the MWSC.

As shown, estimated costs for the Reservoir No. 3 and PRMRWTF Expansion project have realized substantial increases for member governments throughout project development.

Since SWFWMD capped its funding contributions for this project at $112M, increases to overall project cost will become the responsibility of PRMRWSA members seeking to reserve additional water supply allocation(s).

Ultimately, the development of PRMRWSA water supply projects hinges on member government participation. Each member individually evaluates its participation based on their future needs and economic feasibility. Specifically for larger projects associated with high cost, dramatic decreases in anticipated shared-funding opportunities warrant greater government member considerations. CCU should continue to coordinate with PRMRWSA to better determine the availability of future water supply allocation and reserve additional allocation with respect to water supply demand projections and development of the Babcock Ranch water supply.

6.2.3 Advantages and Disadvantages

The primary advantages to increasing the allocation from PRMRWSA and adding interconnects are:

- Makes no significant changes to water quality in Mid and West County.
- Reduces dependence on the Walenda WBS.
- Increases redundancy and resiliency in the systems.
- Requires no additional treatment from CCU.
- Requires minor permit modifications.
- Provides regional co-funding opportunities.
- Allows for future supplementation of PRMRWSA water supplies by the Burnt Store WTP.
- Allows CCU through a Burnt Store Water System interconnect to contribute to the regional supply using the Burnt Store WTP.
- Requires only minor upgrades for WBSs.

The primary disadvantages are:

- Has substantial government member capital cost for increasing allocation.
- May require CCU to share their existing easements for future transmission mains.
- Requires construction of new transmission mains to serve South County.
- Makes significant changes to water quality in South County.
- Requires disinfection conversion for South County.
- Future water supply to CCU is not guaranteed since it may be allocated to other PRMRWSA members.

6.3 Install New Groundwater Wells

6.3.1 Overview

This option evaluates the potential to install new groundwater wells to meet the future water demands of the Port Charlotte and Burnt Store Water Systems. The most feasible well locations for groundwater supply expansion in the currently served areas have been identified in previous reports and described herein based on the best available information provided by CCU.

According to the *Countywide Reverse Osmosis Feasibility Study* (Malcom Pirnie, 2008b), the most feasible water withdrawal site for the Port Charlotte Water System is in West County at 11935 Waterman Avenue, Port Charlotte, Florida 33981. Over 200 potential parcels were evaluated as potential water supply withdrawal sites based on criteria inclusive of natural resource conservation, infrastructure and population, groundwater quality and yield, withdrawal depth, environmental factors, and more. The hydrogeologic conditions at 11935 Waterman Avenue suggest that up to 5 MGD are likely available for withdrawal and the parcel is currently owned by the County.

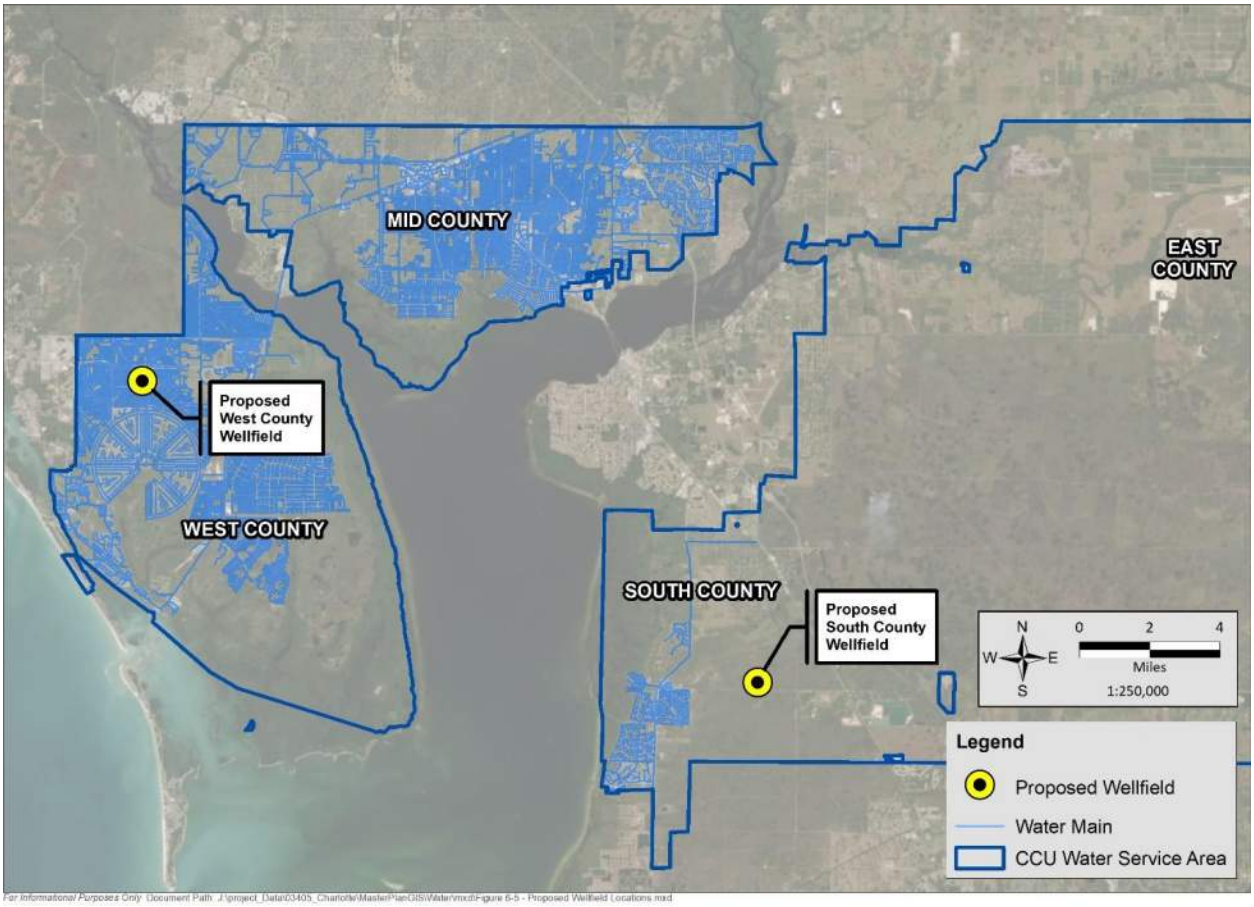
Available information indicates saltwater intrusion is becoming a more common issue for groundwater wells near the coast. Groundwater withdrawn from this area is expected to have a saline or brackish quality. This may not occur immediately, but due to the high probability of occurrence a nano-filtration (NF) or RO membrane process would likely be required to treat the new groundwater supply. Membrane treatment is energy intensive and requires a concentrate disposal method; however, it also produces high-quality drinking water and is among the leading technologies for addressing emerging contaminants such as nano-particles and per- and polyfluoroalkyl substances (PFAS).

In addition, the type of treatment is a key consideration for the sustainability of future water supplies since NF and RO treatment processes will yield approximately 15- to 25-percent raw water losses. Assuming 20-percent water loss, this option could produce approximately 4 MGD with the development of a wellfield at 11935 Waterman Avenue. This wellfield location would boost supplies in West County (where projected demands are substantial), and the WTP would likely be installed at the Rotonda WBS based on land ownership and current infrastructure. CCU has historically operated or owned three WTPs in West County including the Rotonda lime softening WTP, Fivelands RO WTP, and Rotonda West RO WTP. These facilities were converted or abandoned as the cost for replacing and maintaining the WTPs was no longer economical compared to the alternative of purchasing water from PRMRWSA. The wells associated with the Rotonda WTP were removed, but the Fivelands and Rotonda West utility wells remain cut and capped based on database review of well completion permits, WUPs, and local public water supply wells. These wells do not currently have permitted withdrawal amounts, and therefore, even if the infrastructure could be reused they would still require re-permitting to be used.

The Burnt Store Water System is currently treating a brackish water supply at the Burnt Store RO WTP. As mentioned in Section 4.5, the Burnt Store WTP is permitted to install four new wells to expand its current capacity and fully use its permitted WUP capacity. The new wells should be sited away from the existing wells and farther east to yield groundwater with less salinity. Typically, the closer to the coast, the greater the potential for higher salinity groundwater. Regardless of the additional four wells, CCU will still require expansion of the wellfield and WUP to meet future demands. The additional wellfield should be sited in a remote area where development is currently not planned. The wells will require additional raw water transmission mains to convey flows to the Burnt Store WTP for treatment.

Figure 6-5 displays the proposed wellfields for the Port Charlotte Water System and Burnt Store Water System.

Figure 6-5 Proposed Wellfield Locations



6.3.2 Regulatory and Legal Considerations

Groundwater is the most common raw water source option in Florida. As a result of abundant withdrawal centers, groundwater sources in coastal areas are experiencing water-quality degradation from oceanic saline intrusion. In 1992, FDEP designated a large region of southwest Florida as the SWUCA in an attempt to slow aquifer and lake levels from declining and combat advancing coastal saltwater intrusion by limiting groundwater withdrawals. The SWUCA encompasses the majority of Charlotte County and only excludes the east portion of the County that is under the jurisdiction of SFWMD. As such, permitting new wellfields in Mid and West County may be more challenging since it conflicts with the SWUCA goals to conserve water and reduce withdrawals. The regulatory implications of expanding the Burnt Store WTP wellfield are less restricted since the existing wellfield is permitted for additional wells. However, installing future wells beyond those already listed in CCU's existing WUP may be difficult since the Burnt Store Wellfield is within the SWUCA.

One potential option to assist in the SWFWMD WUP permitting process may be to install stormwater or reclaimed water aquifer recharge wells to offset the new groundwater withdrawals. The recharge water would be required to meet water quality standards and be permitted through the FDEP UIC group. If recharge wells were installed, CCU could justify the environmental benefit of the operation and negotiate net benefit credits with SWFWMD.

6.3.3 Advantages and Disadvantages

The advantages and disadvantages to drilling new wells in Mid/West County and South County are similar in that they are both expected to ensure the sustainability of the water supply assuming the respective WUP are acquired or modified. CCU operators are familiar with the treatment technologies, resulting in ease of operation.

The primary advantages to constructing new groundwater wells or a new wellfield are:

- Provides sufficient water supply to meet future needs in South County.
- Uses RO treatment, which CCU staff have experience operating.
- Requires less finished water conveyance infrastructure in Mid, West, and South Counties.
- Involves straightforward process for installing the currently permitted wells in South County.
- Has possibility for regional support co-funding if becoming a water provider for the region.

The primary disadvantages are:

- Provides only partial water supply in Mid/West County to meet future needs.
- Requires adding additional raw water conveyance infrastructure.
- Requires an additional WTP in Mid/West County.
- Likely requires desalination treatment due to saline or brackish quality.
- Has significant capital and O&M costs.
- Is contrary to SWFWMD goals by adding new WUPs within the SWUCA.

6.4 Potable Reuse

6.4.1 Overview

This option evaluates the feasibility of using potable reuse to meet future water demands. According to *Framework for the Implementation of Potable Reuse in Florida* (prepared for the Florida Potable Reuse Commission [FPRC], 2019), potable reuse is defined as the augmentation of a drinking water supply with advanced treated water. Potable reuse may be classified in two categories – indirect (IPR) or direct (DPR). IPR applications provide an environmental buffer (e.g., a river, wetland, aquifer) before the water treatment process or distribution system, whereas DPR refers to the introduction of advanced treated water directly into the WTP or water distribution system. The use of an environmental buffer has several purposes, including providing system storage, conveyance of water resources, and/or an additional barrier between the advanced treated water and the public. Arguably, IPR has been in practice for decades, but DPR has seldomly been used in the United States since its first successful application in 1978 by the Upper Occoquan Service Authority in Fairfax County, Virginia. Potable reuse has historically faced avid public resistance and posed unfamiliar technical challenges. However, large water providers in arid regions have implemented the process for years as a matter of necessity, and it has been used in small-scale closed environments such as the space station for decades. As water-supply source quantities continue to diminish and advanced water treatment technologies become more

economically feasible, more utilities will begin to implement potable reuse to supplement potable water supply.

The quantity of drinking water available through DPR augmentation is primarily driven by reclaimed water supplies produced at the WRFs. CCU's WRFs produce reclaimed water, which means the water has received at least secondary treatment and basic disinfection. If CCU proceeds with potable reuse, the reclaimed water would be further treated at an advanced water treatment facility (AWTF) using a multi-barrier treatment process to produce water that meets primary and secondary drinking water standards. The specific combination of treatment processes employed will depend on the quality of the source water, the type of potable reuse (i.e., IPR or DPR), and the existing treatment in place. The AWTF could be installed at the WTP or the WRFs. Based on the space availability and water storage requirements, the AWTF would assumably be at the WRF site. Figure 6-6 displays the locations of CCU's four WRFs.

Figure 6-6 CCU Existing WRF Locations

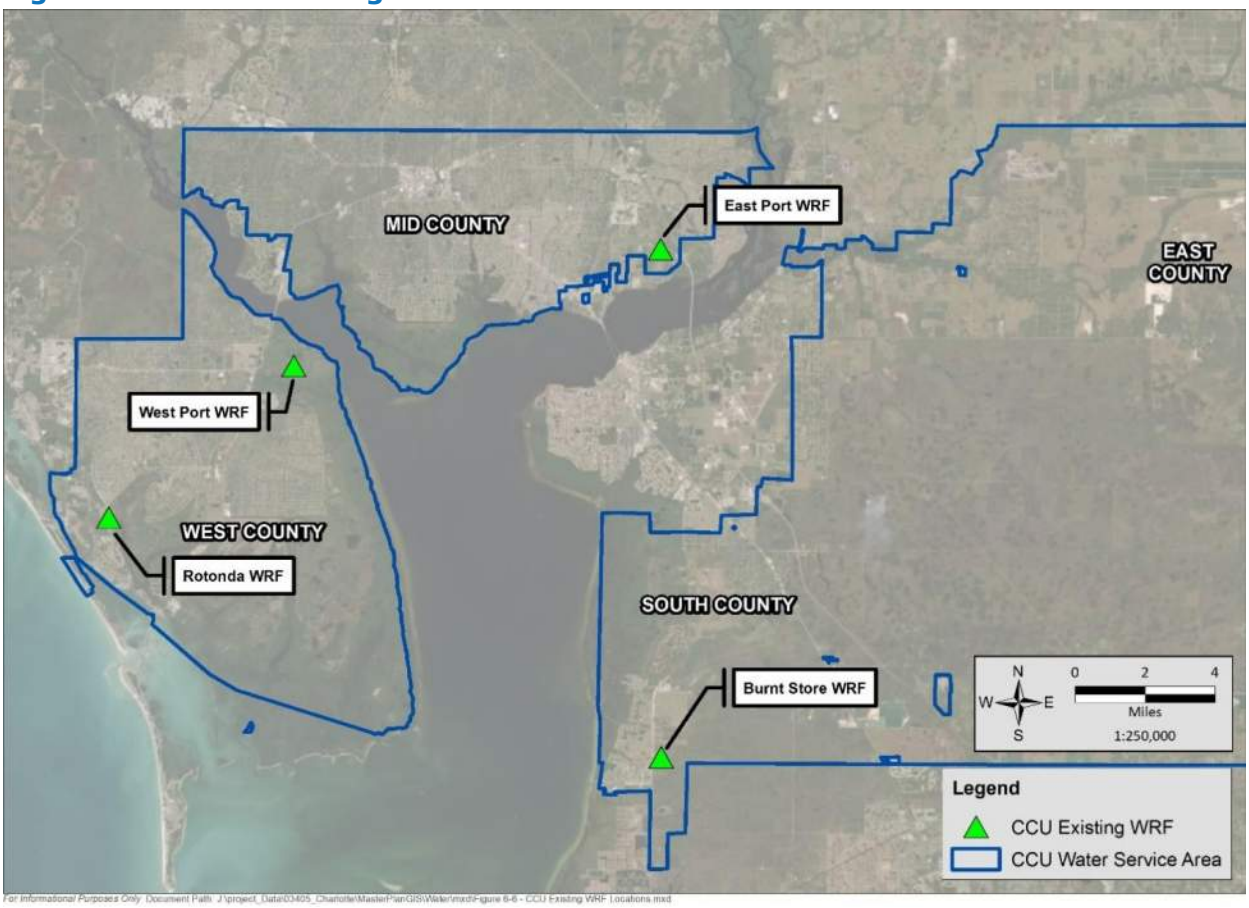


Table 6-12 shows the reclaimed water projections for 2040 that were included as part of the *Reclaimed Water Master Plan* (Jones Edmunds, 2022). Water supply, demand, and resulting surplus or deficit are included for the regional areas based on current and potential future users. Mid County and South County are expected to have a surplus of reclaimed water supplies, whereas West County will have a deficit. As discussed in the *Reclaimed Water Master Plan*, the deficit could be addressed by supplying excess reclaimed water flows from the East Port WRF via the Master Reuse System, but major conveyance improvements

would be required. Alternatively, the excess reclaimed water could be used for DPR or IPR applications.

Table 6-12 Reclaimed Water Supply and Demand Analysis under 2040 Conditions

Service Area	2040 Reclaimed Water Supply AADFs (MGD)	2040 Customer Demands AADDs (MGD)	Surplus/(Deficit) (MGD)
Mid County	10.4	5.03	5.37
West County	4.1	7.33	(3.23)
South County	5.0	3.56	1.44
Total	**19.5**	**15.9**	**3.58**

From a supply standpoint, an AWTF could be implemented in Mid County's East Port WRF or South County's Burnt Store WRF for DPR. The WRFs have sufficient space to expand treatment processes for treating reclaimed water to drinking water standards. Some additional transmission upgrades would be required to convey the treated water to the nearest WBS or WTP. The Burnt Store WRF may also have the potential to implement IPR using nearby Well 15, which is currently out of service due to degrading water quality.

The capital and O&M costs associated with DPR and IPR are expected to be significant but are partially offset by CCU's ability to sell the treated water at potable rather than reclaimed water rates. Table 6-13 displays the difference in reclaimed and potable water rates and the range of revenue that would be generated from selling the excess flow in South County (i.e., 1.44 MGD).

Table 6-13 Reclaimed and Potable Water Revenue Comparison

Rate Type	Rate Range ($/1,000 gallons)	Total Monthly Revenue	Total Yearly Revenue
Reclaimed (Pond or Direct Feed)	0.13 to 0.36	$5,700 to $15,800	$68,300 to $189,200
Potable (Standard)	5.85 to 11.11	$256, 200 to $486,600	$3,074,800 to $5,839,400

The historical reclaimed water vision for CCU has been to economically maximize the sale of reclaimed water while complying with all environmental regulations regarding the reuse and/or disposal of all remaining reclaimed water. However, as regulations change and treatment capabilities improve, using reclaimed water for DPR rather than irrigation becomes increasingly economical.

6.4.2 Regulatory and Legal Considerations

No current federal regulations govern potable water reuse. EPA has published two documents addressing water reuse in potable water sources. Chapter 2.6 of *2004 Guidelines for Water Reuse* (EPA, 2004) discusses the augmentation of potable water supplies with reuse also known as potable reuse. The *2017 Potable Reuse Compendium* (EPA, 2021) was published in response to growing interest in DPR across the country and outlines key

science, technical, and policy considerations. These publications support the development of state regulations.

Due to increasing water demands and limited water supply, Florida recently established *One Water Florida*, a state-wide initiative to promote the reuse of reclaimed water by educating the public on the many benefits that reclaimed water can safely provide. The program highlights the benefits of recycled water including the use of potable reuse for drinking, cooking, and bathing. This program features partners from regulatory agencies and professional organizations such as FDEP, Florida's water management districts, Florida Section of the AWWA, FPRC, Florida Water Environmental Association, and WateReuse Association who offer funding and support for utilities conducting potable reuse feasibility studies and projects.

Chapter 62-610, FAC, *Waste Treatment and Disinfection*, recently published a revised Chapter with respect to guidance provided in *Framework for the Implementation of Potable Reuse in Florida* (FPRC, 2019). In this, the authors suggest that drinking water regulations should be rewritten to include reuse and that all potable water produced must meet primary and secondary drinking water standards. Treatment must be completed at an AWTF, which requires a multi-barrier approach in the selection of treatment processes. The technologies expected to accomplish advanced water treatment for potable reuse include a combination of processes such as soil aquifer treatment (SAT), ozonation/biologically active filtration (BAT), bank filtration, low-pressure membrane filtration, reverse osmosis, and ultraviolet-advanced oxidation process (UV-AOP).

Rule 62-555.318, FAC, also stipulates a 12-month pilot testing program before full implementation of potable reuse projects. This regulation requires acceptable demonstration of the system's ability to consistently meet required treatment and disinfection criteria. The pilot test should identify critical points for improved process control and provide 12 months of data to be used in the final treatment process design. During this phase, water quality should be monitored and reported to demonstrate reliability and consistency in the facility's ability to achieve desired levels of treatment and disinfection. Currently, no permitted full-scale potable reuse facilities exist in Florida, but some utilities have on-going feasibility and pilot studies. Permitting for pilot systems must be obtained from FDEP's Domestic Wastewater and Source and Drinking Water Programs, and the utility must have an Industrial Pretreatment Program in place before pilot testing can commence.

6.4.3 Advantages and Disadvantages

The primary advantages to potable reuse supplementation are:

- Takes advantage of additional reclaimed water supplies available in Mid County and South County based on discussion provided in the *Reclaimed Water Master Plan* (Jones Edmunds, 2022).
- Increases revenue stream compared to selling reclaimed water.
- Has co-funding opportunities with regulatory agencies.
- Takes advantage of available space in the East Port and Burnt Store WRFs for AWTF.
- Supports the County's reclaimed water goals and increases the sustainability of the system.
- Involves simple conveyance from the Burnt Store WRF.

- Helps to comply with new FDEP regulation of eliminating non-beneficial WRF effluent discharges to surface water bodies.
- Provides redundancy and reduces dependency on existing WRF effluent reuse and disposal applications.

The primary disadvantages are:

- Lacks additional reclaimed water supply in West County.
- Because of potable reuse offsets, reduces reclaimed water available for irrigation, leading to environmental impacts.
- May require new storage facilities for controlling reclaimed water flow variations.
- Requires AWTF and multi-barrier treatment approach which increases treatment costs.
- Requires transmission piping to convey treated flows from the AWTF to existing potable WBSs.
- Involves additional training for specialized operations staff.
- Requires pilot testing before implementation.
- Involves unknown permitting and regulatory framework.
- Significant capital cost required to upgrade facilities to treat potable reuse.

6.5 USE NEIGHBORING INTERCONNECTS

6.5.1 OVERVIEW

This option explores the feasibility of using existing or installing future interconnects with neighboring utilities to supplement CCU's future water demands. As mentioned previously, the Port Charlotte Water System contains several emergency interconnects with the Cities of North Port and Punta Gorda, CHWA, and EWD. The Burnt Store Water System currently does not have interconnects with neighboring utilities but could install a pipeline to connect to Punta Gorda or Cape Coral. Figure 6-7 displays the approximate locations of the potential supply interconnects.

This option assumes that the existing emergency interconnects would be reclassified as supply interconnects and that new interconnects with the Cities of Punta Gorda and Cape Coral would be installed in South County. The option considers each water service provider's current and available supply, source water and treatment compatibility, plant capacity, disinfectant compatibility, pipe conveyance capacity, need for additional infrastructure, and rate impacts to determine which water service providers would be capable of supplementing CCU's future AADDs. Table 6-14 through Table 6-21 present the results gathered from various sources from 2019 through 2020 including WUPs, FDEP MORs, Sanitary Surveys, and water-service provider websites and various reports.

Figure 6-7 Potential Supply Interconnects

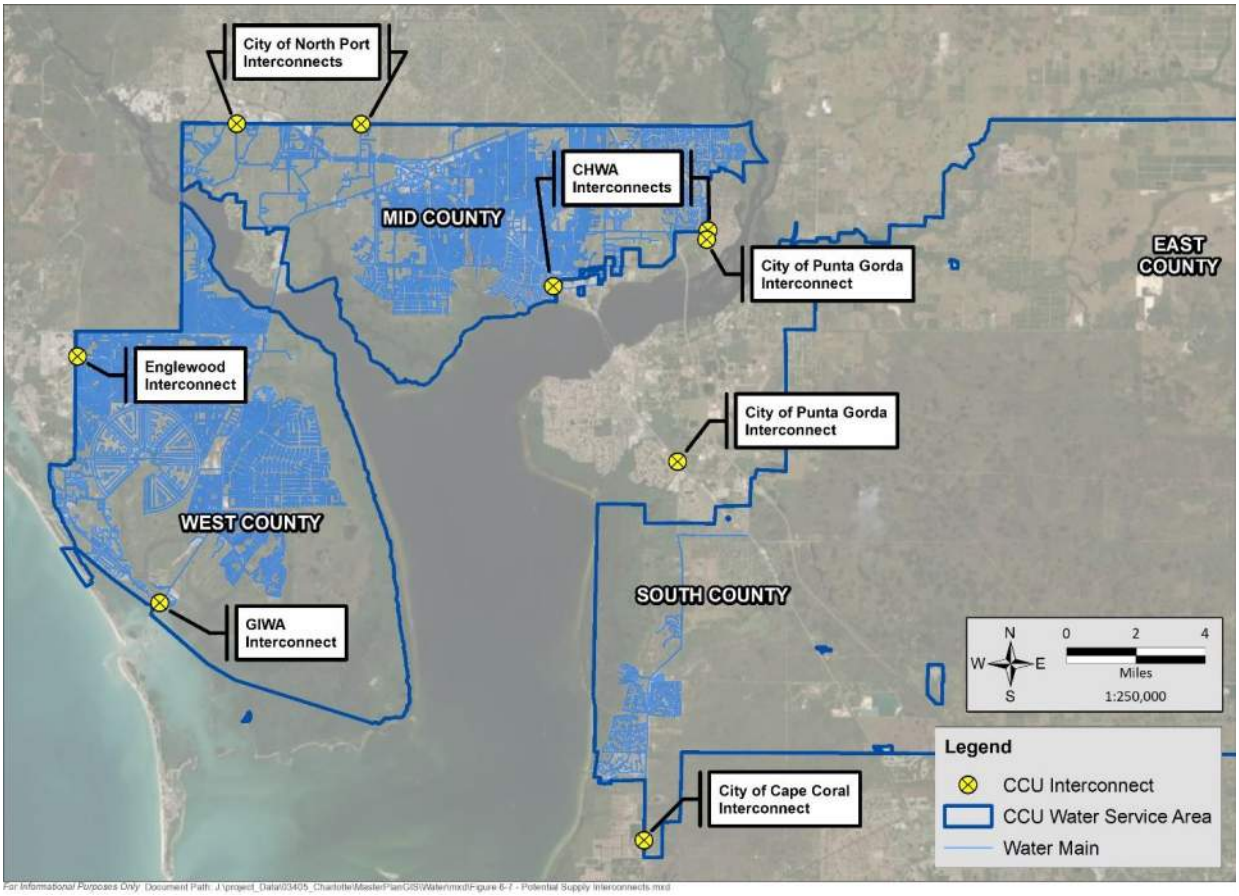


Table 6-14 displays the WUP capacities for AADF and PMF conditions for each neighboring water service provider, and Table 6-15 displays the potential available water supply based on current AADDs. The results indicate that a maximum of 8.8 MGD and 7.81 MGD of water could be available to supply the Mid/West County and South County service areas, respectively. However, the estimate is based on WUPs and current flows and does not include the projected future flow needs of the other water service providers. If this is considered, no additional water supply may be available from neighboring utilities' interconnections with Mid and West Counties and that little additional water may be provided to supply South County.

Table 6-14 Water Supply Considerations

Water Service Provider	WUP	Permit Capacity AADF (MGD)	Permit Capacity Peak Day (MGD)
GIWA	718	1.537	1.953
EWD	4866.010	5.360	6.590
CHWA	1512	0.910	1.029
North Port	2923	7.1	8.7
Punta Gorda	871	8.088	11.728
Cape Coral	36-00046-W (SF)	18.04	39.25
	Mid/West County Total	**23.00**	**30.00**
	South County Total	**26.13**	**50.98**
	Potential Total	**41.04**	**69.25**

Table 6-15 Potential Available Water Supply Estimates

Water Service Provider	Current AADD (MGD)	Current Usage	AADD Remaining (MGD)
GIWA	0.91	59%	0.63
EWD	4.10	76%	1.26
CHWA	0.26	29%	0.65
City of North Port	3.50	49%	3.60
City of Punta Gorda	5.43	67%	2.66
Cape Coral	12.89	71%	5.15
Potential Water Available for Mid/West County			**8.80**
Potential Water Available for South County			**7.81**
Total Potential Water Available			**13.95**

Table 6-16 displays the permitted WTP operating capacity and current AADDs for each water service provider. The table indicates that some of the water service providers such as the City of North Port are further limited by their WTP capacity, which will require upgrades if supply were to be provided to CCU. Table 6-17 summarizes the source water and treatment processes for each water service provider. The source water and treatment process should be considered when assessing supply interconnects because blending different water sources can result in varying water quality and impact the compatibility of the PWSs. Significant changes in water quality may justify the need for additional treatment such as corrosion control and require adjustments to water quality sampling procedures. Chapter 8 discusses this further.

Table 6-16 Water Treatment Considerations

Water Service Provider	PWS ID	Plant Capacity MDD (MGD)	AADD (MGD)	MDD (MGD)	Reference*
GIWA	6080104	1.85	0.91	1.22	2021 SS
EWD	6580531	6.00	4.1	Not Available	2021 WCP
CHWA	6080044	0.75	0.3	0.676	2018 SS
City of North Port	6580651	4.40	3.5	Not Available	2020 PSAR
Punta Gorda	6080051	10.0	5.4	9.45	2020 SS
Cape Coral	5360325	30.1	12.89	17.82	2017 WSFWP

*SS=Sanitary Survey, WCP = Water Conservation Plan, PSAR = Public Supply Annual Report, WSFWP = Water Supply Facility Work Plan.

Table 6-17 Source Water and Treatment Compatibility

Water Service Provider	Source Water	Treatment Process	Source/Treatment Compatibility
GIWA	Brackish Groundwater	Reverse Osmosis	Unlikely
EWD	Fresh Groundwater Brackish Groundwater	Lime Softening Reverse Osmosis	Likely
CHWA	Brackish Groundwater	Reverse Osmosis	Unlikely
City of North Port	Brackish Groundwater Myakkahatchee Creek Peace River	Reverse Osmosis Conventional Conventional	Likely
City of Punta Gorda (Mid/West County)	Brackish Groundwater	Reverse Osmosis	Unlikely*
City of Punta Gorda (South County)	Brackish Groundwater	Reverse Osmosis	Likely
Cape Coral	Brackish Groundwater	Reverse Osmosis	Likely

*Refer to Chapter 8 for historical details supporting this finding.

Table 6-18 displays the disinfectant compatibility between CCU's two distribution systems and neighboring interconnects. The Port Charlotte Water System uses monochloramine in the distribution system serving Mid and West County, and the Burnt Store Water System uses free chlorine in the distribution system serving South County. Supply and emergency interconnects must account for the different disinfection methods to maintain compatibility between distribution systems. Additional chemical feed systems and/or operational adjustments would be required to accept and provide flows in which the disinfection chemicals are not compatible. Chapter 8 discusses this further.

Table 6-18 Disinfectant Considerations

Water Service Provider	Disinfectant	Disinfectant Compatibility
GIWA	Chloramine	Yes
EWD	Chloramine	Yes
CHWA*	Chlorine	No
City of North Port	Chloramine	Yes
City of Punta Gorda (Mid/West County)	Chloramine	Yes
City of Punta Gorda (South County)	Chloramine	No
City of Cape Coral	Chlorine	Yes

*Provider plans to convert to chloramine disinfection in 2023-2024.

Table 6-19 and Table 6-20 display additional data relevant to determining conveyance capacities and pipeline limitations associated with using the interconnects with each water service provider. Table 6-19 displays the theoretical flow capacity based on the installed and proposed pipe diameters, and Table 6-20 summarizes the expected length of pipe and metering requirements for the existing and proposed interconnects.

Table 6-19 Theoretical Pipe Flow Capacity

Water Service Provider	Pipe Diameter	Theoretical Pipe Flow Capacity*
GIWA	10-inch 6-inch	0.8 – 2.8 MGD 0.3 – 1.0 MGD
EWD	12-inch	1.2 – 4.0 MGD
CHWA	6-inch 6-inch	0.3 – 1.0 MGD 0.3 – 1.0 MGD
City of North Port	12-inch 6-inch	1.2 – 4.0 MGD 0.3 – 1.0 MGD
City of Punta Gorda (Mid/West County)	24-inch	5.1 – 14.2 MGD
City of Punta Gorda (South County)	12-inch (Proposed)	1.3 – 3.6 MGD
City of Cape Coral	16-inch (Proposed)	2.3 – 7.2 MGD
Potential Conveyance for Mid/West County		**11.0 – 30.9 MGD**
Potential Conveyance for South County		**3.5 – 9.9 MGD**
Total Potential Conveyance		**13.3 – 37.2 MGD**

*Based on maintaining CCU standard pipeline velocity of 2.5 to 8 fps, excludes headloss.

Table 6-20 Infrastructure Considerations

Water Service Provider	Pipe Diameter	Additional Water Main Required	Meter Requirements
GIWA	10-inch 6-inch	None – Currently Connected	Currently Metered
EWD	12-inch	None – Currently Connected	Currently Metered
CHWA	6-inch 6-inch	None – Currently Connected	Requires Two New Meters
City of North Port	12-inch 6-inch	None – Currently Connected	Currently Metered
City of Punta Gorda (Mid/West County)	24-inch	None – Currently Connected	Currently Metered
City of Punta Gorda (South County)	12-inch (Proposed)	0.25 mile	Requires One New Meter
City of Cape Coral	16-inch (Proposed)	0.5 + 5.2 = 5.7 miles*	Requires One New Meter

*Miles within and outside of CCU's service area.

Table 6-21 provides a rate comparison of each water-service provider based on typical residential usage. The data were compiled by CCU's recent rate comparison study and shows that CCU would not likely require a rate increase if purchasing water from neighboring utilities except for CHWA, which has higher rates than CCU. This observation is limited to a residential comparison based on readily available data. Actual rates would be impacted by the negotiation between entities and defined bulk user rates.

Table 6-21 Water Rate Comparison based on Water Usage of 4,000 Gallons

Water Service Provider	Total Costs*
CHWA	$56.55
CCU	$50.58
City of North Port	$44.96
City of Punta Gorda	$43.24
GIWA	$40.30
City of Cape Coral	$32.92
EWD	$28.30

*Total costs based on 5/8-inch x 3/4-inch residential meter connection.
Source: CCU Utility Rate Comparison (effective 03/2022).

6.5.2 Regulatory and Legal Considerations

The regulatory framework for interconnecting PWSs has been established for consecutive systems and is a straightforward process. The PWSs will be required to inform FDEP of the connection and modify sampling plans to account for the distribution system modification. Likewise, SWFWMD reporting requirements will need to be updated and water sales reported in PSARs. CCU is already familiar with the legal steps for developing supply interconnect agreements. PRMRWSA prohibits the sale of PRMRWSA-treated water between member governments; therefore, an exception or modification of the agreement must be

completed to receive water from the City of North Port and potentially EWD and Punta Gorda since they are listed on the PRMRWSA 20-year OFWUP.

6.5.3 Advantages and Disadvantages

The primary advantages to using neighboring interconnects for supply are:

- Provides water already treated by supplier.
- May require disinfectant conversion.
- Is commonly permitted.
- Benefits both utilities.
- Increases resilience.
- Has fairly low capital and O&M costs.
- Involves simple operation.
- May be obtained at a reduced cost based on rates.

The primary disadvantages are:

- Provides little supply for Mid and West County and only partial supply available for South County.
- Requires transmission upgrades for the Burnt Store Water System connections.
- Likely requires distribution system modifications for water quality.
- Requires PRMRWSA agreement modifications.
- May require corrosion control for water compatibility.

6.6 Regional Water Supply Options Evaluation

The data presented in Section 6.1 through Section 6.5 were used to perform a qualitative analysis of each regional water supply option. Through a series of workshops, CCU and Jones Edmunds staff developed the following categories to evaluate each water supply option considering CCU's goals of affordability, sustainability, efficiency, and reliability:

- Water Supply Availability – Availability of future water supply with respect to future water demands.
- Additional Conveyance Infrastructure – The extent of required infrastructure needed to connect to the potable water distribution system.
- Minimization of Additional Treatment – The extent of additional treatment required based on existing WTP or WBS operations.
- Ease of Operation – The extent of additional training required with respect to current operations.
- Regulatory Considerations – The ease of implementation with respect to governing agency objectives and regulations.
- Regional Support (Co-Funding Opportunities) – The likelihood of opportunities for funding support.
- Relative Cost (Total and O&M) – The general extent of County expenditure required for implementation compared to each option.

The evaluation used qualitative scores of Good, Fair, and Poor to develop a relative ranking and establish the best available option for meeting CCU's goals and needs. Table 6-22 provides the justification and Table 6-23 the relative ranking for each water supply option.

Table 6-22 Port Charlotte Water System Water Supply Options Summary

Options	Water Supply Availability	Additional Conveyance Infrastructure	Minimization of Additional Treatment	Ease of Operation	Regulatory Considerations	Regional Support (Co-Funding Opportunities)	Relative Cost (Total and O&M)	Relative Ranking
Babcock Ranch Supply	Good – Groundwater available to meet future conditions. WUP needs to be modified and renewed for additional allocation.	Poor – Requires extensive transmission main construction.	Poor – Requires new RO WTP and water source blending in Mid County.	Good – Brackish groundwater requires RO treatment, basic aeration and disinfection treatment.	Good – Potential for expansion since outside SWUCA, typical WUP modification, RO WTP and conveyance permits.	Fair – SWFWMD and SFWMD co-funding needs to be evaluated.	Fair – Requires new wells, RO WTP, and transmission mains.	Good
PRMRWSA Expansion	Fair – Assumes supply is available.	Fair – Requires moderate transmission main construction.	Good – Minor Upgrades at WBSs.	Good – No change in current treatment.	Good – District and FDEP support Authority.	Fair – District, grant funding opportunity/ co-funding. However, District limits funding for larger projects.	Poor – Requires transmission main and PRMRWTF upgrades.	Good
West County Brackish or Saline WTP	Fair – Partial supply is available.	Good – Reduces need for Mid-to-West County transmission mains.	Poor – Requires new brackish WTP.	Good – Operators are familiar with membrane WTP.	Poor – Area within SWUCA, against District goals.	Fair – May have support if used regionally.	Poor – Significant capital and O&M costs.	Fair
Direct Potable Reuse (EP)	Fair – Partial supply is available.	Poor – Requires WRF piping, conveyance, and tie in to PWS.	Poor – Requires additional treatment at WRF or WTP.	Poor – Requires specialized treatment.	Fair – Unknown permitting and regulatory framework.	Fair – FDEP and District support.	Fair – Requires advanced treatment and storage.	Fair to Poor
Neighboring Interconnects	Poor – Limited supply is available.	Poor – Requires transmission upgrades for significant flows.	Good – May require disinfectant conversion.	Good – No change in current treatment.	Good – Common permit modifications.	Good – Potential costs sharing with neighboring utilities.	Fair – Requires transmission main upgrades.	Poor – Supply is limited.

Table 6-23 South County Water Supply Options Summary

Options	Water Supply Availability	Additional Conveyance Infrastructure	Minimization of Additional Treatment	Ease of Operation	Regulatory Considerations	Regional Support (Co-Funding Opportunities)	Relative Cost (Total and O&M)	Relative Ranking
Babcock Ranch	Good – Groundwater available to meet future conditions. WUP needs to be modified and renewed for additional allocation.	Poor – Requires extensive transmission main construction.	Poor – Requires new RO WTP and water source blending in Mid County.	Good – Staff familiar with RO treatment.	Good – Potential for expansion since outside SWUCA; typical WUP modification, RO WTP and conveyance permits.	Fair – SWFWMD and SFWMD co-funding needs to be evaluated.	Fair – Requires new wells, RO WTP, and transmission mains.	Good
PRMRWSA Expansion	Fair – Assumes supply is available.	Fair – Requires moderate transmission main construction.	Fair – Requires disinfectant conversion.	Fair – change in distribution system disinfectant.	Good – District and FDEP support Authority.	Fair – District, grant funding opportunity/ co-funding. However, District limits funding for larger projects.	Poor – Requires transmission main and PRMRWTF upgrades.	Good to Fair
New Groundwater Wells	Poor – Partial supply is available.	Fair – Requires local raw water well piping (or up to 6 miles if from Zemel Road).	Good – No expansion for near-term condition. Fair – Requires Burnt Store WTP expansion.	Good – No change in current treatment.	Good – For installing wells included in the current permit. Poor – For installing new wells in the SWUCA.	Poor – Limited to no support from region.	Good – Requires WTP upgrade and more supply wells.	Fair
Direct Potable Reuse	Poor – Partial supply is available.	Good – Requires minor WRF/WTP piping.	Poor – Requires additional treatment at Burnt Store WRF or WTP.	Poor – Specialized Treatment.	Fair – Unknown permitting and regulatory framework.	Fair – FDEP and District support.	Fair – Requires advanced treatment and storage.	Fair to Poor
Neighboring Interconnects	Poor – Partial supply is available.	Fair – Requires ≈0.25 mile of pipeline for Punta Gorda and 5.7 miles for Cape Coral.	Good – None with Cape Coral; requires disinfectant conversion with Punta Gorda.	Fair – Minor pressure and flow operations.	Good – Common permit modifications.	Good – Potential cost sharing with neighboring utilities.	Good – Minor O&M costs, minor capital costs.	Fair to Good

6.7 REGIONAL WATER SUPPLY RECOMMENDATIONS

Based on the evaluation of the water supply options presented in this Chapter, each option was determined to provide a certain level of viability with respect to Mid/West County and South County. The results from the evaluation are described herein and organized into near-term and long-term recommendations.

6.7.1 OPTION 1 – BABCOCK RANCH

The development of the Babcock Ranch wellfield offers numerous benefits to Charlotte County from a water-supply standpoint. As indicated in the *Countywide Reverse Osmosis Feasibility Study* (Malcom Pirnie, 2008b), Babcock Ranch may be the only wellfield location that could provide significant quantities of water from a single location, as opposed to numerous geographically dispersed wellfields (discussed in Option 3). This may allow a reasonable, economically feasible approach for withdrawal and treatment of water from a single treatment facility.

The advantages to using the Babcock Ranch supply are that it is expected to have sufficient capacity to meet future flow demands for the County. The wellfield can likely be expanded because it is outside the SWUCA. Additionally, expanding Babcock Ranch can potentially be supported financially with regional co-funding opportunities. The water cannot be used or sold to other water service providers, but it may be used to offset PRMRWSA demands and allow PRMRWSA to provide additional flow to other regional members. This would increase the resilience and sustainability of CCU's PWSs and may have the possibility of serving as an emergency supply option for the region pending the State agreement. The disadvantages are that developing Babcock Ranch wellfield has a substantial capital cost and requires a new RO WTP. In addition, connecting the wellfield to the Mid or South County areas requires extensive transmission main construction.

The near- and long-term recommendations for Option 1 include:

- Near-term:
  - CCU should proceed with additional hydrogeological investigations including aquifer performance testing and groundwater flow models to determine precise safe yield for the Babcock Ranch wellfield.
  - CCU should proceed with modifying the Babcock Ranch WUP to increase supply in accordance with aquifer performance and groundwater modeling results, and change the permit conditions from an emergency supply to consumptive use.
  - CCU should proceed with a preliminary design of raw and finished water pipelines, associated facilities, and a new 8-MGD RO WTP. Design of facilities should consider subsequent phased 8-MGD capacity expansions to achieve 16 MGD (20-MGD raw water) and 24 MGD (30-MGD raw water).
- Long-term:
  - The Babcock Ranch supply is a viable source in meeting CCU's future water-supply needs for Mid County, South County, and East County. Additional transmission system pipelines should be installed to meet future demands and increase resiliency while the WTP should be expanded to meet future demands as needed.

6.7.2 Option 2 – Increase PRMRWSA Allocation

PRMRWSA remains a viable option for addressing CCU's future water supplies. Since the system already provides finished water to Mid and West County, the existing infrastructure is readily available to address the near-term needs. As discussed previously, CCU is supporting the extension of the RTS, and has entered an agreement with PRMRWSA to construct the RTS 42-inch-diameter Phase IIB pipeline. Charlotte County has been a long-time customer and member government of the PRMRWSA in support of the PRMRWSA's objective to provide regional water supplies with a focus on reliability, resilience, and sustainability. The County should continue working with PRMRWSA to reserve additional water supply when it is needed to meet future water supply needs, as it is deemed cost-effective.

This option is well defined and straightforward from a legal and regulatory perspective. The PRMRWSA agreement is already established and defines the responsibilities of each entity from an operational and cost perspective. In addition, regulatory agencies support regionalization efforts, which will assist in the WUP process and provide co-funding opportunities for regional projects.

Increasing CCU's allocation is expected to require major upgrades to the PRMRWTF, which will have significant costs. PRMRWSA has indicated that the Reservoir 3 and PRMRWTF Expansion project is required to increase PRMRWSA supply by 18 MGD, which could be available to CCU and other member governments as early as 2028.

The near- and long-term recommendations for Option 2 include:

- Near-term:
  - Complete construction of the PRMRWSA RTS Phase IIB 42-inch-diameter pipeline. Once built, the pipeline will serve as a new redundant Myakka River finished water pipeline crossing along Campbell Street. Furthermore, the Phase IIB pipeline has replaced CCU's former plan to construct a redundant Myakka River crossing along SR-776 (S. McCall Road).
- Long-term:
  - CCU should continue to support the regionalization of PRMRWSA to increase water system and supply resilience for the Port Charlotte Water System. The purchase of additional water supply should be contingent on confirming the yield of the Babcock Ranch water supply and securing a new WUP.

6.7.3 Option 3 – New Groundwater Wells

Spatial water-demand projections for the Port Charlotte Water System indicate that a significant portion of future water demand occurs in West County, which drives the need to upgrade conveyance infrastructure (pipelines and WBSs) in Mid County. A new groundwater supply and WTP sited in West County would reduce the amount of infrastructure required for transferring water from the Mid County interconnects to West County. Preliminary modeling indicates that only minor upgrades at the Walenda WBS and a few piping transmission upgrades would be required if an 8.0-MGD WTP was installed at the Rotonda WBS. However, the installation of new groundwater wells in West County is expected to

encounter resistance in WUP permitting since the wellfield would be in the SWUCA. The option is less viable than the previous options, but CCU could implement aquifer replenishment projects such as surface water or reclaimed water aquifer recharge for establishing net benefits, which could be used in negotiating WUPs with SWFWMD. The new WTP would likely require RO process treatment based on historical groundwater quality.

The Burnt Store Water System has similar long-term regulatory constraints but can install four new wells under its current WUP. For long-term supply, CCU should consider investigating the option of increasing its permitted AADF allocation from 3.65 to 4.67 MGD and include the cost of doubling the capacity (7.3 MGD MDD) of the RO WTP to meet future supply. This cost should consider the feasibility of Option 1 to determine which option is more economical and meets the County's goals of resilience and sustainability. A new WTP at Babcock Ranch could not only increase resilience to the supply of South County but could serve Mid County and portions of East County.

The near- and long-term recommendations for Option 3 include:

- Near-term:
  - CCU should complete an inventory of the CCU wells in West County and confirm the condition (abandoned, capped, plugged) and permitted status (active or inactive) to determine feasibility of reusing these components for future water supply.
  - CCU should construct the four additional wells that are currently permitted in the Burnt Store RO WTP WUP to increase water supply in the Burnt Store Water System. Siting should consider areas northeast of the facility farther from the coastline and development such as along Zemel Road.
  - CCU should develop a capacity analysis report and condition assessment of the Burnt Store RO WTP to determine the costs for expanding the WTP capacity to meet future conditions. The information should be considered when assessing the economics of Option 1.
- Long-term:
  - Installing new groundwater wells and a WTP in West County would be largely impacted by CCU's ability to obtain a significant WUP in the SWUCA. As discussed in the *Reclaimed Water Master Plan* (Jones Edmunds, 2022), CCU should conduct an aquifer recharge study to determine the impacts that aquifer recharge would have to groundwater in the region and whether net benefits could be obtained from SWFWMD. The study should include alternative water supplies such as stormwater and surface-water in addition to reclaimed water.
  - Based on the results of the near-term studies, CCU could convert the Rotonda WBS into a WTP to serve West County and reduce conveyance requirements in the Port Charlotte Water System or increase the resilience.
  - Based on the results of the near-term studies, CCU could also expand the capacity of the Burnt Store RO WTP to serve the Burnt Store Water System in South County.

6.7.4 Option 4 – Potable Reuse

Potable reuse is a fair option to explore in the Mid and South County areas. As discussed in the *Reclaimed Water Master Plan*, the reclaimed water produced at the Rotonda and West

Port WRFs is expected to be conveyed to golf courses in the area, which prevents large irrigation users from drawing from the aquifer and minimizes new conveyance infrastructure requirements. The East Port WRF and Burnt Store WRF, in Mid and South Counties, respectively, have excess reclaimed water in future conditions and therefore do not compete with alternative reclaimed water uses such as irrigation.

As discussed in the *Reclaimed Water Master Plan* (Jones Edmunds, 2022), the Master Reuse System's conveyance systems are limited under future conditions, and CCU must make significant upgrades to convey excess reclaimed water produced in Mid County to West County. Alternatively, the reclaimed water could be used for potable reuse, which provides CCU with a much higher rate of return based on current reclaimed and potable water rates. Water and reclaimed water projections indicate that the East Port WRF will not have enough capacity to satisfy both future irrigation users and meet potable water demands.

Conversely, reclaimed flow projections for the Burnt Store WRF indicate that future irrigation demands and the potable water demands could be met (excluding treatment losses). The Burnt Store WRF is close to the existing RO WTP and contains two deep injection wells and two potable water supply wells (Wells 15 and 16) on the site. The deep injection wells are expected to be required for disposal of concentrate from a potable reuse treatment process, and the supply wells could potentially be re-purposed for an IPR application. This site provides the most flexibility with implementing a DPR or IPR process.

The near- and long-term recommendations for Option 4 include:

- Near-term:
  - CCU should consider conducting a detailed potable reuse feasibility study to determine if potable reuse is economically feasible, socially acceptable to the community, and the best use of CCU's reclaimed water supply. AWTFs should be considered for the Burnt Store WRF location, and considerations for IPR should be explored as part of the study. Note the term AWTF refers to multi-barrier facilities capable of meeting primary and secondary drinking water standards.
- Long-term:
  - Regulatory framework is expected to be defined in coming years, and public acceptance of the concept will increase with promotion of State education campaigns. CCU should continue to monitor DPR/IPR regulations and assess the feasibility of implementing DPR/IPR from an environmental, social, and economical perspective.

6.7.5 Option 5 – Neighboring Interconnects

In support of regional water supply efforts, CCU has implemented several emergency interconnects with neighboring water service providers in the Port Charlotte Water System. However, CCU is the largest water service provider in the region, and the forecasted supplies available from the neighboring water service providers are not expected to fulfill 2045 water demands based on a review of the current flows and WUPs. In addition, if these interconnects are used for normal water supply, they cease to become used for emergencies, which could decrease the resilience of the CCU system. Therefore, emergency

interconnects are recommended for resilience but not supply purposes for the Port Charlotte Water System.

The Burnt Store Water System does not currently have emergency interconnects; therefore, conveyance infrastructure would be required to develop supply interconnects with neighboring systems. The Cities of Punta Gorda and Cape Coral were shown to have significant capacity to provide CCU with water based on current flows, but how much each water service provider will need to satisfy future flows within their own services areas is unclear. As such, installing emergency interconnects for these entities is more likely. Considerations should be made to account for the compatibility of the disinfection methods implemented by the neighboring utilities and CCU's Burnt Store Water System.

The near- and long-term recommendations for Option 5 include:

- Near-term:
  - CCU should review all emergency interconnect agreements and conduct modeling scenarios to confirm actual limitations in using the Mid and West County interconnects during an emergency. Scenarios should be completed for providing water to and from CCU and to confirm quantities available based on current WUP for each water-service provider.
  - CCU should develop an emergency interconnect with Punta Gorda to increase the resilience of the Burnt Store Water System in the near term.
  - CCU should consider implementing a valve-exercising campaign to ensure that large valves on the interconnects will operate when needed.
- Long-term:
  - CCU should work with regional Mid and West County stakeholders to develop a regional water model that can be used to assess overall resilience of the regional water supply and confirm the water supply allocations from emergency interconnects based on their actual network infrastructure.
  - CCU should install emergency interconnects with Cape Coral and FGUA-Fort Myers water service providers in Lee County once their infrastructure is extended closer to the Burnt Store Water System (i.e., the Lee and Charlotte County lines).

7. POTABLE WATER DISTRIBUTION SYSTEMS MODELING

OVERVIEW

Chapter 6 presented and ranked the water supply options for the Port Charlotte and Burnt Store Water Systems. This chapter describes the County's existing potable water distribution system models and the planning criteria used to evaluate the current and future demand conditions as well as the hydraulic improvements required to implement the recommended water supply options through the 2045 planning period.

7.1 Hydraulic Models Overview

Hydraulic modeling analysis is a critical tool for master planning efforts and perhaps the best way to evaluate distribution system performance, with the capability to identify system deficiencies under various demand scenarios. CCU's Port Charlotte Water System and Burnt Store Water System are represented by two separate Bentley WaterGEMS models since the systems are not interconnected. Jones Edmunds maintains a hydraulic model for CCU's current Port Charlotte Water System and developed a hydraulic model for the current Burnt Store Water System as part of this master planning effort. The models were updated and calibrated to current system conditions using historical data presented in Section 4.4. For this chapter, *current system* refers to the time at which these hydraulic models were updated and calibrated. Throughout this master planning effort, CCU staff coordinated with Jones Edmunds through meetings and discussions to inform ongoing issues and projects to best demonstrate the current condition of the distribution system infrastructure and pumping operations. Following this report, the models will be representative of CCU's actual system and may be further used for purposes such as evaluating new customer connections and developer design plans, troubleshooting existing system issues, and supporting current or future infrastructure projects.

The Port Charlotte Water System model consists of approximately 1,500 miles of water main sized between 6 and 36 inches, six active water WBSs that include four GSTs with a total capacity of 10 MG, seven supply interconnects with PRMRWSA, and seven emergency interconnects with neighboring water utilities. This differs slightly from the data presented in Chapter 2, as it includes some of the PRMRWSA transmission mains supplying the interconnects along Kings Highway. The model also excludes small-diameter water mains assumed to be primarily service connections. Ackerman WBS is excluded for the current condition evaluation but included in the future condition; Ingraham WBS is not included in the current or future analysis because it does not serve as a WBS but only a chemical boosting station.

The Burnt Store Water System model consists of 64 miles of water main sized between 2 and 20 inches and the Burnt Store RO WTP, which includes three 0.5-MG GSTs. Because the Burnt Store Water System does not have WBSs, chemical injection systems, or interconnects with neighboring water utilities, pressure and flow are provided solely from

the HSPS at the Burnt Store WTP. Table 7-1 and Table 7-2 summarize details for the supporting facilities and pump operations for the Port Charlotte Water System and Burnt Store Water System models, respectively. Figure 7-1 illustrates the CCU water distribution system models with which the hydraulic analysis was conducted under current conditions.

Table 7-1 Current Port Charlotte Water System Infrastructure and Model Inputs

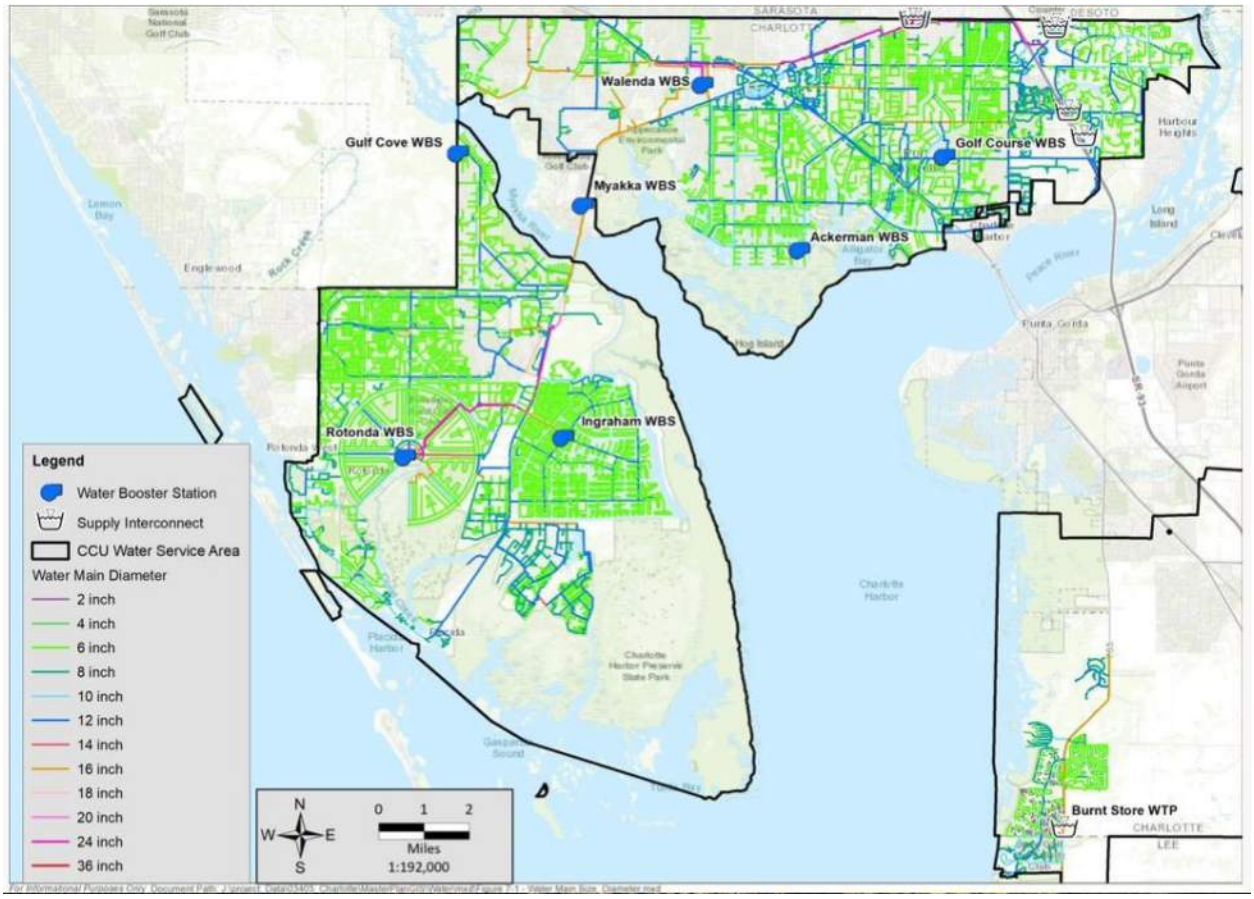
Water Distribution Facilities	Storage Facilities	Pump Station	
		No. of High-Service Pumps	Pump Description
Port Charlotte Golf Course WBS	GST: 1-MG	2	Two 1,500-gpm @ 225 feet (VFD pressure setpoint 80 psi)
Gulf Cove WBS	GST: 2-MG	4	Two 700-gpm @ 152 feet Two 800-gpm @ 182 feet (VFD pressure setpoint 75 psi)
Walenda WBS	GST: 2-MG	5	One 1,200-gpm @ 175 feet One 1,000-gpm @ 186 feet One 1,200-gpm @ 143 feet One.1,000-gpm @ 148 feet One 820-gpm @ 164 feet (VFD pressure setpoint 80 psi)
Rotonda WBS	GST: 5-MG	4	Two 1,200-gpm @ 200 feet Two 700-gpm @ 170 feet (VFD pressure setpoint 68 psi)
Englewood WBS	None	2	Two 1,000-gpm @ 90 feet
Myakka WBS	None	3	Three 1,500-gpm @ 80 feet

Note: VFD = variable-frequency drive.

Table 7-2 Current Burnt Store Water System Infrastructure and Model Inputs

Water Distribution Facilities	Storage Facilities	Pump Station	
		No. of High-Service Pumps	Pump Description
Burnt Store RO WTP	GSTs: 0.5-MG (Three Total)	5	One 1,670 gpm @ 192 feet Two 500 gpm @ 185 feet Two 300 gpm @ 150 feet

Figure 7-1 CCU Distribution System Model



7.2 HYDRAULIC MODEL DEVELOPMENT, UPDATES, AND CALIBRATION

After verifying the current system conditions with CCU staff, Jones Edmunds developed and/or updated the models to reflect the current potable water distribution system storage and pumping capacities for each WBS, new pipelines, and existing potable water customer demands. Actual pump operational pressures were assigned to respective pumps for each facility in the hydraulic models based on data provided by CCU.

The Port Charlotte Water System model was calibrated using SCADA data to validate that model results are indicative of actual system behavior. Jones Edmunds analyzed 10 years of historical data provided by CCU to identify days that best represent the historical average AADD and MDD conditions; the selected SCADA data were January 2, 2019, and May 7, 2018, for AADD and MDD, respectively. Model calibration was accomplished by simulating actual flows and pressures at each facility while simultaneously evaluating the change in WBS storage tank capacity over 15-minute to 1-hour periods; the storage tank behavior was then applied to the model over 24 hours.

Hydrant pressure field testing was performed to calibrate the new Burnt Store Water System model. Following model simulation of field-tested hydrant pressures, pipe roughness coefficients (Hazen-Williams C-values) were adjusted in the model until modeling results were satisfactory. Lastly, Burnt Store RO WTP flow data provided by CCU for March 10, 2021, was selected to represent actual system behavior to further calibrate the model.

The calibration was determined satisfactory when the model-predicted results came within an accuracy of ± 5 percent of field data. As a part of the calibration process, the model was run for an extended-period simulation (EPS) with a 24-hour average day diurnal pattern applied to the customer demands. The diurnal pattern was adjusted during the calibration process to achieve pump station flows in the service area that closely matched SCADA data.

This process of model development and calibration provides hydraulic models that can accurately simulate current and future demand scenarios for the Port Charlotte Water System and Burnt Store Water System. Results from these hydraulic models provide the confidence necessary to make future planning decisions and implement CIPs through the 2045 planning period.

7.3 Modeling Analysis and Level of Service Criteria

Each hydraulic model was used to evaluate CCU's potable water distribution systems with respect to (1) storage capacity, (2) pipeline capacity, (3) and pumping capacity under the current (2020) and future (2045) conditions. Additionally, a fire flow analysis was conducted on the current systems to identify hydrant fire flow deficiencies. Planning for modeling analyses of the current and future CCU potable water distribution systems included reviewing applicable rules, regulations, and Charlotte County codes. At the state level, the main regulatory drivers are specified in Chapter 62-555, FAC, *Permitting, Construction, Operation, and Maintenance of Public Water Systems*, and Chapter 633, FS, *Fire Prevention and Control.*

To ensure that sufficient finished water storage exists for the Port Charlotte Water System and Burnt Store Water System, this analysis evaluated the systems against two separate criteria – reserve storage capacity and operational storage capacity. The reserve storage requirements were determined in accordance with Section 62-555.320(19), FAC, which states storage capacity connected to a water system shall equal at least 25 percent of the MDD plus fire flow demand (FFD), where FFD refers to excess capacity made available solely for fire protection purposes – calculated as a product of the required flowrate and duration. Table 7-3 identifies CCU's LOS criteria used for modeling, including FFD. As a conservative approach, FFD was applied using the Commercial Fire Flow condition. Additionally, the FAC Rule allows storage capacity requirements to be satisfied by water supply source facilities, so long as adequate capacity exists (applies to the Port Charlotte Water System only as a consecutive PWS). For operational storage, the capacity requirements were developed as a modeling BMP discussed herein to accommodate considerations for system resiliency and storage facility pumping operations. First, the flow equalization capacity was determined based on the time-of-day diurnal pattern to meet demands that exceed the MDD. Then, pumping operational storage capacity was determined as additional storage capacity based on tank water levels and pump start/stop ranges. Lastly, the operational storage analysis included FFD capacity as calculated for reserve storage capacity.

Table 7-3 LOS Criteria

Item	Criteria	Condition	Reference
FFD	1,000 gpm for 2 hours	Residential Fire Flow	CCU
	1,250 gpm for 2 hours	Commercial Fire Flow	
Headloss	10 feet/1,000 feet (maximum)	Normal Demand	AWWA
Velocity	7 fps (maximum)	Normal Demand	AWWA
Transmission Main Pressure (8 inches or higher)	45 psi (minimum)	Normal Demand	CCU
	85 psi (maximum)	Normal Demand	
Distribution Main Pressure (6 inches or lower)	45 psi (minimum)	Normal Demand	CCU
	80 psi (maximum)	Normal Demand	
	20 psi (minimum)	MDD + Fire Flow Demand	
	50 psi (minimum)	Peak Hour Demand	

The next analysis conducted was to evaluate the hydraulic capacity of the transmission and distribution pipelines. As opposed to the storage analysis, FFD for this analysis was applied as a flowrate (gpm) rather than calculated for capacity; commercial fire flow was used again as a conservative measure. Table 7-3 depicts the additional LOS criteria for which modeling results were compared against to identify deficiencies and recommend necessary improvements. The LOS criteria include standards for system pressures transmission pipeline velocities, and FFD and were based on existing system performance characteristics, past criteria used by the County, and current industry standards.

Pumping capacity should be designed in accordance with Section 62-555.320(15), FAC, which requires capacity to sufficiently meet MDD conditions, plus FFD, and maintain a minimum pressure of 20 psi throughout the water system. For this analysis, peak hourly demand (PHD) was naturally included in the models as part of the 24-hour EPS of the MDD condition along the calibrated diurnal curve. Similar to the hydraulic analysis, commercial FFD was applied as a flowrate. As required by the FAC, pump redundancy is a critical aspect of reliability and should be provided whenever possible to enable repair or replacement without impacting operations. Each pump station should provide sufficient capacity to match demand if the largest pump is out-of-service (also known as firm pumping capacity). Therefore, for future systems, adequate pumping capacity is based on total pumping capacity with the largest pump out-of-service.

7.4 Current System Hydraulic Analysis

This section presents the results of the hydraulic modeling analysis under current flow and infrastructure conditions for each potable water distribution system. The section presents the Port Charlotte and Burnt Store Water Systems separately since the distribution systems are independent of each other.

7.4.1 Mid/West County – Port Charlotte Water System

The current condition AADD and MDD for the Port Charlotte Water System modeling analysis was taken as 10.23 MGD and 14.49 MGD, respectively.

7.4.1.1 Storage Capacity Analysis

The reserve storage capacity and operational storage capacity analysis was conducted as described in Section 7.3 to determine if sufficient finished water storage exists for the current condition in the Port Charlotte Water System to meet state regulations and maintain optimal performance. Table 7-4 and Table 7-5 provide the results of the reserve and operational storage capacity analysis, respectively.

Table 7-4 Current Port Charlotte Water System Reserve Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Historical 2019 MDD	14.49 (MGD)
25 Percent MDD	3,622,500
FFD	150,000
Required Storage Capacity	**3,772,500**

Table 7-5 Current Port Charlotte Water System Operational Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Flow Equalization[1]	2,455,200
Pumping Operations[1]	651,300
FFD	150,000
Required Storage Capacity	**3,256,500**

[1] Determined based on flow pattern data and facility information provided by CCU.

Therefore, as shown the reserve storage and operational storage capacity analyses indicated a minimum storage requirement of approximately 3.77 MGD and 3.26 MGD, respectively. With respect to the current Port Charlotte Water System finished storage capacity of 10 MG, the analyses indicated no finished water storage deficiencies exist under current conditions.

The four WBSs that include GSTs (Golf Course 1-MG, Walenda 2-MG, Gulf Cove 2-MG, and Rotonda 5-MG) were reviewed independently to determine if adequate system storage was available under current demand conditions. Modeling simulations indicated tank turnover was between one and three times per day. The daily turnover goal should be at a minimum of once per day to prevent water quality issues, which was achieved in the Port Charlotte Water System storage tanks according to the calibrated water distribution model.

In addition to adequate storage in the Port Charlotte Water System, PRMRWSA maintains six 2-MG finished water GSTs (for a total capacity of 12 MG) for use by Charlotte County and other PRMRWSA customers to accommodate peak flow conditions, FFD, or emergency backup. Based on this analysis, the Port Charlotte Water System would not be required to use PRMRWSA storage under current conditions.

7.4.1.2 Pipeline Capacity Analysis

The current condition hydraulic model for the Port Charlotte Water System was used to assess the current system operations and pressures. The purpose was to determine limitations in the current system's ability to distribute water under various current condition demand scenarios, while maintaining the County's LOS as noted in Table 7-3. No deficiencies found were in the current system scenario.

7.4.1.3 Pumping Capacity Analysis

The pumping capacity analysis was performed with the information presented in Section 7.1; Table 7-6 presents the results of the analysis. In general, CCU's WBS have adequate pumping capacity to meet MDD plus FFD scenarios. The West County service area consists of three WBSs that collectively supply the demands in the West County service area, as shown in Table 7-6. A model trace was completed to determine West County maximum day service area demands. As Table 7-6 indicates, the West County system can collectively supply maximum day plus fire demands. A similar analysis was conducted for Mid County, which contains two WBS. The Golf Course WBS is shown to have a pumping capacity deficiency of approximately 900 gpm when considering FFD requirements, but this is due from a modeling limitation. In actuality, the County would address fire flow deficiencies at this WBS by using the PRMRWSA interconnects near the WBS service area. Therefore, no improvements are recommended to address deficiencies identified by this analysis.

7.4.1.4 Fire Flow Analysis

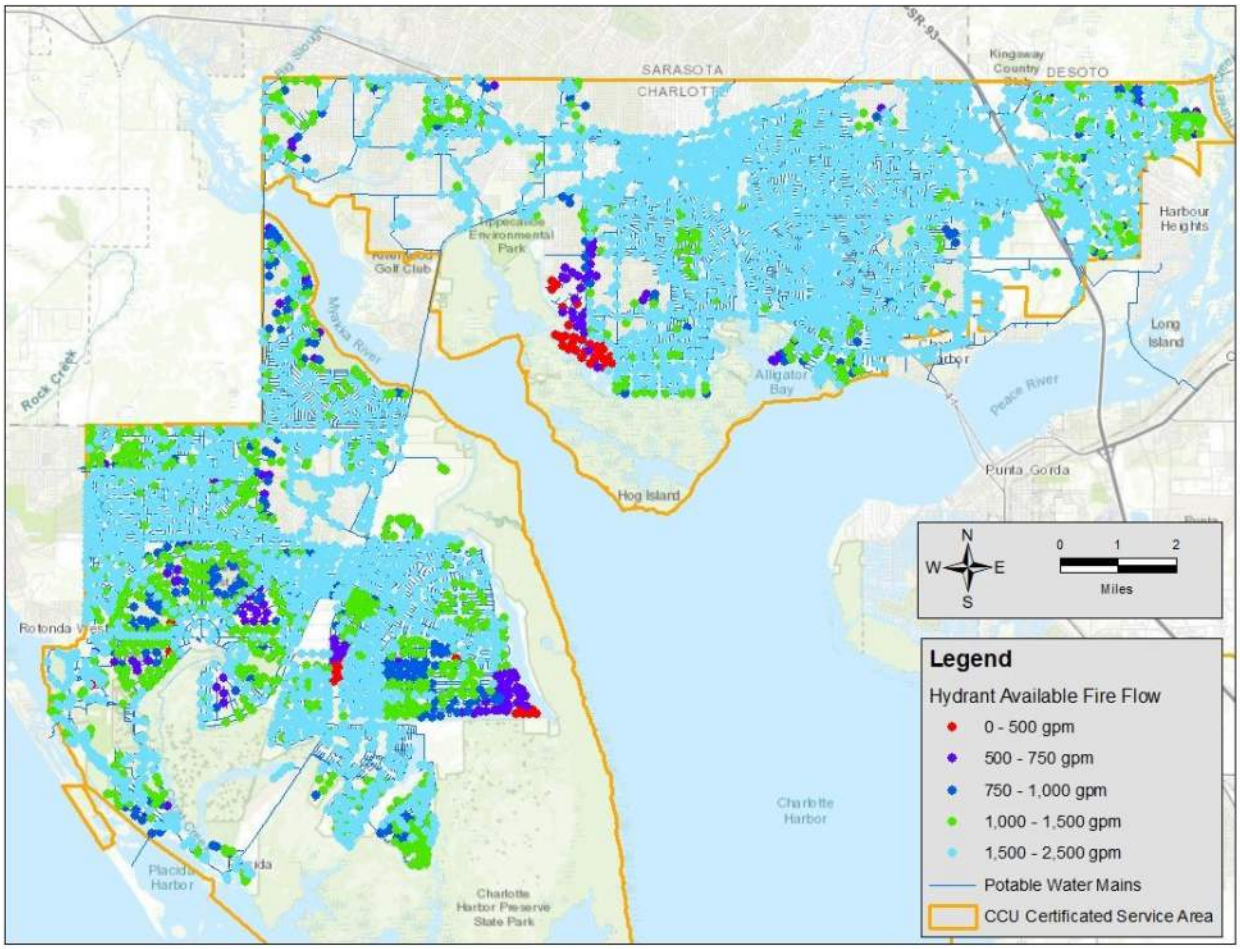
In Chapter 3 discusses, a fire protection spatial analysis was conducted to determine hydrant coverage throughout the Port Charlotte Water System. In addition to that analysis, a fire flow scenario was simulated for the hydrants in the Port Charlotte Water System, assuming hydrants were in place as required by the hydrant coverage analysis completed in Chapter 3. Figure 7-2 displays the results predicting that most hydrants in the Port Charlotte Water System can provide the minimum fire flow requirement of 1,000 gpm. Some areas were unable to meet the minimum required fire flow. Including the area near the proposed Ackerman WBS that has closed valves to direct water flow through the system to improve water quality. Other areas not meeting the minimum fire flow requirement are suspect to occur on dead-end lines or associated with smaller-diameter (less than 6-inch) pipes. Given the number of hydrants that CCU maintains, some GIS records may likely have been incorrectly recorded. CCU should conduct field investigations to further evaluate hydrant deficiencies. If the pipe size is inadequate to support the fire flow, an improvement project should be generated. Appendix E provides a standard operating procedure to be used during field testing.

Table 7-6 Current Port Charlotte Water System Pumping Analysis

Location	Pump Station	Pump Unit	Rated Capacity		Total Pump Station Capacity		Firm Capacity		Service Area Maximum Day Demand[1]	Maximum Fire Flow[2]	Surplus / (Deficit) (MGD)
			gpm	MGD	gpm	MGD	gpm	MGD	gpm	gpm	gpm
Mid County Pump Stations	Golf Course WBS	1	1,500	2.16	3,000	4.32	1,500	2.16	1,110	1,250	(860)
		2	1,500	2.16							
	Walenda WBS	1	1,200	1.73	5,220	7.52	4,400	6.34	2,783	1,250	367
		2	1,200	1.73							
		3	1,000	1.44							
		4	1,000	1.44							
		5	820	1.18							
West County Pump Stations	Myakka WBS[3]	1	1,500	2.16	4,500	6.48	3,000	4.32	2,763	1,250	5,288
		2	1,500	2.16							
		3	1,500	2.16							
	Rotonda WBS	1	1,200	1.73	3,800	5.47	3,100	4.46			
		2	1,200	1.73							
		3	700	1.01							
		4	700	1.01							
	Gulf Cove WBS	1	700	1.01	3,000	4.32	2,200	3.17			
		2	700	1.01							
		3	800	1.15							
		4	800	1.15							
	Englewood WBS[4]	1	1,000	1.44	2,000	2.88	1,000	1.44			
		2	1,000	1.44							

[1] Service area demands were obtained from the hydraulic model by performing a trace.
[2] Fire flow of 1,250 gpm used for this analysis.
[3] Myakka WBS is in Mid County but is solely used to supply West County therefore it contributes to the pumping capacity in West County.
[4] Englewood WBS is primarily used to boost pumping capacity in the event of a fire, or as needed.

Figure 7-2 Port Charlotte Water System Fire Flow Analysis



7.4.1.5 RECOMMENDED IMPROVEMENTS

Table 7-7 summarizes the results from the modeling analysis conducted herein to evaluate the capacity and hydraulic performance of the existing Port Charlotte Water System. Generally, the current Port Charlotte Water System evaluation resulted in satisfactory performance with respect to minimum CCU LOS standards as specified in Table 7-3. The pumping capacity analysis identified deficiencies at Golf Course WBS during the maximum day plus fire flow analysis. However, the County will allow deficiencies to be mitigated through PRMRWSA interconnects near the Golf Course WBS during fire flow events, and no improvements were recommended based on this analysis. Additionally, the fire flow analysis conducted identified areas in Mid/West County unable to provide the minimum fire flow requirement. It is recommended for the County to further investigate areas of concern. Section 9.1 discusses the further investigations required. Lastly, once the Ackerman WBS is installed to improve water quality within the area, the County should open closed valves along Flamingo Boulevard, which will increase the available fire flow at the hydrants in this area.

Table 7-7 Current Port Charlotte Water System Analysis Summary

Storage Capacity	Pipeline Capacity	Pumping Capacity	Fire Flow
Satisfactory	Satisfactory	Satisfactory	Non-satisfactory

7.4.2 South County – Burnt Store Water System

The current condition AADD and MDD for the Burnt Store Water System modeling analysis were taken as 0.43 MGD and 0.69 MGD, respectively.

7.4.2.1 Storage Capacity Analysis

To determine if sufficient finished water storage exists for the current condition Burnt Store Water System to meet state regulations and maintain optimal performance, a reserve storage capacity and operational storage capacity analysis was conducted as described in Section 7.3. Table 7-8 provides the results of the reserve storage capacity analysis. Table 7-9 provides the results of the operational storage capacity analysis.

Table 7-8 Current Burnt Store Water System Reserve Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Historical 2019 MDD	0.69 (MGD)
25-Percent MDD	172,000
FFD	150,000
Required Storage Capacity	**322,000**

Table 7-9 Current Burnt Store Water System Operational Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Flow Equalization[1]	185,760
Pumping Operations[1]	83,940
FFD	150,000
Required Storage Capacity	**419,700**

[1] Determined based on flow pattern data and facility information provided by CCU.

Therefore, as shown the reserve storage and operational storage analyses indicated a minimum storage requirement of approximately 0.32 MGD and 0.42 MGD, respectively. With respect to the current Burnt Store Water System finished storage capacity of 1.5 MG, the analysis indicated no finished water storage deficiencies exist under current conditions.

7.4.2.2 Pipeline Capacity Analysis

The current condition hydraulic model for the Burnt Store Water System was used to assess the current system operations and pressures. The purpose was to determine limitations in the current system's ability to distribute water under various current condition demand scenarios, while maintaining the County's LOS as noted in Table 7-3. No deficiencies were found in the current system scenario.

7.4.2.3 Pumping Capacity Analysis

Table 7-10 presents the results of the pumping capacity analysis performed for the Burnt Store RO WTP HSPs. The table shows that the pumps at Burnt Store WTP have a capacity deficit of 128 gpm to meet maximum day demands plus FFD under current conditions when compared to the pump station firm capacity. However, collectively the pump station can

make up the slight deficit in performing slightly above design. No further modifications are needed regarding the current pump station capacity.

Table 7-10 Current Burnt Store Water System Pumping Analysis

Pump Station	Pump Unit	Rated Capacity		Total Pump Station Capacity		Firm Capacity		Service Area Maximum Day Demand[1]	Max. Fire Flow[2]	Surplus / (Deficit)
		gpm	MGD	gpm	MGD	gpm	MGD	gpm	gpm	gpm
Burnt Store RO WTP	1	1,670	2.40	3,270	4.71	1,600	2.30	478	1,250	negligible
	2	500	0.72							
	3	500	0.72							
	4	300	0.43							
	5	300	0.43							

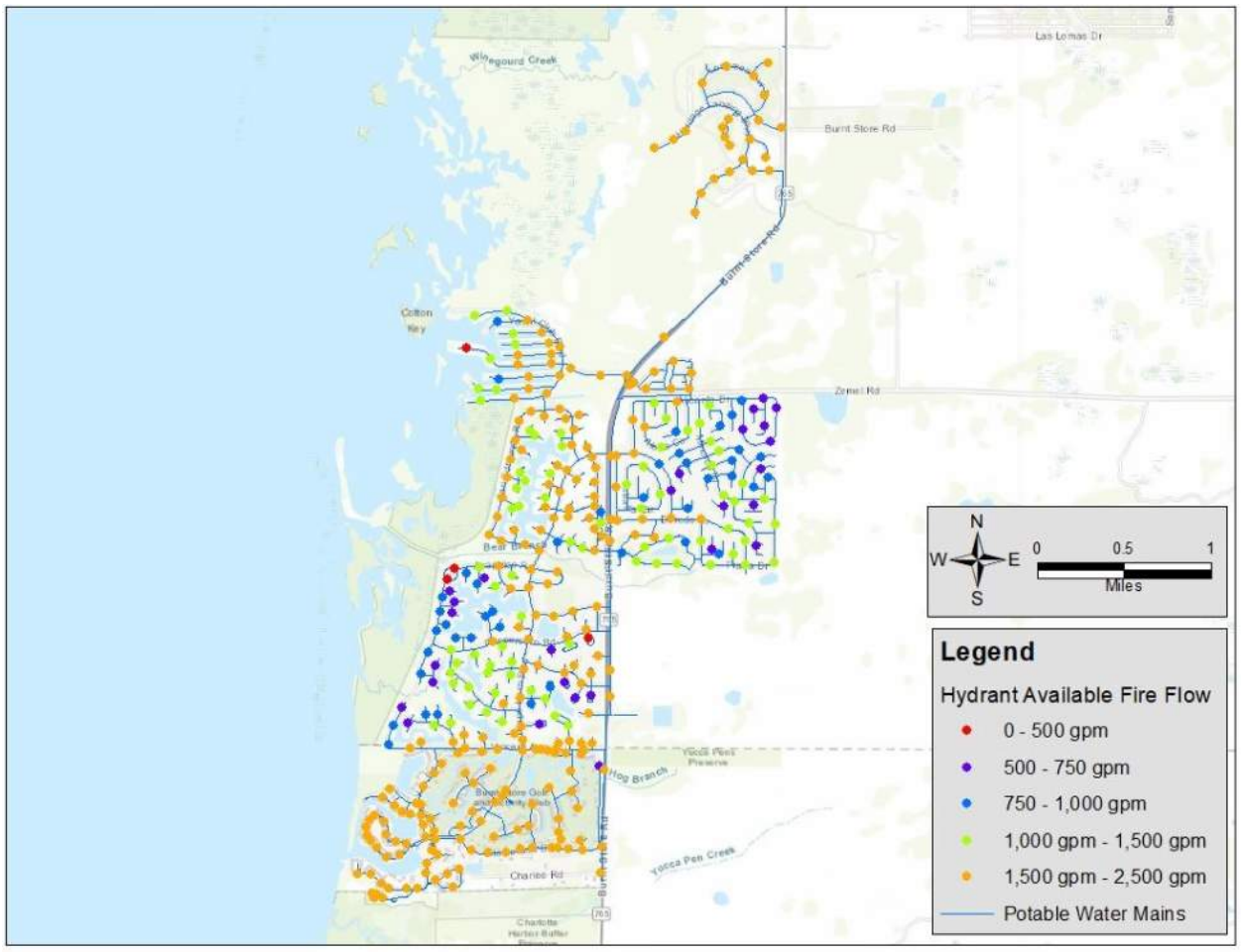
[1] Service area demands were based on the historical 2019 average daily demand and a maximum day factor of 1.6.
[2] Fire flow of 1,250 gpm used for the analysis.

7.4.2.4 Fire Flow Analysis

Using the hydraulic model, the maximum available fire flow at each fire hydrant was calculated while maintaining a residual system pressure of 20 psi. The modeling analysis indicates a lack of fire protection within the distribution system. The GIS data provided by the County indicated that fire hydrant data and fire hydrant main sizing seemed to be improperly/inaccurately represented. GIS model corrections are part of Charlotte County's ongoing Cityworks Implementation project. Therefore, the fire flow modeling analysis as part of this report included a capacity analysis leading up to dedicated fire hydrant mains but did not include analyzing the dedicated hydrant main capacity or the ability of specific hydrants to convey fire flows based on technical specifications.

For the Burnt Store Water System, a fire flow analysis was simulated with a minimum fire protection of 1,000 gpm. The results of this model simulation showed that 71 hydrants could not provide a minimum fire flow of 1,000 gpm at a 20-psi residual pressure during the analysis. The model was then re-simulated for a fire flow of 750 gpm, with approximately 40 percent (32 hydrants) unable to provide the required 750-gpm fire flow. Figure 7-3 presents the results visually. Most of these hydrants were at system dead-ends with no system looping and on smaller-diameter pipes (2 and 4 inches). Again, the model was re-simulated for a fire flow of 500 gpm for the remaining 32 hydrants; it was determined that three hydrants were unable to provide a fire flow of 500 gpm. Similar to the Port Charlotte Water System fire flow analysis, County GIS records may have been incorrectly recorded. The County should field investigate to determine the actual pipe diameter using the protocol provided in Appendix E.

Figure 7-3 Burnt Store Water System Fire Flow Analysis



7.4.2.5 Recommended Improvements

Table 7-11 summarizes the results from the analysis conducted herein to evaluate the capacity and hydraulic performance of the Burnt Store Water System under current demand conditions. Generally, the current Burnt Store Water System evaluation resulted in satisfactory performance with respect to minimum CCU's LOS standards, as specified in Table 7-3. The pumping capacity analysis identified a slight deficiency at the Burnt Store RO WTP HSPS, but it is expected to meet the demand condition. Conversely significant areas of South County were non-satisfactory for meeting fire flow likely due to areas with smaller water mains.

Table 7-11 Current Burnt Store Water System Analysis Summary

System	Storage Capacity	Pipeline Capacity	Pumping Capacity	Fire Flow
Burnt Store	Satisfactory	Satisfactory	Satisfactory	Non-satisfactory

7.5 FUTURE SYSTEM HYDRAULIC ANALYSIS

This section presents the results of the hydraulic modeling analysis under 2045 future flow and infrastructure conditions for each potable water distribution system. For the Port Charlotte Water System, future supply was assumed to be provided by PRMRWSA based on the recommendations in Section 6.7. For the Burnt Store Water System, future supply was assumed to be provided by Burnt Store RO WTP. After determining deficiencies and required infrastructure improvements under 2045 conditions, additional modeling scenarios were used to identify project phasing to meet interim projected water demand conditions as provided in
Chapter 4.

7.5.1 MID/WEST COUNTY – PORT CHARLOTTE WATER SYSTEM

The future AADD and MDD conditions for the Port Charlotte Water System modeling analysis were taken as 29.2 MGD and 37.96 MGD, respectively.

7.5.1.1 STORAGE CAPACITY ANALYSIS

To determine if sufficient finished water storage exists for the future condition Port Charlotte Water System to meet state regulations and maintain optimal performance, a reserve storage capacity and operational storage capacity analysis was conducted as described in Section 7.3. Table 7-12 provides the results of the reserve storage capacity analysis. Table 7-13 provides the results of the operational storage capacity analysis.

Table 7-12 Future Port Charlotte Water System Reserve Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Historical 2019 MDD	37.96 (MGD)
25% MDD	9,490,000
FFD	150,000
Required Storage Capacity	**9,640,000**

Table 7-13 Future Port Charlotte Water System Operational Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Flow Equalization[1]	7,008,000
Pumping Operations[1]	1,789,500
FFD	150,000
Required Storage Capacity	**8,947,500**

[1] Determined based on flow pattern data and facility information as provided by CCU.

Therefore, as shown, the reserve storage and operational storage analyses indicated a minimum storage requirement of 9.64 MGD and 8.95 MGD, respectively. With respect to Section 62-555.320(19), FAC, the analyses indicated no finished water storage deficiencies in the Port Charlotte Water System under future fire storage conditions since the existing storage is 10 MG, which is 0.36 MG above the reserve storage requirement. In addition, this analysis concluded that adequate operational storage exists in the system for the 2045 projected demand scenario.

7.5.1.2 Pipeline Capacity Analysis

The upgrades required to meet pipeline LOS largely depends on CCU's route for increasing flows to West County. As mentioned in Section 6.1, the model was used to assess many routes and determine the most economical option for meeting future water demands. For simplicity only three alternatives were included in this report. The three scenarios modeled to meet future water demand conditions in the Port Charlotte Water System include:

- Alternative A – Use Existing PRMRWSA Interconnects
- Alternative B – Add Mid County Extension and Interconnect
- Alternative C – Add West County Extension and Interconnects

The following sections discuss the minimum pipeline and pumping capacity requirements to maintain LOS goals for each alternative. The alternatives evaluate the capability of the future condition system's ability to maintain CCU's pipeline LOS proposing an increased allocation from PRMRWSA.

Alternative A – Use Existing PRMRWSA Interconnects

Figure 7-4 depicts an overview of Alternative A. This hydraulic modeling scenario was developed with the purpose of meeting future water demands by conveying PRMRWSA water to West County using existing PRMRWSA interconnects and miscellaneous pipeline improvements. For this scenario, no cost-sharing options are assumed available and CCU would be financially responsible for all improvements. Modeling indicates the primary distribution system improvements required to satisfy future conditions under Alternative A as shown below.

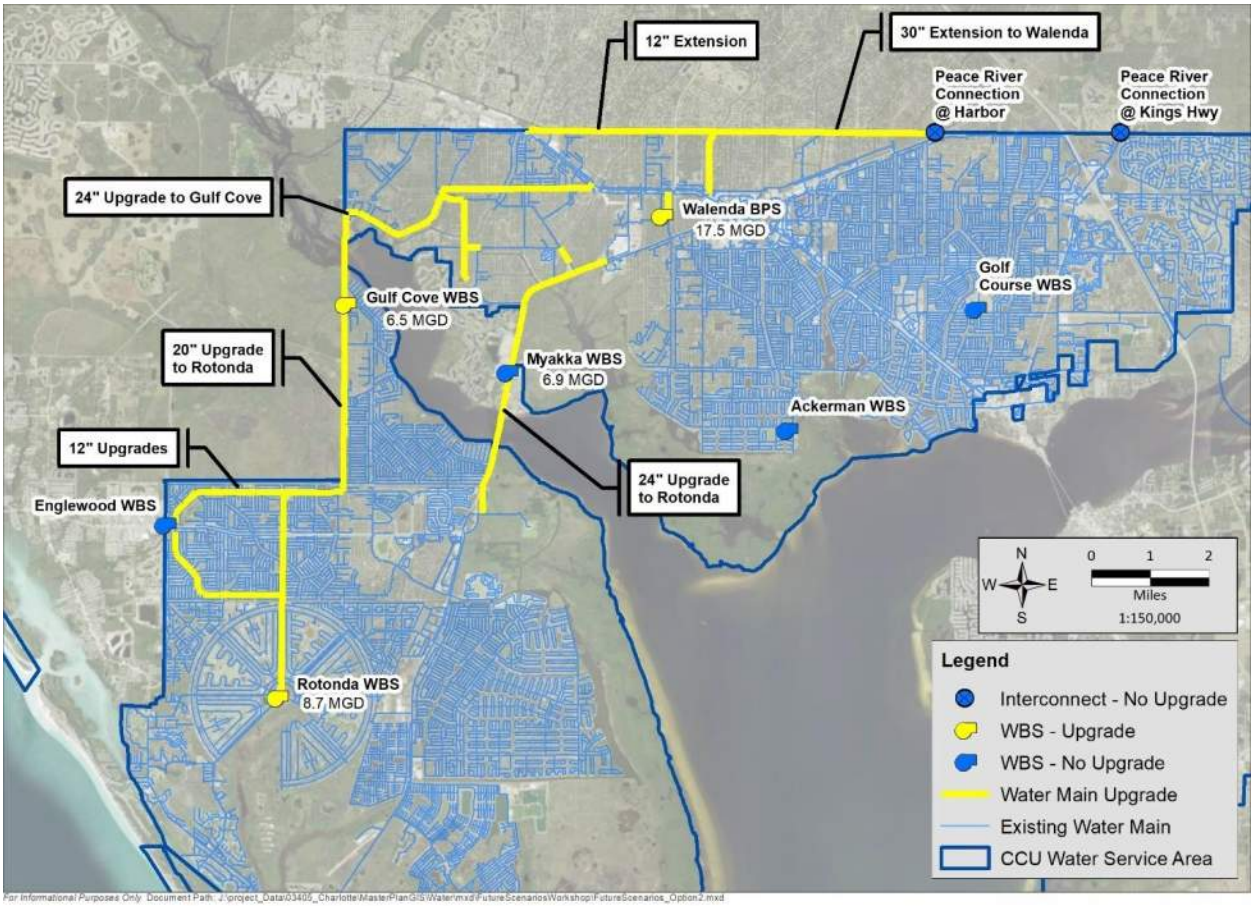
Pipeline Capacity Improvements:

- 30-inch transmission main along Hillsborough Boulevard and Sherbourne Street.
- 12-inch pipeline extension on Hillsborough Boulevard.
- 24-inch pipeline along Sherbourne Street and Como Street from Hillsborough Avenue to the Walenda GST.
- 24-inch pipeline upgrade to Gulf Cove WBS.
- 24-inch transmission main upgrade on SR-776 to Cattledock Point Road.
- 20-inch pipeline addition from Gulf Cove WBS to Rotonda WBS.
- 12-inch pipeline upgrade on Wilmington Boulevard to Englewood WBS.
- 12-inch pipeline upgrade on Gulfstream Boulevard from Englewood WBS.

Pumping Capacity Improvements:

- Walenda WBS upgrade to 17.5 MGD.
- Rotonda WBS upgrade to 8.7 MGD at 80 psi.
- Gulf Cove WBS upgrade to 6.5 MGD at 80 psi.

Figure 7-4 Future Alternative A – Use Existing PRMRWSA Interconnects



ALTERNATIVE B – ADD MID COUNTY EXTENSION AND INTERCONNECT

Figure 7-5 depicts an overview of Alternative B. This hydraulic modeling scenario was developed with the goal of improving PRMRWSA flows to Mid County by cost-sharing a PRMRWSA pipeline including two new PRMRWSA interconnects in Mid County. CCU would then extend a (non-cost-shared) pipeline from Biscayne Drive to Rotonda WBS. Modeling indicates the primary distribution system improvements required to satisfy future conditions under Alternative A as shown below.

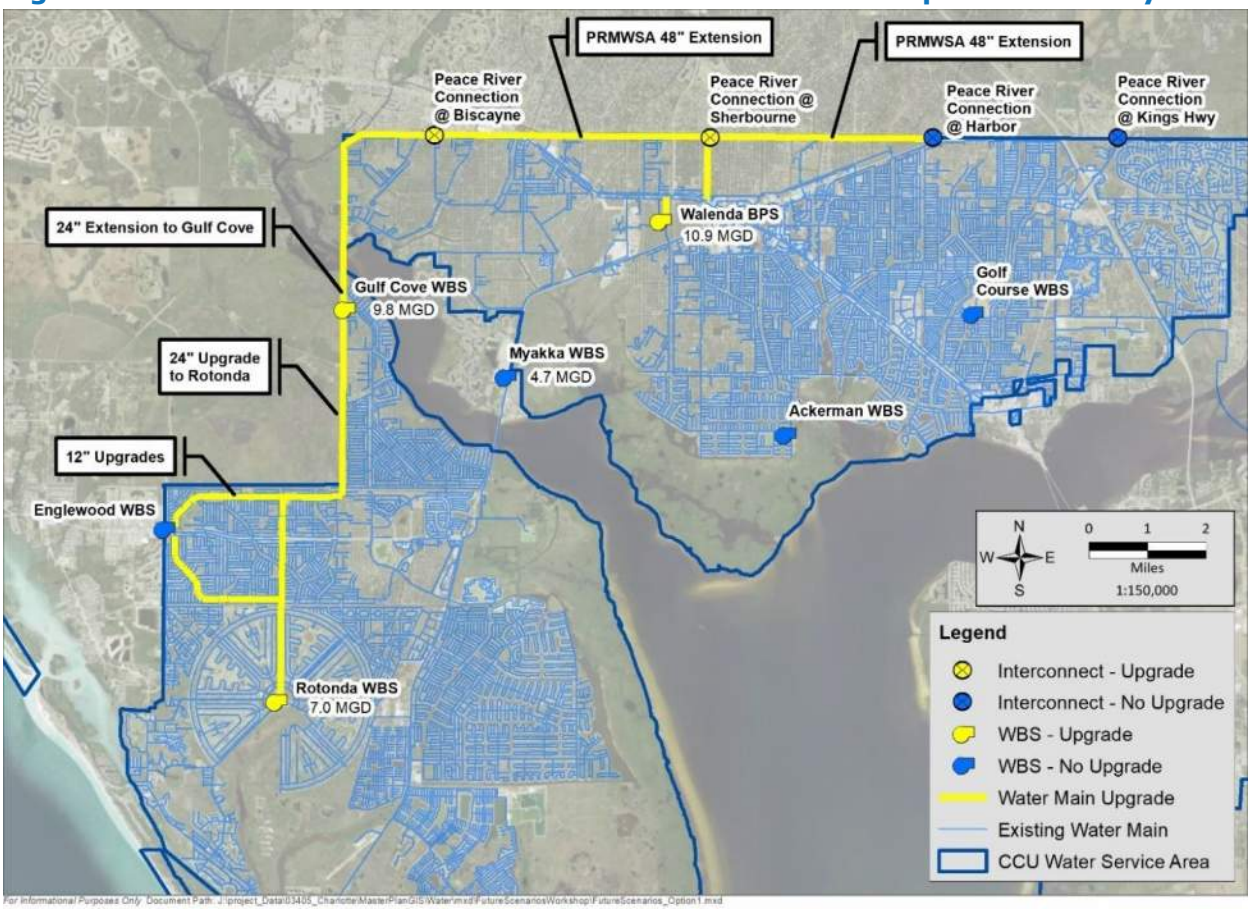
Pipeline Capacity Improvements:

- 48-inch shared-cost PRMRWSA transmission main along Hillsborough Boulevard to Biscayne Drive.
- 24-inch extension of PRMRWSA pipeline on Biscayne Drive to Gulf Cove WBS.
- 24-inch pipeline upgrade from Gulf Cove WBS to the Rotonda WBS.
- 24-inch pipeline along Sherbourne Street and Como Street from Hillsborough to the Walenda GST.
- 12-inch pipeline upgrade on Willmington Boulevard to the Englewood WBS.
- 12-inch pipeline upgrade on Gulfstream Boulevard from the Englewood WBS.

Pumping Capacity Improvements:

- Walenda WBS upgrade to 11.2 MGD.
- Rotonda WBS upgrade to 8.8 MGD @ 80 psi.
- Gulf Cove Upgrade to 13.1 MGD @ 80 psi.

Figure 7-5 Future Alternative B – Cost-Shared PRMRWSA Pipeline to Biscayne



Alternative C – Add West County Extension and Interconnects

Figure 7-6 depicts an overview of Alternative C. This hydraulic modeling scenario was developed with the goal of increasing PRMRWSA flows and conveying additional flow to Mid and West Counties, assuming that PRMRWSA would cost share a large pipeline from the Harbor Boulevard interconnect to Gulf Cove WBS. This recommendation is to construct a 48-inch transmission main along Hillsborough Boulevard and Chancellor Boulevard from the Harbor Boulevard PRMRWSA interconnect west to Campbell Street then south to the Gulf Cove WBS. PRMRWSA would collaborate with CCU for the pipeline expansion to the Gulf Cove WBS. Additional PRMRWSA interconnects would be added at Sherbourne Street, Biscayne Drive, and the Gulf Cove WBS. The primary distribution system improvements required to satisfy future conditions under Alternative C as shown below.

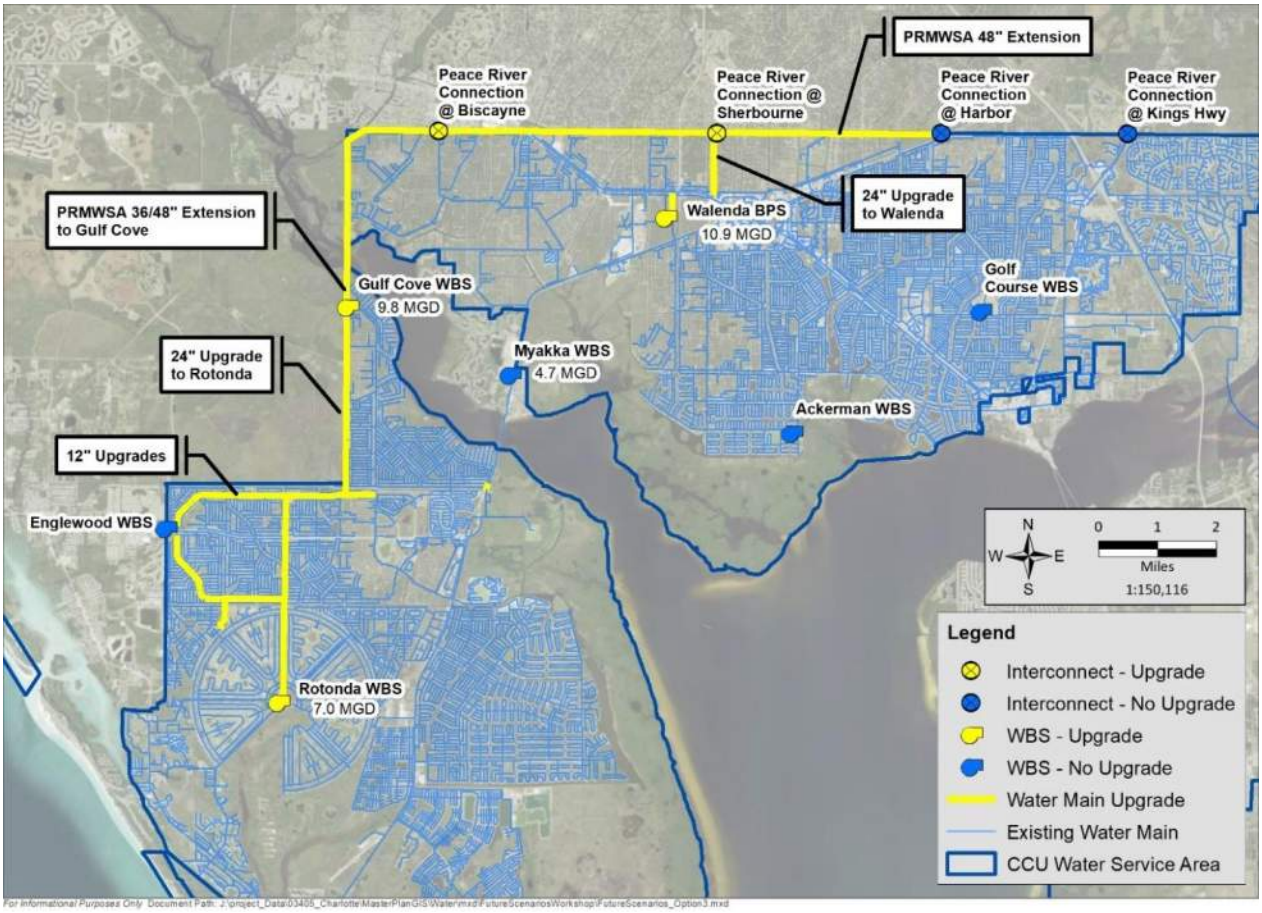
Pipeline Capacity Improvements:

- 48- to 42-inch PRMRWSA pipeline extension along Hillsborough to Gulf Cove WBS.
- 24-inch pipeline along Sherbourne Street and Como Street from Hillsborough to the Walenda GST.
- 12-inch pipeline upgrade on Willmington Boulevard to the Englewood WBS.
- 12-inch pipeline upgrade on Gulfstream Boulevard from the Englewood WBS.

Pumping Capacity Improvements:

- Walenda WBS upgrade to 10.9 MGD.
- Rotonda WBS upgrade to 7.0 MGD.
- Gulf Cove WBS upgrade to 9.8 MGD.

Figure 7-6 Future Alternative C – Cost-Shared PRMRWSA Pipeline to Gulf Cove



Alternatives Summary and Comparison

- *Alternative A* – The primary distribution system improvements required to satisfy future conditions under Alternative A include pipeline installations along Hillsborough Boulevard, El Jobean Road (SR-776) and from US-41 through to Gulf Cove WBS to Rotonda WBS. Pumping improvements include upgrades to Walenda WBS, Rotonda WBS, and Gulf Cove WBS.
- *Alternative B* – The primary distribution system improvements required to satisfy future conditions under Alternative B include installing two new interconnects along Hillsborough Boulevard/Chancellor Boulevard and installing pipelines from the existing PRMRWSA interconnect at Harbor Boulevard along Hillsborough Boulevard, Chancellor Boulevard, Biscayne, Willmington Boulevard, and Sunnybrook Boulevard to the Rotonda WBS. Pumping improvements include upgrades to Walenda WBS, Gulf Cove WBS, and Rotonda WBS; however, pumping capacity requirements are notably lower at Walenda WBS and notably higher at Gulf Cove WBS.
- *Alternative C* – The primary distribution system improvements required to satisfy future conditions under Alternative C include installing three new supply interconnects and a PRMRWSA-cost-shared major pipeline from the Harbor Boulevard interconnect to Gulf Cove WBS, as well as a new mains to feed the Walenda WBS and Rotonda WBS. Pumping improvements are similar to Alternatives A and B; however, fewer capacity upgrades are required due to the conveyance capacity of the proposed 48-inch pipeline upgrade to the Gulf Cove WBS.

Table 7-14 summarizes the advantages and disadvantage of each alternative. The analysis concluded that Alternative C provides the most advantages and is cost-effective compared to Alternatives A and B and is the recommended alternative. Alternative C was further investigated as the primary option. Due to additional evaluation, recommendations for pipeline improvements under Alternative C in Chapter 7 may vary slightly from those in Chapter 9. See Chapter 9 and Appendix F for final CIP recommendations.

7.5.1.3 Pumping Capacity Analysis

The future pumping capacity analysis was applied to the projected 2045 demand condition, assuming future demands were supplied by PRMRWSA, and the 2045 demands were determined to not be met with the current pumping system. The pumping analysis was re-run assuming the infrastructure improvements identified under Alternative C have been implemented. Table 7-15 presents the results for the recommended 2045 future system. As the table shows, the Golf Course WBS experiences a deficit when MDD plus fire flow is applied. The Golf Course WBS service area is near several PRMRWSA interconnects, which would provide additional capacity in the event of a fire. In addition, the Myakka inline WBS, which conveys water from Mid County to West County, is interconnected with Rotonda WBS, Englewood WBS and Gulf Cove WBS. These pump stations work together to service the same demands. During a fire, the pump stations will provide additional capacity to support the Myakka WBS.

Table 7-14 Alternatives Comparison – Advantages and Disadvantages

Alternative	Advantages	Disadvantages
Alternative A	▪ Maintains roadway easement along Hillsborough Boulevard.	▪ Walenda WBS remains critical in distributing demands to West County. ▪ Myakka River bridge crossing pipeline requires upgrades. ▪ Gulf Cove WBS is required. ▪ Assumes available supply. ▪ No shared cost between PRMRWSA and the County.
Alternative B	▪ Minor upgrades required for WBS. ▪ Reduces system dependence on the Walenda WBS. ▪ Redundancy between Rotonda and Gulf Cove WBS. ▪ Shared regional cost for Mid County transmission main. ▪ No change in treatment; manageable regulations.	▪ Shared easement. ▪ Requires upgrading Rotonda WBS. ▪ Requires relatively costly infrastructure. ▪ Assumes available supply.
Alternative C	▪ Minor upgrades. Required for WBSs. ▪ Reduces system dependence on the Walenda WBS. ▪ WBS redundancy between Rotonda and Gulf Cove WBSs. ▪ Shared regional cost for Mid County transmission main. ▪ No change in treatment; manageable regulations.	▪ Shares easement. ▪ Requires relatively costly infrastructure. ▪ Assumes available supply.

Table 7-15 Future Port Charlotte Water System Pumping Analysis

Location	Pump Station	Pump Unit	Rated Capacity		Total Pump Station Capacity		Firm Capacity		Service Area Maximum Day Demand[1]	Maximum Fire Flow[2]	Surplus / (Deficit) (MGD)
			gpm	MGD	gpm	MGD	gpm	MGD	gpm	gpm	gpm
Mid County Pump Stations	Golf Course WBS	1	1,500	2.16	3,000	4.32	1,500	2.16	2,517	1,250	(1,067)
		2	1,500	2.16							
	Ackerman WBS[3]	1	1,200	1.73	2,880	4.15	1,200	1.73			
		2	1,680	2.42							
	Walenda WBS	1	1,514	2.18	7,570	10.90	6,056	8.72	3,358	1,250	1,448
		2	1,514	2.18							
		3	1,514	2.18							
		4	1,514	2.18							
		5	1,514	2.18							
West County Pump Stations	Myakka WBS	1	1,500	2.16	4,500	6.48	3,000	4.32	8,853	1,250	2,642
		2	1,500	2.16							
		3	1,500	2.16							
	Rotonda WBS	1	1,215	1.75	4,860	7.00	3,645	5.25			
		2	1,215	1.75							
		3	1,215	1.75							
		4	1,215	1.75							
	Gulf Cove WBS	1	1,700	2.45	6,800	9.79	5,100	7.34			
		2	1,700	2.45							
		3	1,700	2.45							
		4	1,700	2.45							
	Englewood WBS[4]	1	1,000	1.44	2,000	2.88	1,000	1.44			
		2	1,000	1.44							

[1] Service area demands were obtained from the hydraulic model by performing a trace.
[2] Fire flow of 1,250 gpm used for this analysis.
[3] Ackerman is listed here and was included in the service area supply analysis. The main function of this WBS is to boost chlorine residuals and not supply demands; however, in a fire event the pumping capacity will be used as needed.
[4] Englewood WBS is primarily used to boost pumping capacity in the event of a fire, or as needed.

7.5.1.4 RECOMMENDED IMPROVEMENTS

Through the course of this CCPWMP, CCU staff have reported operational issues in the Port Charlotte Water System. The issues include:

- Issues related to water recirculation near Gulf Cove WBS and Golf Course WBS were identified by CCU staff and reported to Jones Edmunds. From a system operations standpoint, valves are used to control the direction and flowrate of water in a distribution system, particularly near WBSs. Additional modeling efforts did not depict water recirculation in the model. CCU should verify the status of valves (open/closed) local to the WBSs in the field against the County's GIS system.
- In fall 2021, the County reported capacity deficiencies at the Walenda and Rotonda WBSs:
  - The Rotonda WBS 60-hp pumps were not operating as intended. CCU explored upgrading the 60-hp pump impellers, but coordination with Jones Edmunds resulted in a modeling analysis that predicted little to no increase in overall pumping capacity. Further meeting discussions provided that the two 60-hp pumps should be upgraded to 150 hp and coordinated with electrical upgrades to ensure new equipment will adequately support future modifications for four 150-hp pumps. Suction and discharge piping will also likely require modifications. The current system model for this master planning effort included 2019 historical demands. In this demand scenario, the pump capacity issues were not evident during the hydraulic analysis. However, since the County is currently experiencing the operational issues, improvements have been recommended to upgrade the pumping capacity.
  - CCU operational staff reported that the Walenda WBS does not meet total pumping capacity design and that the WBS capacity is maxed out with all five pumps operating at full capacity. Meetings and discussions with CCU engineering staff provided an interim solution to replace the three 75-hp pumps with three 150-hp pumps and coordinate with electrical upgrades to ensure that the electrical equipment will adequately support future modifications for five 150-hp pumps. Suction and discharge piping will also likely require modifications.

Due to the operational issues identified by CCU staff and explained above, near-term improvements were generated and are summarized below. These improvements are required to be online to support the current-day system demands.

In addition, Table 7-16 summarizes the results from the modeling analysis conducted herein to evaluate the capacity and hydraulic performance of the future Port Charlotte Water System. Future demands were assumed to be supplied by additional allocation from PRMRWSA. The modeling results indicated deficiencies in pumping capacity and pipeline hydraulic capacity without the addition of the improvements specified in Alternative C.

Table 7-16 Future Port Charlotte Water System Analysis Summary

Storage Capacity	Pipeline Capacity	Pumping Capacity
Satisfactory	Non-satisfactory	Non-satisfactory

The following section discuss recommendations for the Mid-West County water distribution system improvements based on deficiencies identified while implementing Alternative C, where water distribution system components did not meet minimum LOS requirements.

The timing considerations for the Mid-County potable water system improvements that will occur over a 20-year planning period are driven by the potable water demands identified in Section 4.3. The results of the hydraulic modeling were used to propose timed improvements for the pipeline and pump stations improvements with the distribution system. The improvements are summarized below in the order of near-term to long-term.

NEAR-TERM IMPROVEMENTS:

- Upgrade the Walenda WBS pumping capacity and discharge piping to convey 10.9 MGD. The Walenda WBS is an integral part of the water distribution system and is the main station conveying water to West County. To meet current AADD/PHD flows, it must remain online. Based on conversations with the County, the Walenda WBS has been struggling to supply existing system demands in recent months and larger pumps are required. The future hydraulic modeling indicated that significant pumping capacity upgrades (from 7.5 MGD to 10.9 MGD) are required to satisfy the projected 2045 future-demand conditions. Preliminary modeling scenarios indicate that the existing three 75-HP pumps could be replaced with 150 HP pumps to provide a total pumping capacity of 10 MGD. CCU should proceed with a preliminary design report for the upgrade and determine the hydraulic limitations of the existing effluent piping and electrical upgrades required to meet the future conditions. The second phase of the implementation should occur in planning year 2030. Due to the existing piping configuration at Walenda WBS, these upgrades are likely to incur significant capital costs.

- Upgrade the Rotonda WBS pumping capacity and discharge piping to convey 7.0 MGD @ 80 psi. Rotonda WBS plays an important role in the West County water distribution system and is required to remain online to meet current AADD/PHD flows. The hydraulic modeling indicated that the Rotonda WBS would require significant pumping capacity upgrades from 5.5 MGD to 7.0 MGD to satisfy projected 2045 demand conditions. Due to the existing piping configuration at Rotonda WBS, these upgrades are likely to incur significant capital costs. CCU is aware of the requirements for upgrading and has expressed interest in constructing an additional on-site pump station in lieu of costly, phased construction upgrades to the existing pump station. Therefore, Charlotte County should generate a preliminary engineering report to evaluate the feasibility of a new *sister* WBS to satisfy 2045 water demands. The existing pump station should be upgraded, as necessary, to meet demands through 2030. The recommended report would include a preliminary design for a new on-site pump station and associated engineer's opinion of probable cost.

2030 IMPROVEMENTS:

- Upgrade Gulf Cove WBS to convey 9.8 MGD @ 80 psi with a VFD setpoint of 80 psi. The Gulf Cove WBS would need to be upsized to convey water via the proposed Peace River extension included in Alternative C. The hydraulic modeling conducted for this report indicated that the pumping capacity must be increased from 4.3 to 9.8 MGD and that the pressure can be increased to 80 psi to satisfy the projected 2045 demand conditions under Alternative C. Project implementation should occur before 2027.

- Install approximately 67,060 LF of 48-inch transmission main from Harbor Boulevard to Gulf Cove WBS. CCU's current system is unable to convey water to supply the projected demands in West County. Significant transmission system improvements are required to accomplish water supply transfer from the PRMRWSA interconnects in Mid County to West County including approximately 13 miles of 48-inch transmission mains. Additional interconnects should be installed along this pipeline to increase flow and pressures and to provide resilience and redundancy. At a planning level, most of those interconnects are assumed to be 12-inch-diameter to serve as CCU distribution system connections. Implementation should occur before 2027, when projections exceed allocated capacity from the PRMRWSA interconnections. CCU should work with the PRMRWSA to complete this project as it replaces the original Phase IIB project as discussed in Section 6.2.1.

- Install approximately 7,830 LF of 24-inch water main or equivalent along Sherbourne Street and Como Street from Hillsborough Boulevard to the Walenda GST. This transmission main improvement will distribute more supply to the Walenda WBS to satisfy projected system demands.

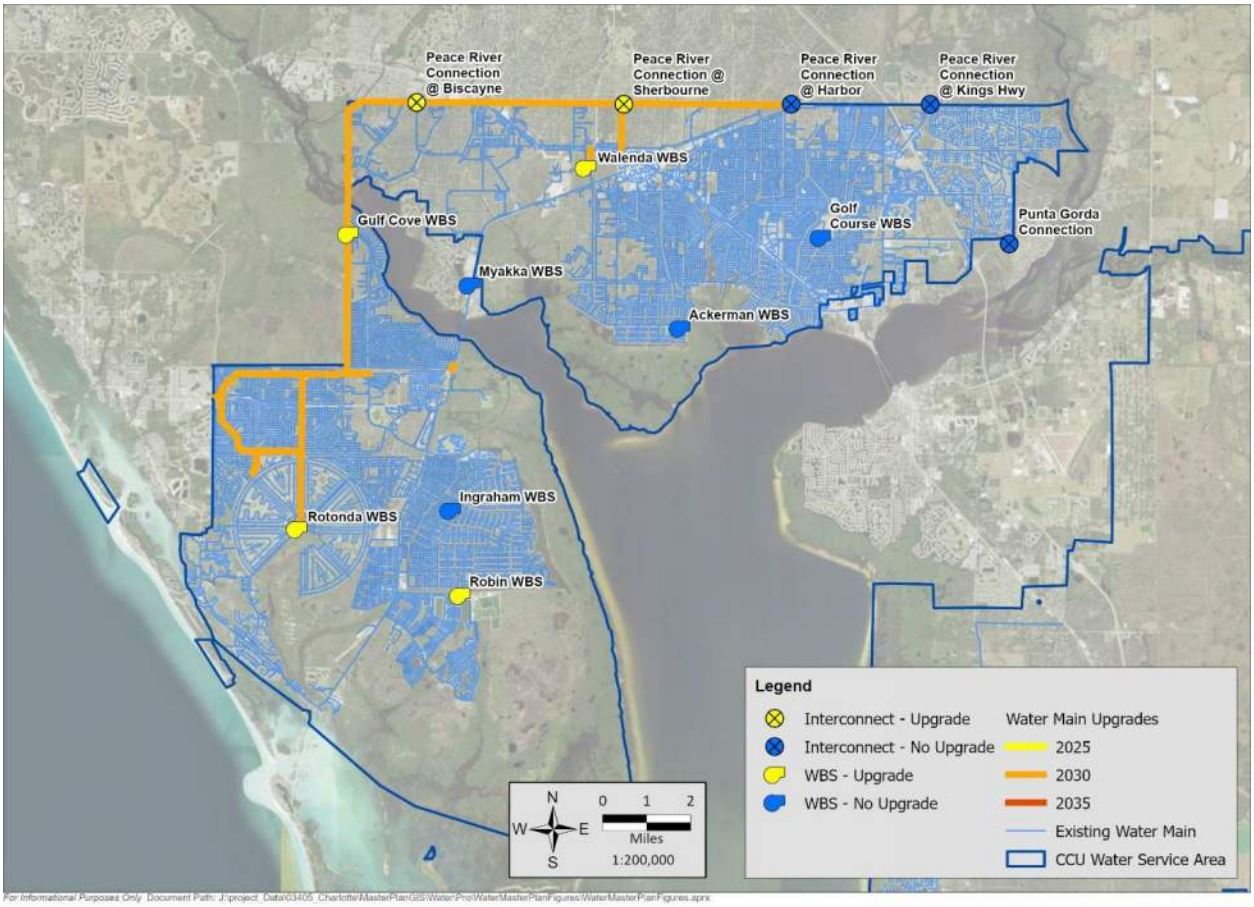
- Install approximately 41,190 LF of 24-inch water main or equivalent from the Gulf Cove WBS to the Rotonda WBS. This transmission main improvement increases water supply to the 5-MG tank at the Rotonda WBS to satisfy projected system demands in West County.

- Replace approximately 12,010 LF of 8-inch to 12-inch water main on Willmington Boulevard to the Englewood WBS. This improvement provides additional capacity to the Englewood WBS for system boosting and re-chlorination to support future 2045 system demands.

- Replace approximately 13,750 LF of 8-inch to 12-inch water main on Gulfstream Boulevard from the Englewood WBS. This improvement increases pumping capacity at the Englewood WBS to satisfy projected system demands in West County.

Figure 7-7 depicts the near-term and future phasing requirements for each Mid and West County improvement based on hydraulic modeling results under medium-growth projections to meet CCU's target LOS (225 gpd/ERC). The actual timing for each improvement should be evaluated on a case-by-case basis to best determine future CIP planning schedules. Final CIP recommendations are included in Chapter 9 and Appendix F.

Figure 7-7 Port Charlotte Water System Improvements



7.5.2 South County – Burnt Water Store System

The future AADD and MDD conditions for the Burnt Store Water System modeling analysis were taken as 3.6 MGD and 5.76 MGD, respectively.

7.5.2.1 Storage Capacity Analysis

To determine if sufficient finished water storage exists for the future Burnt Store Water System to meet state regulations and maintain optimal performance, a reserve storage capacity and operational storage capacity analyses were conducted, comparing 25 percent of the future condition MDD, plus FFD, against the future system finished water storage. Table 7-17 provides the results of the reserve storage capacity analysis. Table 7-18 provides the results of the operational storage capacity analysis.

Table 7-17 Future Burnt Store Water System Operational Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Historical 2019 MDD	5.76 (MGD)
25-Percent MDD	1,440,000
FFD	150,000
Required Storage Capacity	**1,590,000**

Table 7-18 Future Burnt Store Water System Reserve Storage Capacity

Storage Capacity Parameter	Volume (gallons)
Flow Equalization[1]	1,555,200
Pumping Operations[1]	426,300
FFD	150,000
Required Storage Capacity	**2,131,500**

[1] Determined based on flow pattern data and facility information as provided by CCU.

Therefore, as shown, the future reserve storage and operational storage analyses indicated a deficit of finished water storage capacity in the Burnt Store Water System of approximately 0.63 MGD. With respect to the FAC requirements, the analysis indicated approximately 0.63 MGD of finished storage is needed for future operational and fire flow demands.

7.5.2.2 Pumping Capacity Analysis

The future pumping capacity analysis was applied to the projected 2045 demand condition. Table 7-19 presents pumping conditions for the 2045 system and the recommended pumping capacity. Future demands cannot be met with the current pumping system. Pumping capacity at the Burnt Store RO WTP must be increased to 10.08 MGD to meet future MDD plus fire demands. Additionally, pressure boosting in the distribution system will be required and can be accomplished through the proposed Heritage Landing WBS. This WBS should be located near the Tern Bay MLS and is required to have a total pumping capacity of 7.2 MGD.

Table 7-19 Future Burnt Store Water System Pumping Analysis

Pump Station	Pump Unit	Rated Capacity		Total Pump Station Capacity		Firm Capacity		Service Area Maximum Day Demand		Max. Fire Flow[1]	Surplus/ (Deficit)
		gpm	MGD	gpm	MGD	gpm	MGD	gpm		gpm	gpm
Burnt Store RO WTP	1	1,750	2.52	7,000	10.08	5,250	7.56	4,000		1,250	0
	2	1,750	2.52								
	3	1,750	2.52								
	4	1,750	2.52								
	5	1,750	2.52								
Heritage Landing WBS	1	2,500	3.6	5,000	7.2	5,000	7.2	2,970		1,250	780
	2	2,500	3.6								
	3	2,500	3.6								

[1] Fire flow of 1,250 gpm used for this analysis.

7.5.2.3 Pipeline Capacity Analysis

The future-conditions hydraulic model for the Burnt Store Water System was analyzed to determine limitations in the current system's ability to distribute water under various current-condition demand scenarios, while maintaining the County's LOS. Development is projected to occur in the northeast service area, including other areas of the South County area. Modeling scenarios indicated low pressures in this area and require additional boosting as well as transmission main upgrades. During the build-out scenario, the model simulated

high velocities and headloss in the 16-inch water main along Burnt Store Road. Additional transmission mains are required to be installed to distribute flows to the northeast service area and are detailed in the subsequent sections.

7.5.2.4 RECOMMENDED IMPROVEMENTS

Table 7-20 summarizes the results from the modeling analysis conducted herein to evaluate the capacity and hydraulic performance of the future Burnt Store Water System. All potable water to supply future demands are assumed to be treated and originate at the Burnt Store RO WTP. The modeling results indicated deficiencies in storage capacity, pumping capacity, and pipeline hydraulic capacity.

Table 7-20 Future Burnt Store Water System Analysis Summary

System	Storage Capacity	Pumping Capacity	Pipeline Capacity
Burnt Store	Non-satisfactory	Non-satisfactory	Non-satisfactory

South County is currently experiencing rapid growth with a large number of planned developments occurring within the service area. The recently planned developments for South County include Tuckers Grade and other properties on the Burnt Store corridor with planned development petitions submitted as identified in the Charlotte County Burnt Store Roadway Phase 2 – Utility Design project. The following recommendations for the Burnt Store Water System improvements are based on deficiencies identified while supplying projected demands where water distribution system components do not meet minimum LOS requirements. The timing considerations for the Burnt Store Water System improvements are primarily driven by the development occurring over a 20-year planning period. The results of the hydraulic modeling were used to generate the list of improvements and timing considerations presented below.

NEAR TERM IMPROVEMENTS:

Recommendations for Burnt Store Water System improvements were based on deficiencies identified while supplying near-term demands, where water distribution system components did not meet minimum LOS requirements. The timing considerations for the near-term Burnt Store Water System improvements are primarily driven by planned development occurring within the next 1 to 2 years. The results of the hydraulic modeling were used to generate the list of improvements as follows:

- Install a new WBS (7.2-MGD at 85 psi) with a 1.2-MG GST near Heritage Landing. This improvement is required to increase pressures in the Heritage Landing development where low-pressure complaints have occurred as well as to boost pressures to future near-term developments during MDD plus fire and peak system demands in the northeast service area. The Heritage Landing WBS is also required to fill the recommended elevated storage tank that is proposed near Tuckers Grade and I-75.
- Install a 1.0- to 1.5-MGD elevated storage tank in the northeast service area near Tuckers Grade and I-75. The elevated storage tank is required to support fire flow requirements as well as peak demands in the northeast section of the service area.

- Install approximately 14,000 linear feet (LF) of 16-inch main through Tuckers Grade and along I-75. This pipeline improvement is required to support future projected demands in the area and to fill the proposed elevated storage tank.

2025 Improvements:

- Install approximately 13,120 LF of 12-inch distribution mains parallel to Burnt Store Road. This water main is required to expand the water distribution system and to distribute water to future developments. This proposed water main will be routed through the Simple Life and Starling developments with a connection along Notre Dame Boulevard to provide additional distribution capacity to transverse water supply to the northeast service area.

- Install approximately 5,200 LF of 16-inch pipeline along Shotgun Road and Los Lomas Drive. This water main is required to expand the water distribution system to provide additional routes to distribute water to the northeast service area.

2030 Improvements:

- Install new high-service pumping at the Burnt Store RO WTP to meet projected MDD plus FFD. The pump station should have a total pumping capacity of 10.08 MGD to meet projected demands with the largest pump out of service. Similar to current operation, the pressure setpoint would be 55 psi to prevent water loss in the infrastructure.

- Install approximately 11,400 LF of 16-inch pipeline along Las Lomas Drive. This water main is required to expand the water distribution system to provide additional infrastructure to distribute water to the northeast service area.

- Install approximately 2,750 LF of 16-inch parallel pipeline to Burnt Store Road connecting Shotgun Road and Las Lomas Drive. This water main is required to expand the water distribution system to provide additional routes to distribute water to the northeast service area.

- Install approximately 10,900 LF of 12-inch pipeline along Jones Loop Road. This water main is required to expand the water distribution system to provide additional infrastructure to distribute water to the northeast service area.

2035 Improvements:

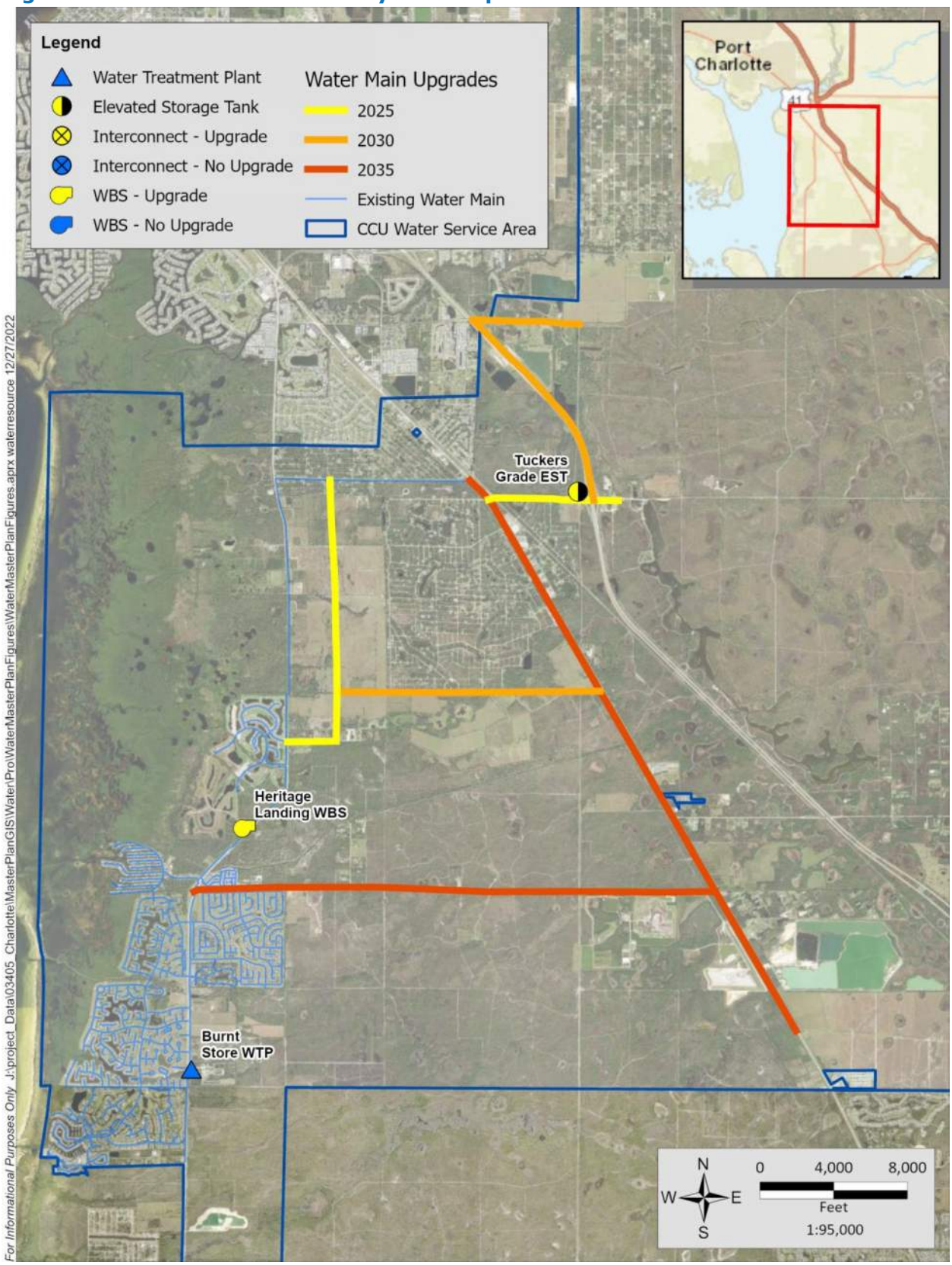
- Install approximately 20,600 LF of 16-inch pipeline along Zemel Road. This water main is required to expand the water distribution system to provide additional infrastructure to distribute water to the northeast service area.

- Install approximately 26,170 LF of 16-inch pipeline along Tamiami Trail. This water main is required to expand the water distribution system to provide additional infrastructure to distribute water to the northeast service area.

Figure 7-8 depicts the near-term and future phasing requirements for each improvement, based on hydraulic modeling results under medium-growth projections to meet CCU's target LOS (225 gpd/ERC). The actual timing for each improvement should be evaluated on a

case-by-case basis to best determine future CIP planning schedules. Final CIP recommendations are included in Chapter 9 and Appendix F.

Figure 7-8 Burnt Store Water System Improvements



8. DISTRIBUTION SYSTEM WATER QUALITY

OVERVIEW

Water quality sampling, monitoring, and reporting are required for all PWSs in accordance with various EPA and FDEP rules. Ensuring the water quality in the distribution system is key to preserving public health and providing a quality product. Water age and extended resident time in the distribution system are often tied to deteriorating water quality due to corrosion, chemical reactions, and decreased free chlorine concentration.

This chapter reviews the water-quality monitoring and reporting regulations for the Port Charlotte and Burnt Store Water Systems as required by FDEP. Historical water quality for each water distribution system was summarized to confirm drinking water standards are within compliance and analyzed for trending purposes. Water-quality data were used to develop the Port Charlotte Water System water age and quality model, which was used to identify CIP projects that could improve flushing and water quality in the distribution system.

8.1 Regulatory Overview and Responsibilities

All PWSs in Florida must adhere to water treatment and quality standards set forth by EPA and FDEP. EPA rules applicable to PWSs include the *Groundwater Rule, Surface Water Treatment Rules, Chemical Contaminant Rules, Radionuclides Rule, Total Coliform Rule, Revised Total Coliform Rule, Lead and Copper Rule*, and the *Stage 1 and 2 Disinfectant/ Disinfection Byproducts Rule*. To ensure water-quality standards are met, PWSs are required to sample at various locations including the source water, entry point to the distribution system, and throughout the distribution systems. The water-quality standards and monitoring requirements for Florida PWSs are primarily discussed in Rules 62-550.300 through 62-550.335, FAC, and Rules 62-550.510 through 62-550.540, FAC. The treatment, sampling, monitoring, and reporting requirements for PWSs are complex and can have significant impacts on operating expenses and workload allocation.

Source water monitoring, sampling, and reporting requirements vary based on the supply type (e.g., surface water, groundwater), which also impacts the treatment process and monitoring requirements during treatment. The entry point or point of entry (POE) to the distribution system is the point where treated water flows from the WTP into the distribution system. Entry-point chemical sampling is performed for drinking water constituents that are not expected to change significantly after the treatment process. These chemicals include:

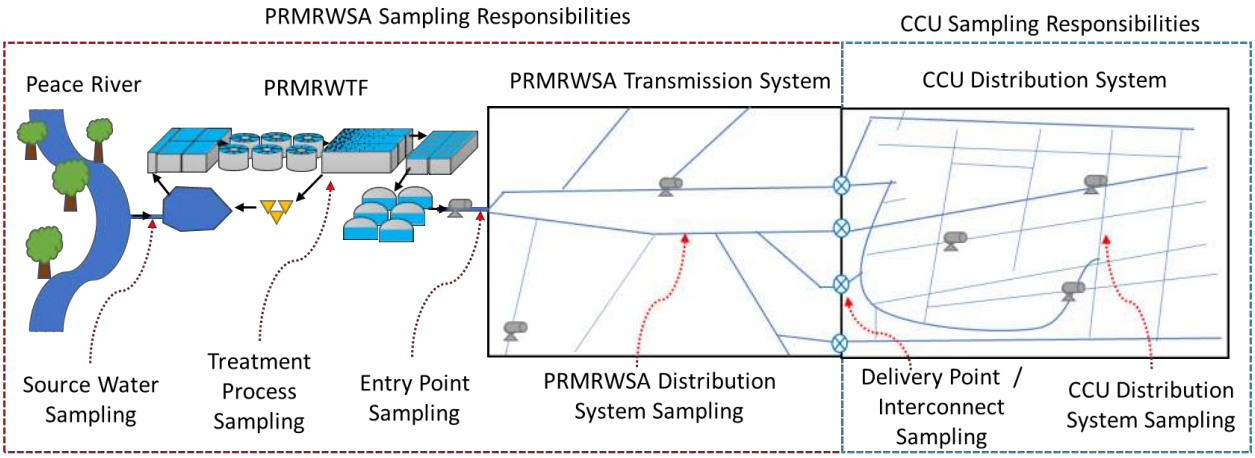
- Inorganic chemicals.
- Synthetic organic chemicals (SOCs).
- Volatile organic chemicals (VOCs).
- Radioactive chemicals.

Distribution system sampling, monitoring, and reporting requirements are also required by each PWS, and the frequency and number of sample sites are determined based on the source water, treatment process, and population served by the PWS. Distribution system monitoring must be conducted for the following:

- Disinfectant Residual
- Microbiological/Bacteriological
- Disinfectant and Disinfection Byproducts (DBPs)
- Lead and Copper
- Water Quality Parameters

Consecutive systems that only purchase or are supplied water from a wholesale provider are not typically required to perform entry point chemical sampling since the wholesaler is already performing the analysis and the amount of a constituent in the wholesaler's water is the same level when it is delivered to the supplied-water system. Consequently, CCU is not responsible for source water or entry point sampling in the Port Charlotte Water System since it is a consecutive system. However, CCU frequently monitors water quality at the PRMRWSA delivery points (i.e., the PRMRWSA-CCU interconnects), and both entities conduct sampling within their respective distribution systems and service areas. Figure 8-1 illustrates the sampling responsibilities for CCU's consecutive PWS.

Figure 8-1 Consecutive PWS Sampling Responsibilities



To comply with FDEP regulations, PWSs must develop and maintain monitoring schedules and sampling plans for chemical, disinfectant residual, microbiological/bacteriological, disinfectant and DBPs, lead and copper, and water-quality parameters. The monitoring sampling plans identify the sites and frequency for each parameter, which are collected periodically based on each individual plan requirements and reported to FDEP for compliance purposes. Plans are developed considering system-specific properties such as water demand, water pressure, water age, pipe material, pipe network, building age, and other infrastructure and hydraulic considerations.

The following section summarizes the current monitoring schedules and sampling plans for the Port Charlotte Water System and the Burnt Store Water System and identifies when the plans will require modification based on population-served thresholds. In addition, Jones

Edmunds also summarized and reviewed water quality data to assess compliance with water-quality standards and identify areas for water-quality improvements.

8.2 Water Quality Monitoring and Compliance Review

8.2.1 Chemical Monitoring

SOCs, VOCs, and radioactive and other inorganic chemicals listed in the primary and secondary drinking water standards must be sampled, monitored, and reported for compliance purposes. As mentioned previously, these parameters are typically monitored in the raw water and primarily collected at the POE. Since CCU owns and operates the Burnt Store WTP, CCU is responsible for the source water and entry point sampling for the Burnt Store PWS. Conversely, PRMRWSA is responsible for monitoring and sampling for these contaminants in the Port Charlotte Water System since it is the bulk water supplier of the consecutive system.

CCU reports the radiological contaminants, inorganic contaminants, SOCs including pesticides and herbicides, and VOCs sampling results in their *Annual Drinking Water Quality Reports* for the Port Charlotte and Burnt Store Water Systems. Water quality results are reported for constituents that were detected in the samples and represent the highest average at any of the sampling points or the highest detected level at any sampling point, depending on the sampling frequency. CCU's available *Annual Drinking Water Quality Reports* were reviewed and show no maximum contaminant level (MCL) violations were reported for these parameters from 2018 to 2021.

8.2.2 Disinfectant Residuals and Bacteriological Monitoring

Disinfectant residuals are constantly monitored and reported by PWSs at various locations for compliance with the *Total Coliform Rule*. The primary purpose of disinfecting and maintaining disinfectant residuals throughout the distribution system is to prevent bacteriological growth, which if consumed, can have adverse and acute human health impacts; however, PWSs must also meet an upper disinfectant residual limit. FDEP rules specify that the lowest residual disinfectant concentration taken from a remote point in the distribution systems must be collected to verify that minimum residuals are met, and the residual disinfectant must also be taken before the first customer during peak flow to ensure the MCL goals (MCLGs) are not frequently exceeded. CCU collects these values daily, reports them on MORs and submits them to FDEP for the Port Charlotte and Burnt Store Water Systems.

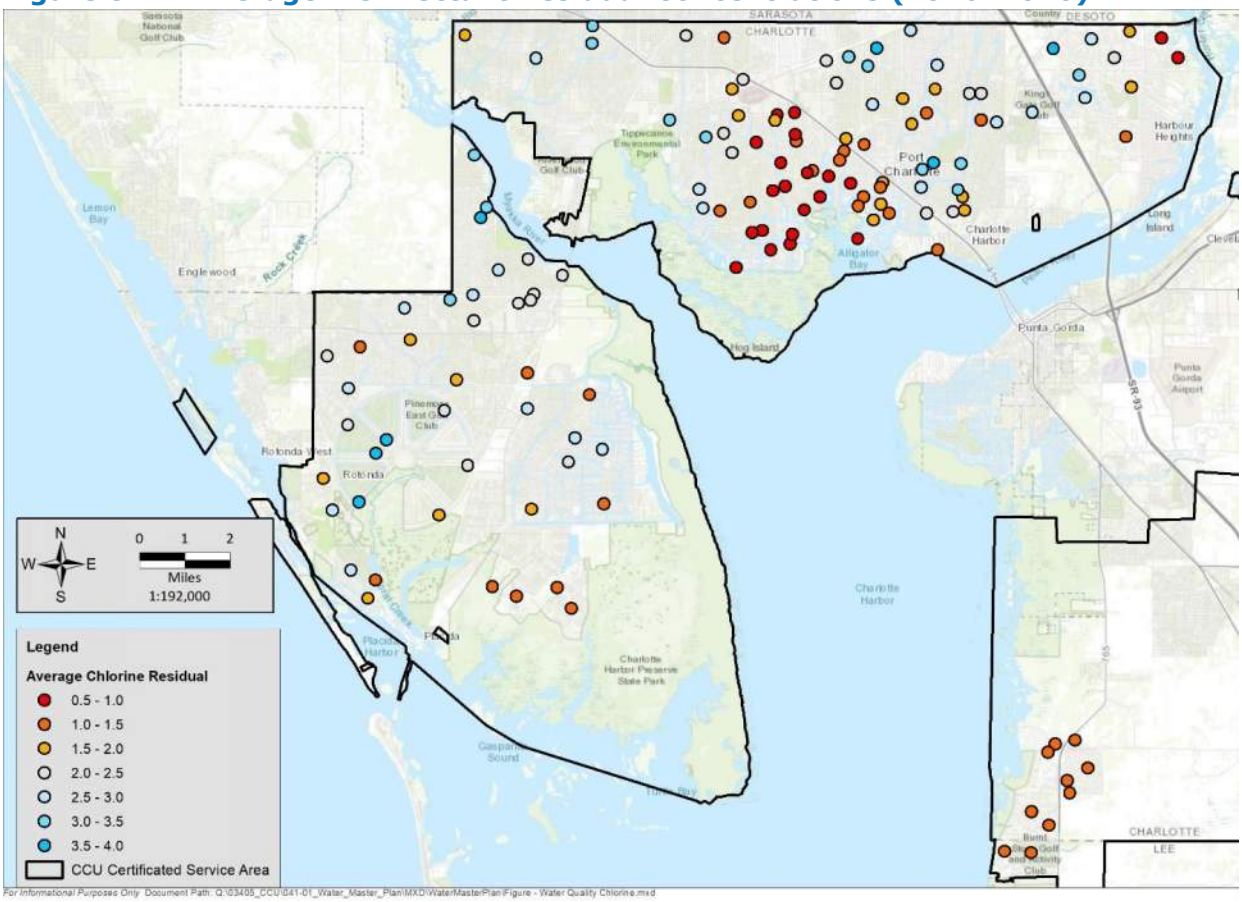
The minimum disinfectant residual concentration is an economical method for monitoring the system since it also serves an indicator of bacteriological growth. Bacteriological samples are more complex and time consuming to analyze but are still required to ensure safe water supplies. CCU collects samples from the Burnt Store groundwater wells and distribution system each month for bacteriological monitoring. The number of samples required for monitoring the distribution system is based on population served per Rule 62-550.518, FAC. Based on the current population estimates, CCU is required to take 120 samples for the Port Charlotte Water System and nine samples for the Burnt Store Water System each month. Once population exceeds 220,000 in the Port Charlotte Water System or 8,500 in the Burnt Store Water System, sampling will need to increase to

150 and 10 samples per month, respectively. At this time, CCU should update their bacteriological monitoring plan as required under the *Total Coliform Rule*.

Based on discussions with CCU staff, no bacteriological exceedances were reported in routine sampling events, and MORs for the Port Charlotte and Burnt Store Water Systems from 2016 to 2020 show that the systems have consistently reported disinfectant residual concentrations above the FDEP standards of 0.6 and 0.2 mg/L, respectively. The minimum residual concentration requirements for the systems are different because the Port Charlotte Water System uses chloramine and the Burnt Store Water System currently uses chlorine, which have different requirements for meeting secondary disinfection and maintaining residuals.

Chlorine residual data can be used not only for compliance but also for analyzing the distribution system and improving operations. Figure 8-2 depicts the average disinfectant residual concentrations throughout the CCU service areas based on field data collected from 2016 to 2020. This figure shows significant degradation of chlorine occurs in the Port Charlotte Water System, but that the Burnt Store Water System is mostly stable. Chapter 3 discusses that disinfectant concentrations are boosted to 4.0 mg/L at each WBS and to 1.5 mg/L at the Burnt Store WTP POE.

Figure 8-2 Average Disinfectant Residual Concentrations (2016–2020)

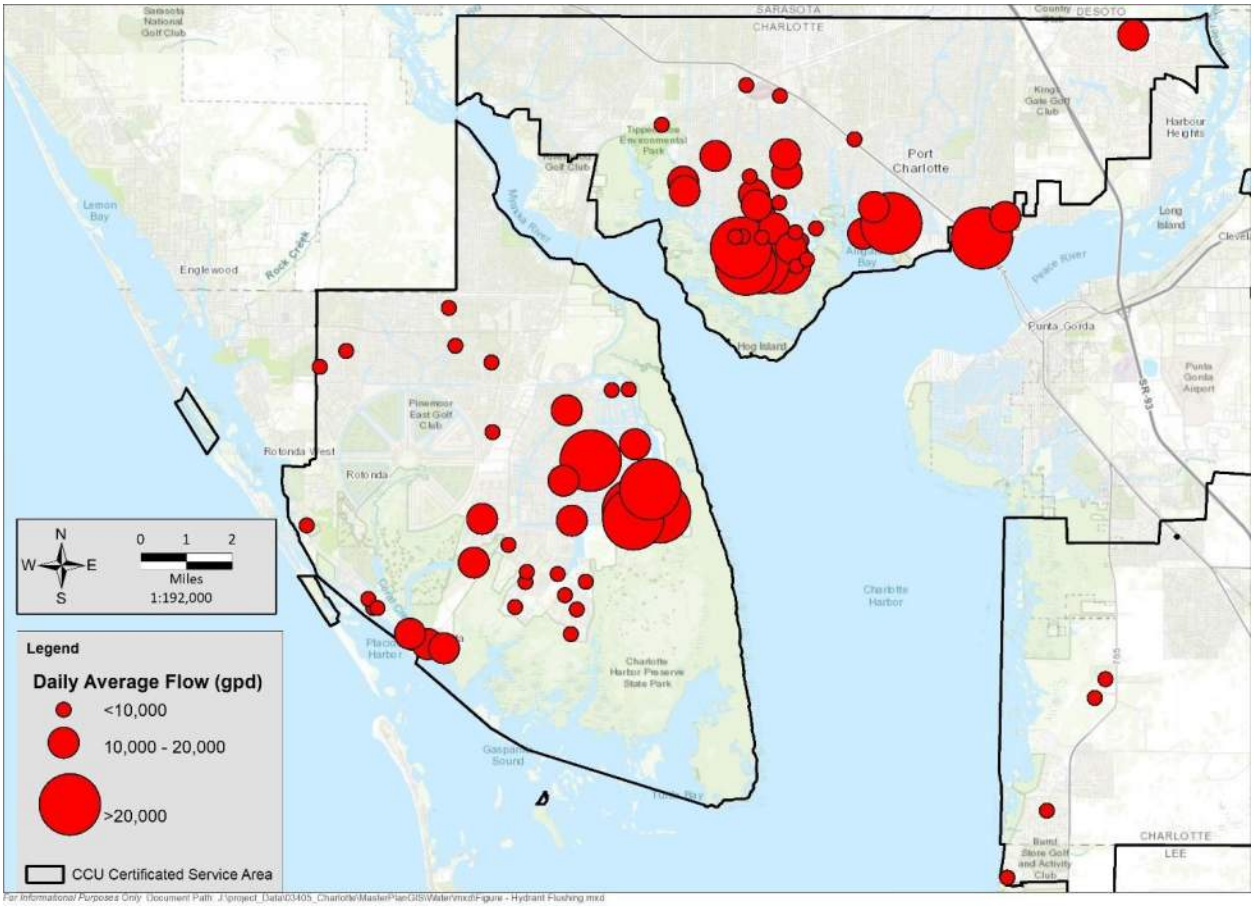


Chlorine residuals are expected to degrade as water travels farther from the chemical-dosing locations, which are often at interconnects, WBSs, and WTPs. Chlorine residuals will naturally decrease over time, but the occurrence worsens where water demand is low and

water temperatures are high. Occasionally, disinfectant residuals will fall below the minimum standards, in which case CCU must perform hydrant flushing to freshen the water supply until disinfectant concentrations meet acceptable levels. Ironically, the occurrence worsens as residents practice water conservation techniques, which reduces water demand and thus may require the utility to increase flushing.

Figure 8-3 depicts the average daily water quantities for CCU's hydrant and auto-flushing locations. The figure indicates that significant flushing is performed and required to maintain minimum chlorine residuals. Since hydrant flushing is contrary to water conservation and increases CCU's non-revenue water, CCU should determine alternative methods for maintaining disinfection residuals.

Figure 8-3 Average Daily Hydrant Flushing Quantities (2017–2021)



Based on Figure 8-2 and Figure 8-3, CCU should investigate options for improving chlorine residuals in areas that have historically low (less than 1.0 mg/L) disinfectant concentrations and high (greater than 10,000 gpd) flushing quantities. These areas include:

- The Deep Creek Area in northwest Mid County.
- The Ackerman area south of Murdock Circle in Mid County.
- The area near Port Charlotte Beach Park in Mid County.
- The shopping center (Schoolhouse Square) near Kings Highway and Harborview Road in Mid County.
- The South Gulf Cove area east of Rotonda Circle in West County.

- The Meadows and Villas areas southeast of Rotonda Circle in West County.
- The neighborhood east of South Gulf Cove Park in West County.
- The area near Placida Park in West County.

Section 8.5 further discusses the water-quality improvement options and recommendations for these areas.

8.2.3 Disinfectant and Disinfection Byproduct Monitoring

As mentioned previously, disinfectants (primarily chlorine and monochloramine) are used in the treatment process to inactivate pathogens and prevent acute illness. However, the disinfectants can also react with natural organic matter present in the water to form DBPs. Generally, the DBP concentrations increase with higher water temperature and greater organics and disinfectant concentrations. Humans exposed to DBPs in excessive amounts could experience liver damage and have an increased risk of some cancers according to the Centers for Disease Control (CDC). The currently regulated DBPs include Trihalomethanes (THMs) and Haloacetic Acids (HAAs). Five primary HAAs are of concern to public health; for this reason, HAAs are interchangeably referred to as HAA_5. The requirements for DBP monitoring and sampling for Stage 1 and Stage 2 DBP compliance are specified in 40 Code of Federal Regulations (CFR) 141 under Subpart L – *Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors* and Subpart V – *Stage 2 Disinfection Byproducts Requirements (DBPR)*. PWSs that consistently violate DBP standards typically must enhance their treatment process or switch to monochloramine as a secondary disinfectant.

CCU conducts routine monitoring for both systems but is only responsible for the Stage 2 compliance on the Port Charlotte Water System. Table 8-1 summarizes the number of sampling sites and frequency for each system, which depends on the source water type, population size, and number of treatment plants or wells. Currently, CCU is required to take 33 samples per year for Total THM (TTHM) and HAA_5 analysis. Once the population reaches 250,000 in the Peace River PWS, four additional samples will be required. Once population reaches 10,000 in the Burnt Store PWS, two additional locations and quarterly monitoring frequency will be required. When approaching a new sampling threshold, CCU should update their Stage 1 and Stage 2 DBPR Compliance Monitoring Plans.

Table 8-1 DBP Routine Monitoring Requirements

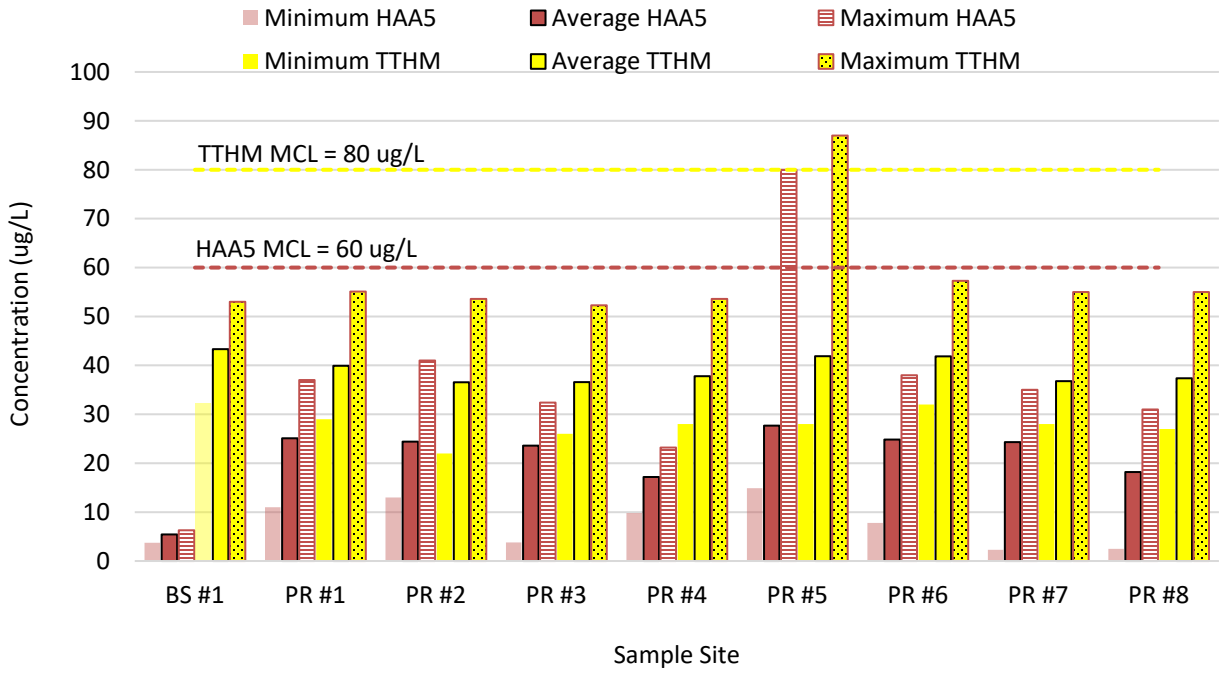
System	Source Water Type	Population Size Category	Monitoring Frequency	Stage 1	Stage 2
Peace River	Subpart H	50,000 to 249,999	Quarterly	4[a]	8
Burnt Store	Groundwater	500 to 9,999	Annually	1	1[b]

[a] Analysis is the responsibility of the PRMRWSA since Stage 1 requires samples be taken at the WTP and the entry point to the distribution system.
[b] Historically, the Burnt Store PWS had two sampling sites and conducted quarterly samples. In 2015, approval was given to reduce monitoring to one site sampled annually for routine monitoring compliance since previous samples were consistency low.

Figure 8-4 displays the minimum, average, and maximum THM and HAA_5 results reported from 2016 to 2020 for each compliance sampling location in the Burnt Store and Port

Charlotte Water Systems. Most of the data show that DBPs are below their MCLs. The only recorded DBP exceedances during this time occurred in 2019 at the PR#5 sampling site. CCU staff investigated the occurrence and found it to be related to a time when a neighboring utility was providing water to the Port Charlotte Water System.

Figure 8-4 CCU DBP Distribution System Monitoring Results 2016–2020



Although the formation potential of THMs and HAAs are typically higher in systems that use chlorine rather than chloramine, Figure 8-4 shows that TTHMs are consistent throughout both distribution systems with an average of approximately 39 micrograms per liter (µg/L) and that HAAs are lower in the Burnt Store Water System. This unexpected trend is likely due to the difference in water sources and treatment processes for each PWS. The high-quality treatment process used at the Burnt Store WTP is very effective at removing organic contaminants that react with chlorine and produce DBPs. These data indicate that CCU does not currently need to switch to monochloramine disinfection for DBP compliance in the Burnt Store Water System, although other factors such as increasing water supply resilience may support changing the disinfectant in the future.

8.2.4 Lead and Copper Monitoring

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Therefore, PWSs must sample their water for lead and copper in accordance with the *Inorganics Monitoring Rule* (Rule 62-550.513, FAC) and the *Lead and Copper Rule (LCR)* (40 CFR 141.80 through 141.91 and Rule 62-550.800, FAC). The number of sample sites required for monitoring the distribution system is tiered and based on population served per Rule 62-550.518, FAC. If a system has historically met standards and sampling results show the water is stable, the sampling requirements may be reduced.

CCU's PWSs meet these requirements and therefore are required to take a minimum of 50 samples for the Port Charlotte Water System and 20 samples for the Burnt Store Water System each compliance period. Currently, CCU takes 56 samples for the Port Charlotte Water System and 25 samples for the Burnt Store Water System per compliance period. The Port Charlotte Water System has reached the highest tier category, but once population exceeds 10,000 in the Burnt Store Water System, sampling will need to increase to 30 samples. Table 8-2 and Table 8-3 summarize the lead and copper values from the highest sampling locations over the previous three compliance periods (i.e., since 2014) for the Port Charlotte and Burnt Store Water Systems, respectively. Sample results indicate that the Port Charlotte and Burnt Store Water Systems have only had one sample exceed the action level for lead and copper concentrations in the last three compliance periods.

Table 8-2 Port Charlotte Water System Lead and Copper Sampling Results (2014–2020)

Parameter	Sample Collection Date	Results	EPA Action Level (AL)[1]	EPA MCLG[2]
Lead	06/03/14-06/05/14	0.00067 U	0.015 mg/L	0 mg/L
Copper	06/03/14-06/05/14	0.062	1.3 mg/L	1.3 mg/L
Lead	06/20/17-06/28/17	0.006	0.015 mg/L	0 mg/L
Copper	06/20/17-06/28/17	1.2	1.3 mg/L	1.3 mg/L
Lead	07/15/20-07/22/20	0.034	0.015 mg/L	0 mg/L
Copper	07/15/20-07/22/20	1.1	1.3 mg/L	1.3 mg/L

Notes: U=Analyte not detected at the value indicated but represents the method detection limit; I=Value is between the laboratory MDL and Practical Quantification Limit.

[1] AL is the concentration of a contaminant, which if exceeded triggers treatment of other requirements for the PWS.
[2] MCLG is the level of a contaminant in drinking water below which there is no known or expected health risk.

Table 8-3 Burnt Store Water System Lead and Copper Sampling Results (2014–2020)

Parameter	Sample Collection Date	Results	EPA AL[1]	EPA MCLG[2]
Lead	06/03/14-06/05/14	0.00067 U	0.015 mg/L	0 mg/L
Copper	06/03/14-06/05/14	0.004	1.3 mg/L	1.3 mg/L
Lead	06/6/17-06/28/17	0.001 I	0.015 mg/L	0 mg/L
Copper	06/6/17-06/28/17	0.052	1.3 mg/L	1.3 mg/L
Lead	06/8/20-06/9/20	0.067	0.015 mg/L	0 mg/L
Copper	06/8/20-06/9/20	0.079	1.3 mg/L	1.3 mg/L

[1] AL is the concentration of a contaminant, which if exceeded triggers treatment of other requirements for the PWS.
[2] MCLG is the level of a contaminant in drinking water below which there is no known or expected health risk.

EPA is revising the LCR, which may impact CCU's monitoring practices and responsibilities for compliance. The revisions include developing an inventory for all lead service lines and changes to the testing and response to the presence of lead in a public water system. CCU could be required to identify public lead service line locations and replace them. Additionally, testing lead levels in schools and childcare facilities would be required for the first time. CCU should begin to integrate the lead service line inventory into the existing *Utility Mapbook,* continue to monitor the updates to the Rule, and adjust their procedures as necessary to comply with the revised LCR.

8.2.5 Water Quality Parameters

PWSs must also monitor various water quality parameters for compliance with the *Inorganic Monitoring Rule* and LCR. The water quality parameters include pH, temperature, conductivity, and calcium. These parameters are primarily measured as indicators of the stability of the system. CCU must collect samples at each supply interconnect and in the distribution systems. The number of sample sites required for monitoring the distribution system is tiered like the LCR requirements. CCU is required to take a minimum of 25 samples for the Port Charlotte Water System and three samples for the Burnt Store Water System each compliance period. Currently, CCU takes 25 samples for the Port Charlotte Water System and 4 samples for the Burnt Store Water System per compliance period. The Port Charlotte Water System has reached the highest tier category, but once the population exceeds 10,000 in the Burnt Store Water System, sampling will need to increase to seven samples.

Figure 8-5 and Figure 8-6 show the statistical distribution of the sampling parameters from 2016 to 2020 for the Port Charlotte and Burnt Store Water Systems. The Port Charlotte Water System contains five entry points corresponding to interconnects with CCU and 25 sampling points within the distribution system. The Burnt Store Water System contains one entry point at the Burnt Store WTP and three sampling points within the distribution system. Water quality with respect to the sampling parameters does not change significantly from the entry points throughout the distribution systems. The maximum, minimum, and average values are similar throughout except for conductivity.

Figure 8-5 Water Quality Parameter Sampling Results for Alkalinity, Calcium, and Conductivity from 2016–2020

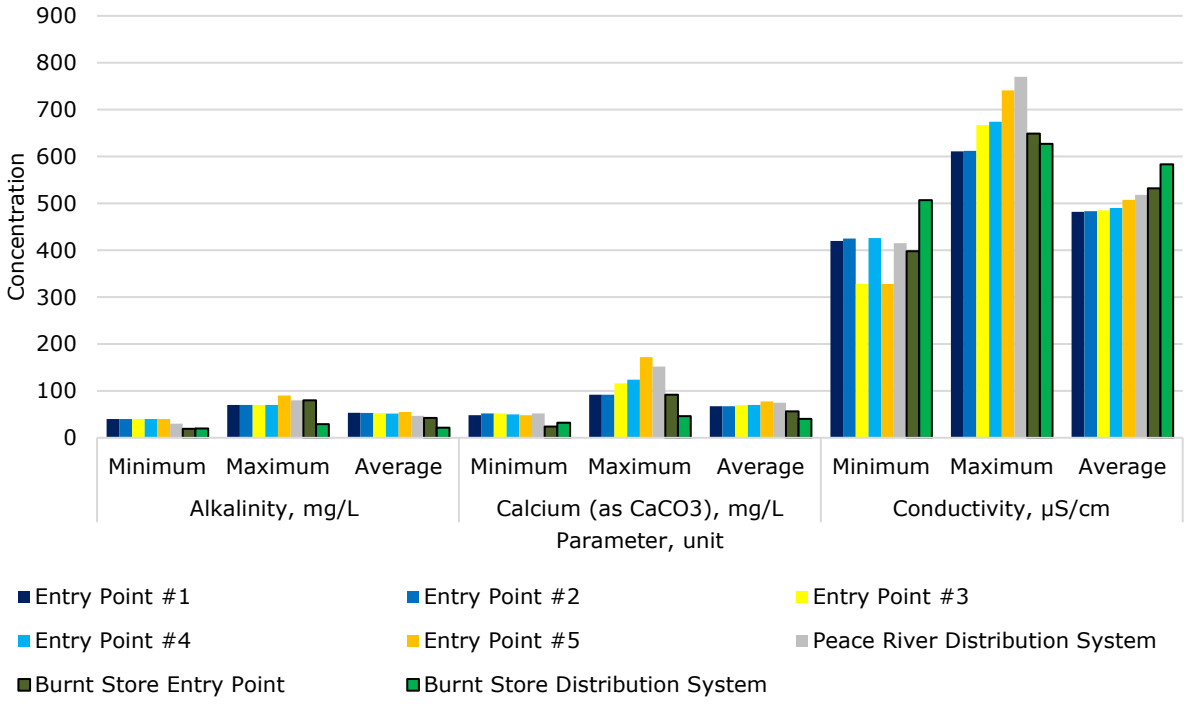
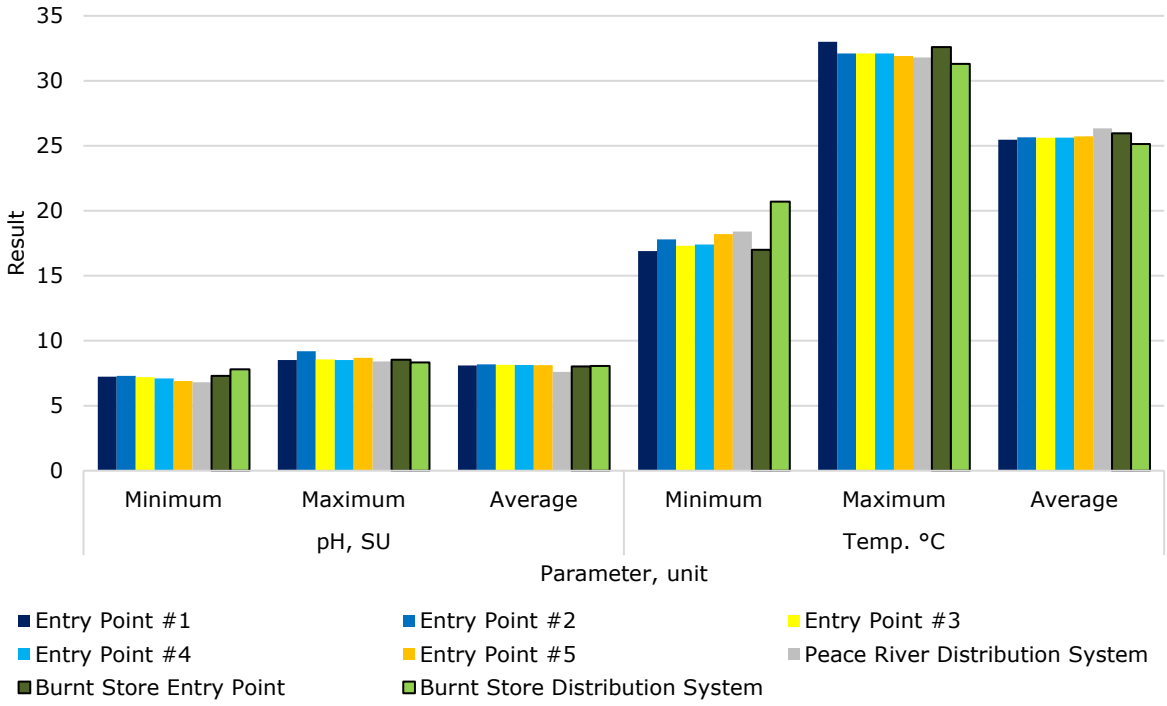


Figure 8-6 Water Quality Parameter Sampling Results for pH and Temperature from 2016–2020



The results of the water quality analysis are positive, indicating that no major defects exist in the overall system. The differences between the Port Charlotte and Burnt Store Water Systems are the result of differences in source water and treatment technology. Alkalinity

and Calcium concentrations are lower in the Burnt Store Water System because RO membranes are very effective in removing them from the source water. Conductivity is lower in the Port Charlotte Water System because of the variety of source waters and treatment technology used. The fluctuations between the maximum and minimum conductivity values in the Port Charlotte Water System were significant and were caused by CCU historical acceptance of Punta Gorda's finished water. CCU no longer regularly accepts water from Punta Gorda, but these occurrences indicate that the frequent use of interconnects with other neighboring utilities or the connection between CCU's two distribution systems would impact CCU's water quality and require a corrosion control study.

8.3 Water Age and Water Quality Modeling Scenarios

As part of the CCPWMP, Jones Edmunds expanded the use of CCU's hydraulic model to evaluate water age in the Mid and West County distribution systems, allowing for the ability to evaluate operational adjustments to improve water quality. A water age model can provide valuable information on general trends within the distribution system to identify locations of low disinfectant residuals and high DBP concentrations when considering historical water-quality results. Chemical concentrations within the water, such as chlorine or DBPs, will vary over time as decay or growth occurs in the water distribution system. In general, chlorine residual deteriorates and DBP concentrations increase over time. As a result of these reactions in the distribution system, water age can be used as an indicator for evaluating water quality as older water leads to water quality concerns.

Water-quality modeling scenarios were conducted under current minimum weekly demand and AADD conditions to determine how water age and chlorine residuals vary over time and identify water-quality improvement recommendations. Common practice is to consider the minimum weekly demand since it represents the period in which disinfectant residuals are expected to be lowest, representing the worst water quality. The minimum weekly demands are a rolling average calculated by summing the average daily flows of the previous 7 days. Table 8-4 displays the historical minimum weekly demands for the Port Charlotte Water System.

Table 8-4 Minimum Weekly Demand from 2011–2020

Year	Port Charlotte Water System Minimum Weekly Demand (MGD)
2011	26.9*
2012	27.4*
2013	51.5
2014	55.0
2015	62.8
2016	9.1*
2017	59.3
2018	57.8
2019	63.0
2020	70.7

*SCADA data missing for daily values.

In addition to the minimum weekly demand condition, Jones Edmunds modeled the AADD conditions to identify how water age behaves under normal operations and whether specific areas experience large demand variations due to seasonal residents or other factors such as new construction or localized water-conservation efforts. The implementation of water-conservation techniques such as low-flow devices reduce water demand, which increases water age and adversely affects water quality.

The water age can be defined by various benchmarks, but for modeling water distribution systems, it is typically considered as zero age at the entry point to the distribution system. For systems that operate WTPs, this is typically within a few minutes of travel time from the disinfection process. However, for consecutive systems the age is commonly considered to be zero at the interconnect or delivery point between the wholesale provider and receiving utility since the receiving utility does not often know the time required for the water to travel from the entry point to the delivery point. Considering this, Jones Edmunds evaluated two age scenarios under each demand condition. Since the Port Charlotte Water System is a consecutive system, one age scenario considered the age to be zero at each PRMRWSA supply interconnect. The second age scenario was modeled by resetting water age at each WBS. As Chapter 3 discusses and shows, CCU boosts disinfectant residual at each WBS to 4.0 mg/L based on historical data, which for monitoring disinfectant residuals resets the chlorine concentrations.

The age scenarios were simulated within CCU's water distribution models during minimum weekly demand and AADD scenarios over an EPS of 10 days. Initially, scenarios considered all water at the interconnect to be zero days old. Additional scenarios considered the age to be reset at each re-chlorination point (i.e., WBSs) within the distribution system. The simulations must be carried out until water has traveled to the farthest point in the distribution system and the storage tanks have reached equilibrium. Once equilibrium with respect to water age has been reached, a daily pattern is established and carrying the simulation out for additional days will not increase the age of water. Although no regulatory requirements exist for water age, general industry guidelines indicate that water age should not exceed 5 to 7 days in the system to maintain good water quality.

8.4 Water Age and Quality Analysis

Modeling scenarios were conducted under two demand conditions and two age scenarios to identify overall water age and areas for water-quality improvements. Figure 8-7 and Figure 8-8 depicted the modeling results when water age was assumed to be zero at the interconnects. These scenarios are used to estimate the total water age through the CCU service area and provide insight on the general conveyance and path of the water throughout the County. The total water age can be used to determine the oldest water in the distribution system, which should be considered when selecting DBP and lowest chlorine residual sampling locations.

Figure 8-7 Port Charlotte Water System Water Age Analysis – Minimum Demand Conditions (Water Age is Not Reset to Zero at WBSs)

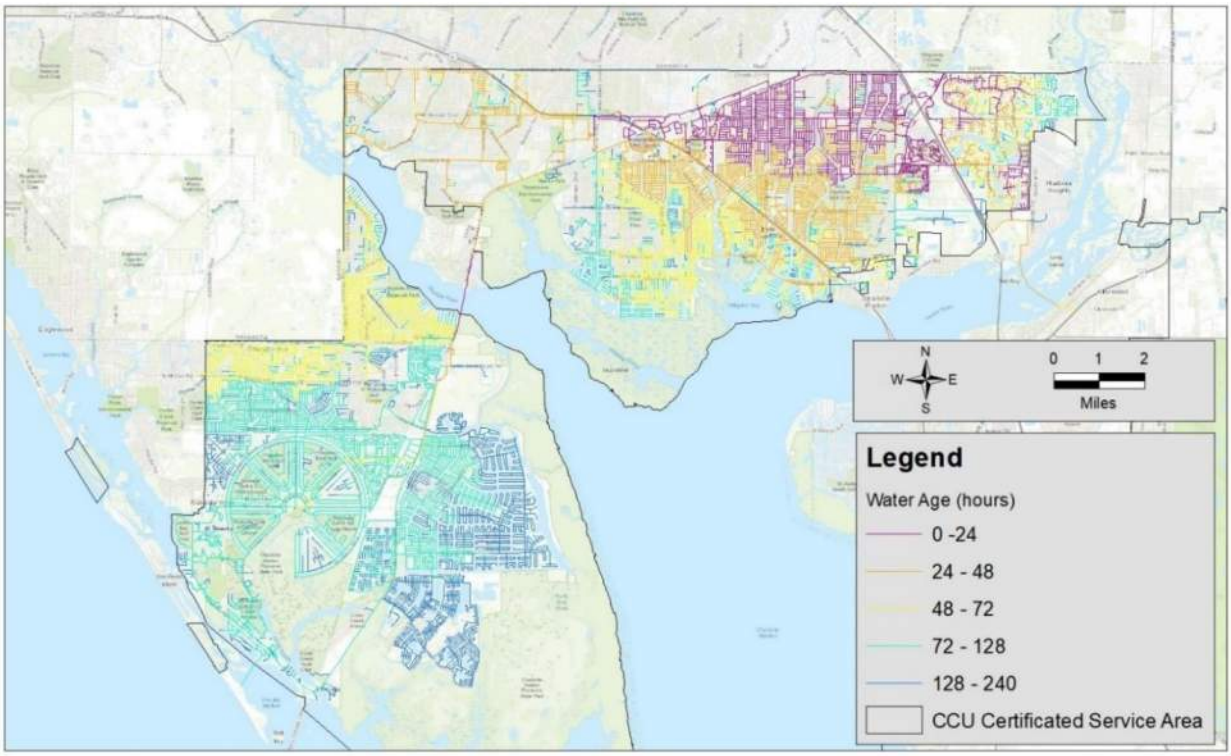
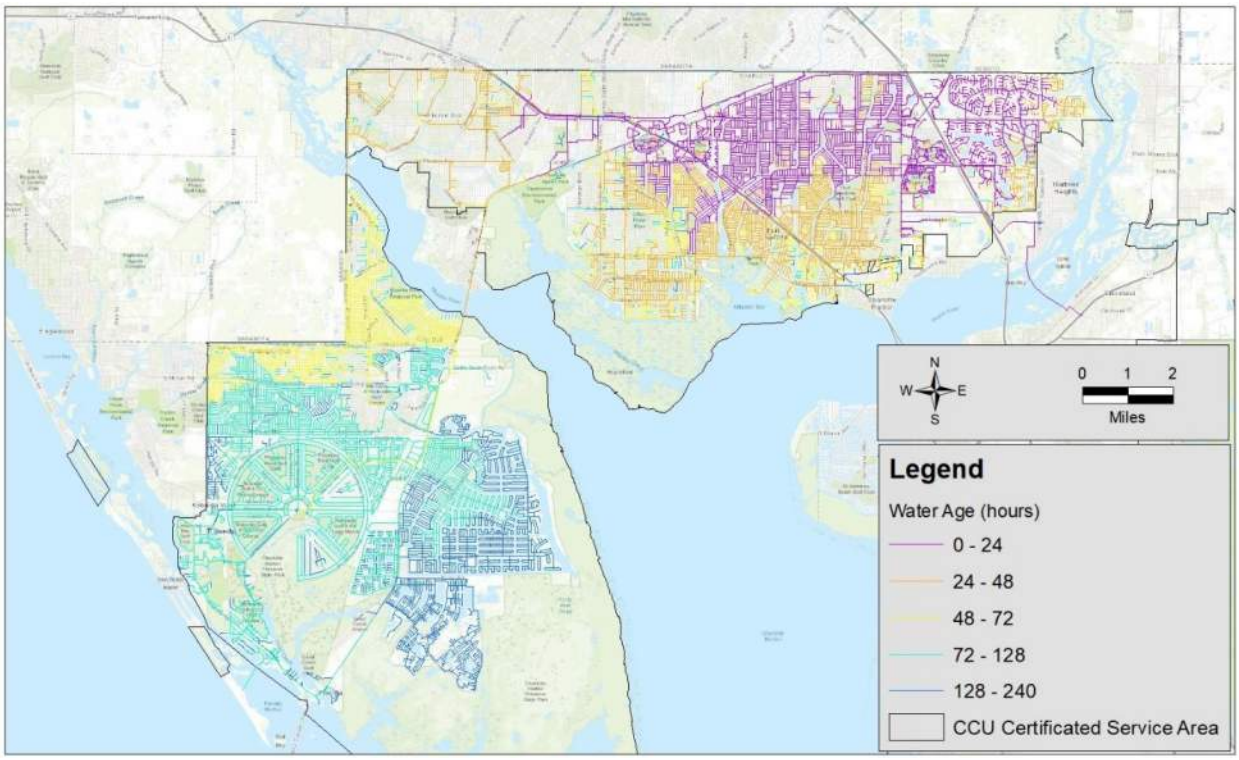


Figure 8-8 Port Charlotte Water System Water Age Analysis – AADD Conditions (Water Age is Not Reset to Zero at WBSs)



As depicted in Figure 8-7, the freshest water is in northeast Mid County near the PRMRWSA interconnect locations. The age of the water in Mid County is generally between 1 to 3 days old with some areas increasing to between 3 to 5 days. These areas typically correspond to the neighborhoods that are not well looped or have a large number of dead ends. The age increases the farther west the water travels, indicating that it takes approximately 2 to 3 days for the water to be conveyed from the PRMRWSA interconnects to West County under minimum-week conditions. Figure 8-8 displays similar trends, but water age improves by nearly 24 hours in the Deep Creek and Ackerman areas, which may indicate a more seasonal population resides in the area. West County experiences little changes when comparing minimum weekly demand to AADD conditions.

The figures indicate that the oldest water in the CCU system ranges between 5.5 and 10 days and occurs within the South Gulf Cove area of West County. These analyses assume the age to be zero at the Port Charlotte Water System interconnects, in reality it is unknown and varies depending on actual demand conditions. The water age relative to the PRMRWSA entry point at the PRMRWTF is likely significantly higher.

Figure 8-9 and Figure 8-10 depict the modeling results when the water age is reset at each WBS within the distribution system. These scenarios are used to estimate the water age through the CCU service area since the last time of re-chlorination and to identify where disinfectant residuals are low and the extent of low residuals within an area, which informs the type of mitigation or applicable water quality improvement project. These data can also be used to develop sampling plans for chlorine residual monitoring and identify the lowest point of disinfectant residual in the system.

These figures show that the freshest water originates at the WBSs and extends outward to the rest of the distribution system. The age of the water in Mid County is generally between 1 to 2 days old with some areas, increasing to between 2 to 3 days. These areas primarily include the Ackerman and Deep Creek neighborhoods. The Ackerman neighborhood has a large area with older water, which has historically been suspected to have higher water age. As such, CCU has begun construction of a WBS to improve water quality in the area.

As with the previous age scenarios, Figure 8-9 and Figure 8-10 also indicate the oldest water in the CCU system occurs within the South Gulf Cove area of West County. The areas are primarily experiencing water age between 2 and 5 days, but some water mains continue to experience water age in excess of 5 days under minimum weekly demand and AADD conditions. Through the proper placement of CCU's WBSs, most of the distribution system experiences water age below 7 days even under minimum weekly demand conditions.

The Deep Creek and South Gulf Cove areas exhibit clear differences between the minimum weekly scenario and the AADD conditions. Significant improvements in the AADD conditions indicate that CCU Operations staff likely have significant challenges in maintaining residuals in the South Gulf Cove area under minimum weekly conditions. Based on discussions with CCU staff, some improvements are made by modifying valving at different points in the year to account for changes in water demand. However, as presented in Section 8.2, CCU staff also must continue to flush high quantities of water to maintain residuals.

Figure 8-9 Port Charlotte Water System Water Age Analysis – Minimum Demand Conditions (Water Age Reset to Zero at WBSs)

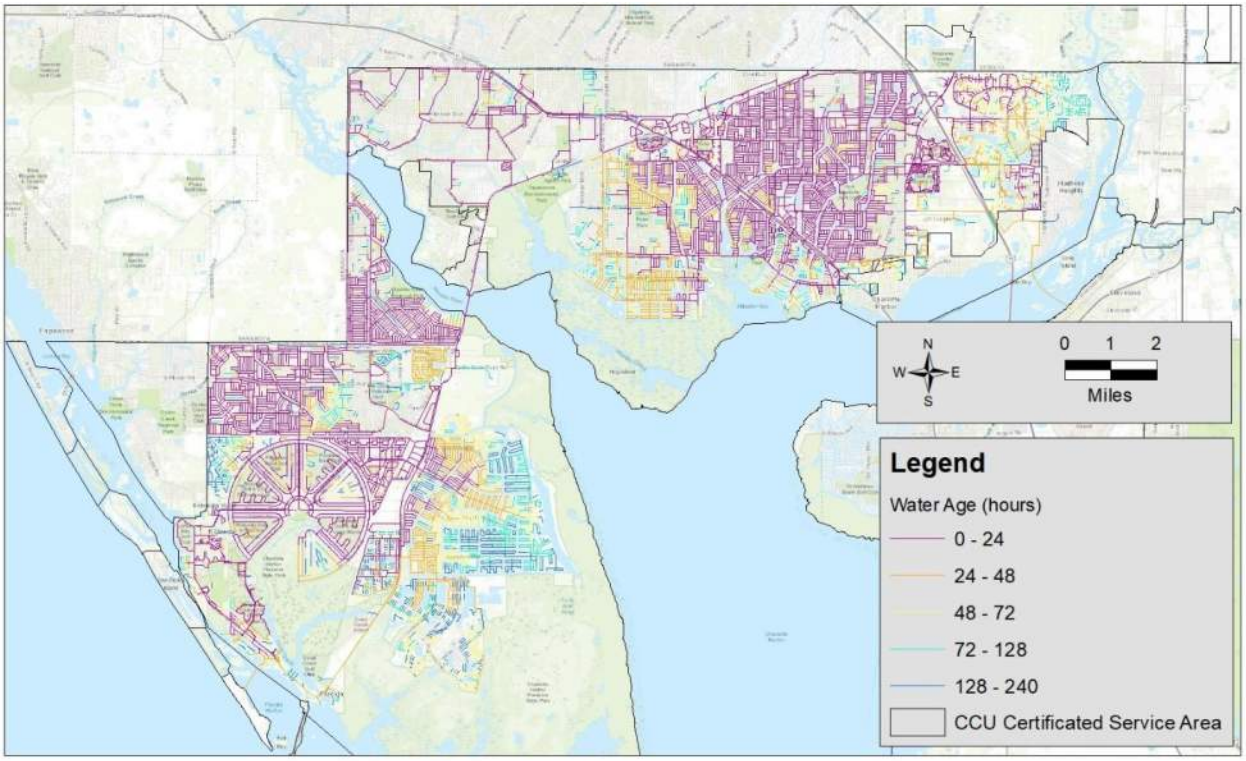
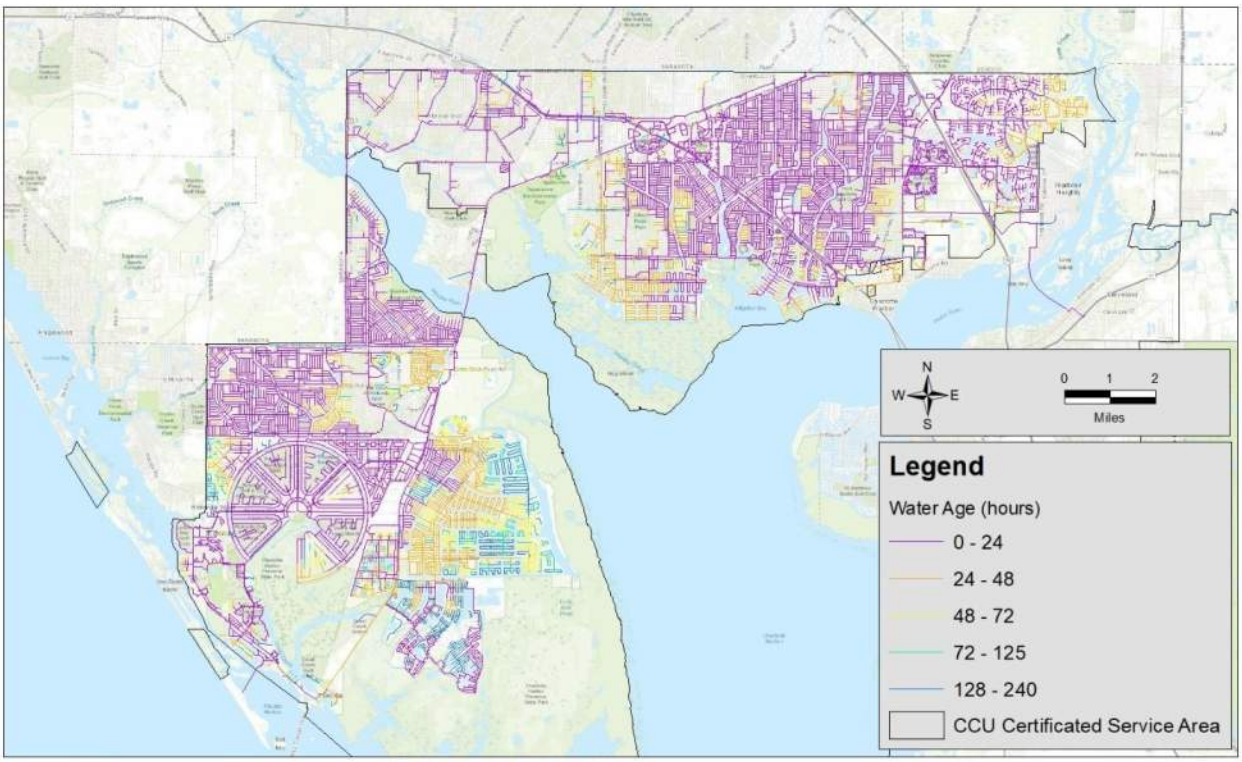


Figure 8-10 Port Charlotte Water System Water Age Analysis – AADD Conditions (Water Age Reset to Zero at WBSs)



8.5 WATER-QUALITY IMPROVEMENT STRATEGIES

As mentioned previously, CCU staff historically developed a flushing plan to improve water quality throughout the distribution system and meet FDEP requirements. However, CCU historical hydrant flushing equates to approximately 1 MGD, representing a significant portion of the PRMRWSA allocation and loss of revenue. Using the water age analysis, Jones Edmunds identified areas where flushing could be reduced by alternative residual disinfectant maintenance methods.

Three primary methods exist for managing disinfectant concentrations and improving water quality in distribution systems are hydrant flushing, system looping, or chemical boosting. The various methods are appropriate for addressing chlorine residual based on the piping network in the distribution system and contain their own advantages and disadvantages. Table 8-5 summarizes the advantages and disadvantages and the typical uses for each method.

Table 8-5 Residual Disinfectant Maintenance Methods

Method	Advantages	Disadvantages	Best Used For
Hydrant Flushing	Requires little capital costs, can be performed quickly, and reduces water age.	Increases non-revenue water and requires maintenance.	Addressing dead-ends with small water mains.
Pipe Looping	Conserves water, requires little maintenance, and has no O&M costs	Requires capital costs, increases water age, and impacts water quality elsewhere.	Addressing dead-ends with large water mains or central areas in the distribution system.
Chemical Boosting	Conserves water, increases operational control, and resets water age.	Requires capital costs, increases O&M and chemical costs, and increases DBPs.	Addressing central areas in the distribution system or areas that require more pressure.

Based on the results shown in Figure 8-9 and Figure 8-10 and the guidance provided in Table 8-5, the following water quality improvements have been developed. The projects are prioritized based on the total historical quantity of flushed water with recommendations for areas flushing approximately 200,000 gpd or greater as depicted in Figure 8-3. In general, the greater the amount of water flushed, the higher the priority.

- **Priority 1**: The Ackerman area south of Murdock Circle in Mid County requires significant flushing to maintain chlorine residuals. CCU staff developed a flushing plan to improve the water quality in the Ackerman area by using up to 14 auto-flushers, which uses approximately 200,000 gpd (6.4 MG monthly). Water modeling determined that installing a new WBS in the Ackerman area with a re-chlorination system would improve water quality by increasing chlorine residuals and decreasing the need for flushing.
- **Priority 2**: The South Gulf Cove area east of Rotonda Circle in West County experiences low chlorine residuals. CCU staff have closed valves throughout this portion of the distribution system to redirect flows for automatic flushing to improve water quality. Additional improvements are necessary for further refinement of chlorine residuals within the area. Hydraulic modeling concluded the need for approximately 1,300 LF of

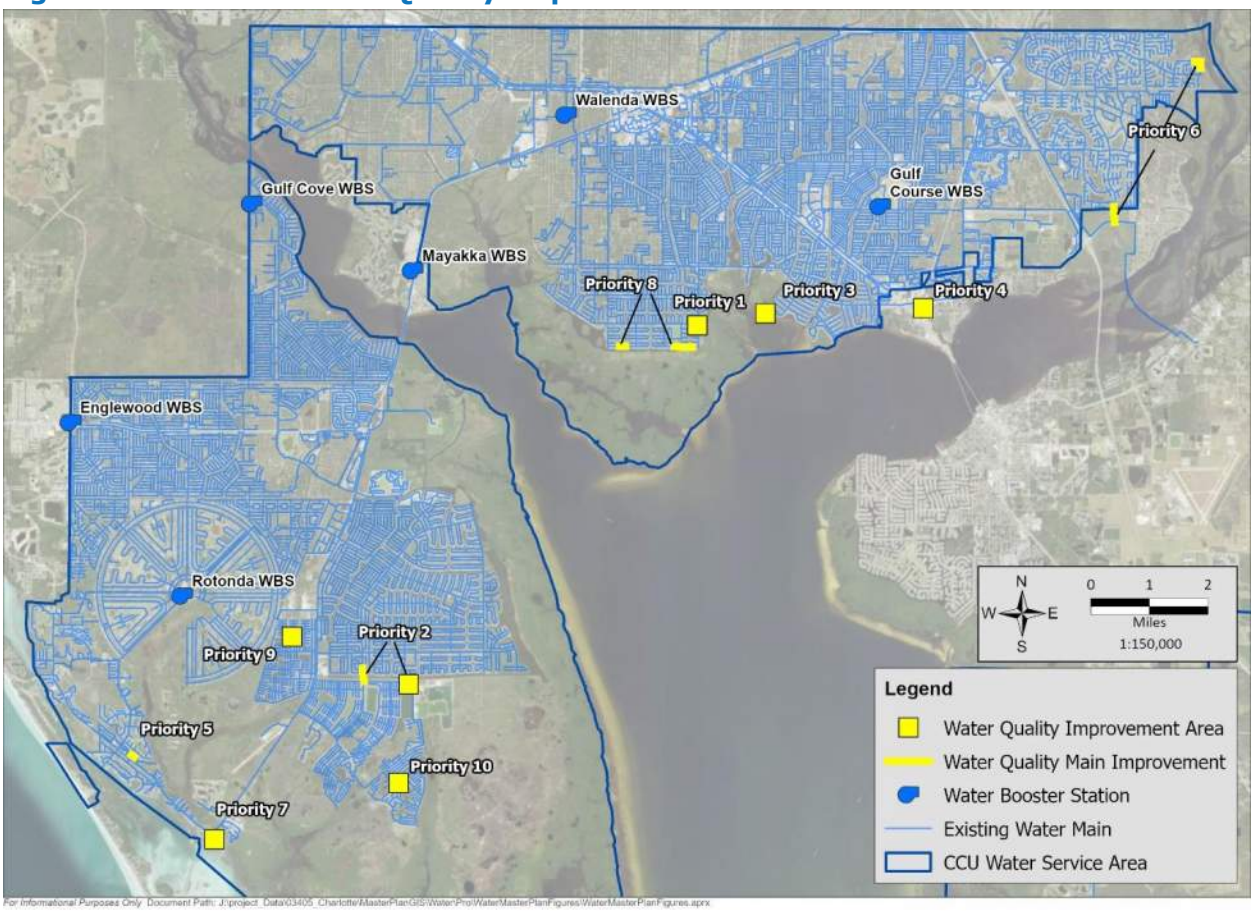
12-inch water main extension under the Santa Cruz Waterway with a new WBS and a re-chlorination system near Robin Road and Oil Well Road. This will provide system looping and direct fresh chlorinated water to areas with poor residuals. The modeling also recommended confirming valve operation within the area to determine the most efficient path for water distribution.

- **Priority 3**: The area near Port Charlotte Beach Park in Mid County is a dead-end of the distribution system with low demand. The area is considered built-out; however, the Charlotte Harbor State Park is in this area. Increasing the system demands in this area will drive fresh chlorinated water into the dead-end and improve water quality. This may include installing water-use devices to enhance recreational activities at the Charlotte Harbor State Park.
- **Priority 4**: The shopping center near Kings Highway and Harborview Road in Mid County experiences low chlorine residuals. The current valve operations dead end the system just west of the shopping plaza. Opening the 12-inch valve at the intersection of Edgewater Drive and Lister Street improves water quality within the area.
- **Priority 5**: The area behind Fire Station 14 in West County experiences low chlorine residuals due to inadequate distribution system looping. CCU routinely flushes this area to improve water quality. Installing approximately 300 LF of 6-inch pipe along Pompano Street to loop the distribution system is recommended to improve chlorine residuals.
- **Priority 6**: The Deep Creek area in northeast Mid County has low residuals and requires routine flushing. A 12-inch water main connection from Rio de Janeiro Avenue to Harborview Road is needed for fire flow looping requirements. However, this connection has no effect on water quality in the subdivision. Looping the 6-inch water main along Posadas Circle is recommended to increase water quality in the subdivision. This removes the dead-end where flushing currently occurs and according to the modeling results improves water quality significantly.
- **Priority 7**: The area near Placida Park in West County experiences low chlorine residuals and has historically represented the farthest point in the system. Based on discussions with CCU staff, this location also experiences a hydraulic gradient by receiving flow from Placida Road and Gasparilla Road. As such, CCU routinely flushes this area to maintain chlorine residuals. Based on the infrastructure in the area, little improvements are expected from looping, and therefore CCU should consider options such as installing water-use devices to enhance recreational amenities in the area.
- **Priority 8**: Based on the results from implementing Priority 1, additional improvements may be required to address dead-end water mains in the Ackerman area. To improve water quality related to dead-ends, CCU should install approximately 700 LF of 6-inch water main under the Melbourne Waterway and approximately 1,800 LF of 6-inch water main under the Ayrshire and Indianapolis Waterways.
- **Priority 9**: The Meadows and Villas development area southeast of Rotonda Circle in West County is not currently fully developed, causing water-quality concerns for the existing piping infrastructure throughout the subdivision. CCU staff have closed valves throughout this portion of the distribution system to redirect flows for automatic flushing to improve water quality. The additional improvements recommended in Priority 2 will improve water quality significantly throughout this area. In addition, infilling the development will further improve chlorine residuals.
- **Priority 10**: The neighborhood east of South Gulf Cove Park in West County experiences poor water quality. Improvements implemented in Priority 2 and Priority 7

improve water quality in this area based on modeling results. Additionally, infilling the development will further refine water quality in this area by increasing demands.

Figure 8-11 depicts the water quality improvement projects identified to improve the system chlorine residuals and minimize the amount of water lost through automatic flushing procedures. Based on the water-age analysis results, the County should implement the Priority 1 and 2 projects to improve water quality and significantly reduce flushing in the Ackerman and South Gulf Cove areas of the distribution system. Additional significant improvements for minimizing flushing can be obtained by implementing the Priority 3 through Priority 7 projects. Priority 8 through 10 projects should be considered only after Priority 1 and 2 projects are completed and additional data are collected to justify the need.

Figure 8-11 Water Quality Improvements Areas



Since water quality changes with water demands, distribution system piping, and operational changes, the modeling should be an iterative process that considers recent additions. As such, CCU should continue to collect water quality and flushing data and use modeling software to analyze areas where flushing can be reduced. In addition, the hydrant flushing program should be enhanced by developing a unidirectional flushing program, which may further reduce overall flushing and provide a general maintenance program for maintaining fresh water supply throughout the distribution system.

9. CAPITAL MAINTENANCE AND IMPROVEMENT PROJECTS

OVERVIEW

Chapter 9 summarizes the recommendations developed in Chapters 2 through 8 to address water supply, conservation, conveyance, and quality to meet the current and future water needs of the Port Charlotte and Burnt Store Water Systems until 2045. The recommendations have been identified, named, and categorized into maintenance projects, Capital Maintenance Programs (CMPs), reports and studies, and CIPs.

9.1 MAINTENANCE PROJECTS, CAPITAL MAINTENANCE PROGRAMS (CMPS), AND REPORTS AND STUDIES

The following sections organize the recommendations from this planning effort into capital maintenance projects, recommendations to enhance existing CMPs, and planning-related reports and studies. Capital maintenance projects refer to projects that were identified through the master planning effort but are less routine than typically O&M items. These projects generally exceed $100,000 and are often identified from the various CMPs. The second section includes recommendations for enhancing CCU's existing CMPs. CMPs are an important planning mechanism for budgeting and implementing O&M strategies. O&M is an essential component for utilities in meeting the expected life of assets and equipment; therefore, preventive maintenance is critical. Utilities that implement successful O&M strategies typically experience an overall reduction in R&R costs. The recommendations were developed to enhance CCU operations to meet industry BMPs and to comply with local ordinances and regulations. The final section lists the planning-related projects, which include system condition evaluations, permitting efforts, and feasibility studies. Reports and studies allow utilities to conduct evaluations at an as-needed level of detail and make informed decisions based on results – a critical component for long-term success of utility operations and prioritizing CMP projects and CIPs.

9.1.1 RECOMMENDED MAINTENANCE PROJECTS

The maintenance projects that should be completed in addition to the ongoing maintenance projects identified in Section 2.4.1 include:

- Replace multiple end caps that are leaking on Trains C and D at the Burnt Store RO WTP and continue to monitor performance and budget for the replacement of the RO membranes at the Burnt Store WTP.
- Conduct a capacity analysis for the Burnt Store RO WTP to evaluate the capacity of each system component and determine the rated capacities of the facility.

9.1.2 Capital Maintenance Program Recommendations

CCU has established a number of CMPs as discussed in Section 2.4.2; the following section provides recommendations for modifying or adding to CCU's existing CMPs.

Potable Water Connections and Meter Maintenance:

- Modify the meter maintenance program to replace potable water connection meters at a minimum of once every 10 years to ensure accurate water usage data for billing and water conservation purposes.

Water Usage Monitoring Program:

- Develop a standard for quantifying (or estimating) irrigation water usage from private raw water wells and potable water connections. The water supply quantities can be used for future planning of water supplies and/or reclaimed water supplies.
- Develop a customer survey to help track the effectiveness of public education water conservation efforts.
- Develop incremental water conservation goals (i.e., 5-, 10-, 15-, and 20-year) for the WCP to track the success of water conservation efforts.
- Perform modeling analysis in Deep Creek area to determine if looping or a chemical booster station can reduce flushing.

Potable Water Fire Hydrant Installation and Maintenance Program:

- Incorporate the ability to track hydrant maintenance, repairs, and inspection activities conducted by CCU and the Fire & EMS Fire Division.
- Perform field confirmations of the areas identified to have fire flow deficiencies. Verify the level of fire protection being provided meets CCU standards and if not, determine the need for improvements. This may include replacing the fire hydrant, hydrant main, local valves, distribution system mains, and/or water-boosting facilities.
- Replace 4-inch diameter fire hydrant mains with larger diameter mains to meet CCU LOS, specifically as it relates to fire flow. Mains larger than 8-inch diameter may need to be considered for commercial properties and larger buildings.
- Continue installing new hydrants for 87 residential property and 40 commercial property areas to meet CCU fire protection standards in Mid and West Counties.
- Develop an R&R program for replacing fire hydrants. Typically, hydrants have a life expectancy of 40 to 60 years.

Identification of Lead and Galvanized Service Lines Program (refer to 40 CFR 141.84):

- Investigate service lines and identify material type, specifically identifying lead and galvanized service lines within the CCU PWSs. The historical development of CCU's systems suggest services installed after 2005 are primarily PVC or polyethylene (PE).
- Record service line materials in the CCU *GIS Mapbook* to meet the Revised LCR legislation. Complete and submit a lead service line (LSL) inventory to FDEP. The inventory should include a location identifier such as address, intersection, or landmark; it must be updated annually. To meet FDEP requirements, service line material records should be subcategorized as "lead," "galvanized requiring replacement," "non-lead," or "lead status unknown." Non-lead is inclusive of copper.

- Develop an LSL replacement program for service lines identified as lead and galvanized service lines downstream of LSLs; if the extent of LSLs upstream is unknown, the galvanized line must be replaced or additional upstream investigation must be conducted.
- Submit an LSL replacement plan to FDEP by October 16, 2024. The PWS will be required to conduct LSL replacements at rates based on water quality results; consumer tap sampling is required within 3-6 months of LSL replacement.

Predictive, Preventative, and Corrective Maintenance Program:

- Continue to replace old "class" PVC pipe in the Burnt Store Water System with new C-900 PVC pipe.
- Review GIS and determine neighborhoods that require additional supply mains to increase system resilience in the Port Charlotte Water System and Burnt Store Water System. The objective is to serve each neighborhood with at least two mains.
- Continue to update the hydraulic models with updated information from CCU's GIS and Cityworks models. Continue to refine the accuracy of the hydraulic models using available SCADA data, geographic information, work orders, completed projects, and field reports.
- Identify options to increase resilience of the Burnt Store Water System considering interconnects with neighboring utilities or alternative water supplies.

Identification and Replacement of AC Pipe and Undersized Pipe Program:

- Expand on CCU's ability to collect information on horizontal and buried assets working across departments and projects to maximize efforts (i.e., parks, roadway, and septic to sewer).
- Identify what information should be collected on these assets to assist in future regulatory compliance and BMPs. At a minimum, CCU should include pipe material, size, location, and age (estimated or installed date) but should also consider information such as pipe condition and criticality.
- Expand CCU's ability to categorize and update information on horizontal assets within the CCU GIS database to enhance the accuracy of the data.
- Develop and train staff on a form and standard procedure for collecting and incorporating the data into the GIS approved database.
- Continue to identify AC pipe and prioritize the replacement according to local ordinance and new regulations.
- Continue to identify water distribution mains below 6 inches in diameter (and old class PVC water mains) and prioritize the replacement based on available funding. In general, distribution mains shall not be less than 8-inch diameter. Case-by-case evaluation should be conducted to determine allowance of 6-inch-diameter mains for looped distribution mains and dead-end distribution main pipe runs (includes cul-de-sacs) which are less than 250 feet in length.
- Program should encompass broad range of piping identification, i.e., water distribution mains, hydrants mains, facilities yard piping, etc.

9.1.3 Reports, Permits, and Studies

In addition to the reports and studies required by permitting agencies, CCU should prepare and conduct the following reports and studies to aid in system optimization and water supply planning:

- Conduct additional hydrogeological investigations including aquifer performance testing and groundwater flow models to assess the safe yield of the Babcock Ranch water supply.
- Proceed with modifying the Babcock Ranch WUP to increase supply and change the permit conditions from secondary use to primary use.
- Conduct a feasibility study for potable reuse at the Burnt Store WRF. The feasibility study should include source water characterization as it relates to water quantity and quality, regulatory concerns including permitting requirements and emerging contaminants, treatment technology review and evaluations for direct and indirect options, capital and O&M costs, funding opportunities, and a market study to determine the impact on potable and reclaimed water rates. Considerations for potable reuse at Burnt Store WRF should include determining the use of Well RO-15.
- Assess the viability of aquifer recharge (Class V) at the Burnt Store WRFs where excess reclaimed water could be used to supplement aquifer supplies within the SWUCA and increase the resilience of the Burnt Store wellfield. Studies should consider the impact of sea level rise on groundwater supplies, existing system infrastructure, regulatory and permitting considerations, treatment requirements, and public outreach. This assessment should also be considered when investigating a potable reuse project.

9.2 Capital Improvement Projects

CIPs can be differentiated from CMP projects in that it typically involves new construction that increases the overall value of the system. The CIPs were presented in the recommendations sections of Chapters 3, 6, and 7 and include projects to address potential deficiencies identified for raw water supplies, water treatment facilities, water storage, pumping facilities, and transmission and distribution main pipelines in the Port Charlotte Water System and Burnt Store Water System.

The CIPs outlined in Chapter 8 are associated with improving the water quality of the distribution system and are significantly impacted by changes in water demands. Therefore, CCU should proceed with installing two WBSs (Priority 1 and 2 projects) to reduce hydrant flushing and address the large area water quality issues in Ackerman and the South Gulf Cove area in the near term.

9.3 Capital Improvement Plan

Table 9-1 summarizes the recommended CMPs and CIPs required in the Port Charlotte and Burnt Store Water Systems. The table includes the project type, identifier, project name, priority, area served, and project cost. The identifier was developed to establish a naming convention consistent with other CCU planning documents. It specifies the location (M-Mid County, S-South County, W-West County), type (WBS-Water Booster Station, WM-Water Main, WTP -Water Treatment Plant), and number for each project. CMPs were assumed to have a budget of $250,000 annually. CIPs costs account for design and permitting,

contractor mobilization/demobilization, overhead and profit, and construction contingency. Total project costs are presented in the CIP tables represent planning-level estimates and do not include inflation, administrative fees, or capitalized interest.

Figure 9-1 displays the County-wide project location map including the size and route of the recommended pipeline CIPs based on modeling results discussed in Chapter 7. Figure 9-2 displays the phasing for each water system CIP for the near-term and long-term improvement periods. Phasing for the water CIPs may be accelerated or deferred as required to account for changes in development schedules, availability of land or right-of-way for construction, and other external considerations. Appendix F includes additional detail for each capital maintenance project, CMP, study, and CIP.

Table 9-1 Capital Maintenance and Improvement Projects

Project Type and Projects	Present-2025	2026-2030	2031-2035	2036-2040	2041-2045	Total
CMP - Annually Recurring	**$13,125,000**	**$26,250,000**	**$25,000,000**	**$25,000,000**	**$25,000,000**	**$114,375,000**
CMP-1 - Potable Water Fire Hydrant Installation and Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-2 - Potable Water Connections and Meter Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-3 - Water Usage Monitoring Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-4 - Identification and Replacement of Lead and Galvanized Service Lines Program	$625,000	$1,250,000	$0	$0	$0	$1,875,000
CMP-5 - Predictive, Preventative, and Corrective Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-6 - Identification and Replacement of AC Pipe and Undersized Water Mains Program	$10,000,000	$20,000,000	$20,000,000	$20,000,000	$20,000,000	$90,000,000
Reports/Studies	**$3,200,000**	**$150,000**	**$0**	**$500,000**	**$0**	**$3,850,000**
S-WTP-5 - Babcock Ranch Wellfield Groundwater Modeling	$3,000,000	$0	$0	$0	$0	$3,000,000
S-WTP-6 - Babcock Ranch Permit Modification	$200,000	$0	$0	$0	$0	$200,000
S-WTP-4 - BS WTP Capacity Assessment	$0	$150,000	$0	$0	$0	$150,000
S-WTP-7 - Potable Reuse Feasibility Study	$0	$0	$0	$250,000	$0	$250,000
S-WTP-8 - Aquifer Recharge Feasibility Study	$0	$0	$0	$250,000	$0	$250,000
Water Supply	**$6,000,000**	**$185,100,000**	**$87,250,000**	**$84,475,000**	**$72,075,000**	**$434,900,000**
S-WTP-1 - Burnt Store Wellfield Expansion	$6,000,000	$10,000,000	$0	$0	$0	$16,000,000
S-WTP-9 - Babcock Ranch Wellfield Design and Construction	$0	$45,600,000	$22,650,000	$10,625,000	$10,625,000	$89,500,000
S-WTP-10 - Babcock Ranch RO WTP Design and Construction	$0	$55,000,000	$27,400,000	$41,200,000	$41,200,000	$164,800,000
S-WM-19 - Babcock Ranch Raw Water Transmission Main and Booster Station	$0	$38,700,000	$19,300,000	$11,250,000	$11,250,000	$80,500,000
S-WM-21 - Mid County Transmission Main	$0	$23,800,000	$11,900,000	$0	$0	$35,700,000
S-WM-20 - South County Transmission Main	$0	$0	$0	$12,400,000	$0	$12,400,000
M-WBS-11 - Mid County Water Source Blending Station	$0	$12,000,000	$6,000,000	$9,000,000	$9,000,000	$36,000,000
Facilities	**$17,401,000**	**$18,843,000**	**$4,500,000**	**$0**	**$0**	**$40,744,000**
W-WBS-1 - Gulf Cove Pipe Replacement	$218,000	$0	$0	$0	$0	$218,000
W-WBS-2 - Gulf Cove Pumping Upgrade Phase-1	$450,000	$0	$0	$0	$0	$450,000
M-WBS-3 - Walenda Pumping Upgrade Phase-1	$750,000	$0	$0	$0	$0	$750,000
W-WBS-4 - Rotonda Pumping Upgrade Phase-1	$600,000	$0	$0	$0	$0	$600,000
S-WBS-5 - Heritage Landing WBS	$4,500,000	$0	$0	$0	$0	$4,500,000
M-WBS-8 - O'Hara WBS	$2,343,000	$0	$0	$0	$0	$2,343,000
S-EST-1 - Tuckers Grade EST	$4,000,000	$0	$0	$0	$0	$4,000,000
S-WTP-3 - BS WTP RO Process Improvements	$540,000	$0	$0	$0	$0	$540,000
W-WBS-9 - Gulf Cove Upgrade Phase-2	$4,000,000	$3,000,000	$0	$0	$0	$7,000,000
M-WBS-6 - Walenda Upgrade Phase-2	$0	$6,000,000	$0	$0	$0	$6,000,000
W-WBS-7 - Rotonda Upgrade Phase-2	$0	$7,500,000	$0	$0	$0	$7,500,000
W-WBS-10 - Robin Road WBS	$0	$2,343,000	$0	$0	$0	$2,343,000
S-WTP-2 - Burnt Store WTP Pumping Upgrade	$0	$0	$4,500,000	$0	$0	$4,500,000
Pipeline	**$43,068,000**	**$33,438,000**	**$11,758,000**	**$17,717,000**	**$0**	**$105,981,000**
M-WM-1 - CCU-PRMRWSA Phase IIB Expansion	$37,500,000	$0	$0	$0	$0	$37,500,000
S-WM-5 - Shotgun Road	$1,664,000	$0	$0	$0	$0	$1,664,000
M-WM-6 - Sherbourne Street	$3,054,000	$0	$0	$0	$0	$3,054,000
S-WM-4 - Green Gulf Blvd	$850,000	$1,800,000	$0	$0	$0	$2,650,000
M-WM-3 - Toledo Blade Blvd	$0	$820,000	$0	$0	$0	$820,000
W-WM-7 - Rotonda Blvd North	$0	$25,538,000	$0	$0	$0	$25,538,000
S-WM-14 - South Green Gulf Blvd	$0	$880,000	$0	$0	$0	$880,000
M-WM-18 - Rio De Janeiro	$0	$1,350,000	$0	$0	$0	$1,350,000
S-WM-2 - Tuckers Grade	$0	$2,250,000	$2,250,000	$0	$0	$4,500,000
S-WM-13 - Los Lomas Drive	$0	$800,000	$2,850,000	$0	$0	$3,650,000
W-WM-0 - McCall Road Transmission Main Upgrade	$0	$0	$224,000	$0	$0	$224,000
W-WM-8 - Wilmington Blvd	$0	$0	$2,402,000	$0	$0	$2,402,000
M-WM-10 - Melbourne Crossing	$0	$0	$63,000	$0	$0	$63,000
M-WM-11 - Ayrshire Crossing	$0	$0	$162,000	$0	$0	$162,000
W-WM-12 - Santa Cruz Crossing	$0	$0	$247,000	$0	$0	$247,000
S-WM-15 - Jones Loop	$0	$0	$3,500,000	$0	$0	$3,500,000
M-WM-22 - Posadas Circle Loop	$0	$0	$60,000	$0	$0	$60,000
W-WM-9 - Gulfstream Blvd	$0	$0	$0	$2,750,000	$0	$2,750,000
S-WM-16 - Zemel Road	$0	$0	$0	$6,592,000	$0	$6,592,000
S-WM-17 - Tamiami Trail	$0	$0	$0	$8,375,000	$0	$8,375,000
Grand Total	**$82,794,000**	**$263,781,000**	**$128,508,000**	**$127,692,000**	**$97,075,000**	**$699,850,000**

Figure 9-1 Capital Improvement Project Map

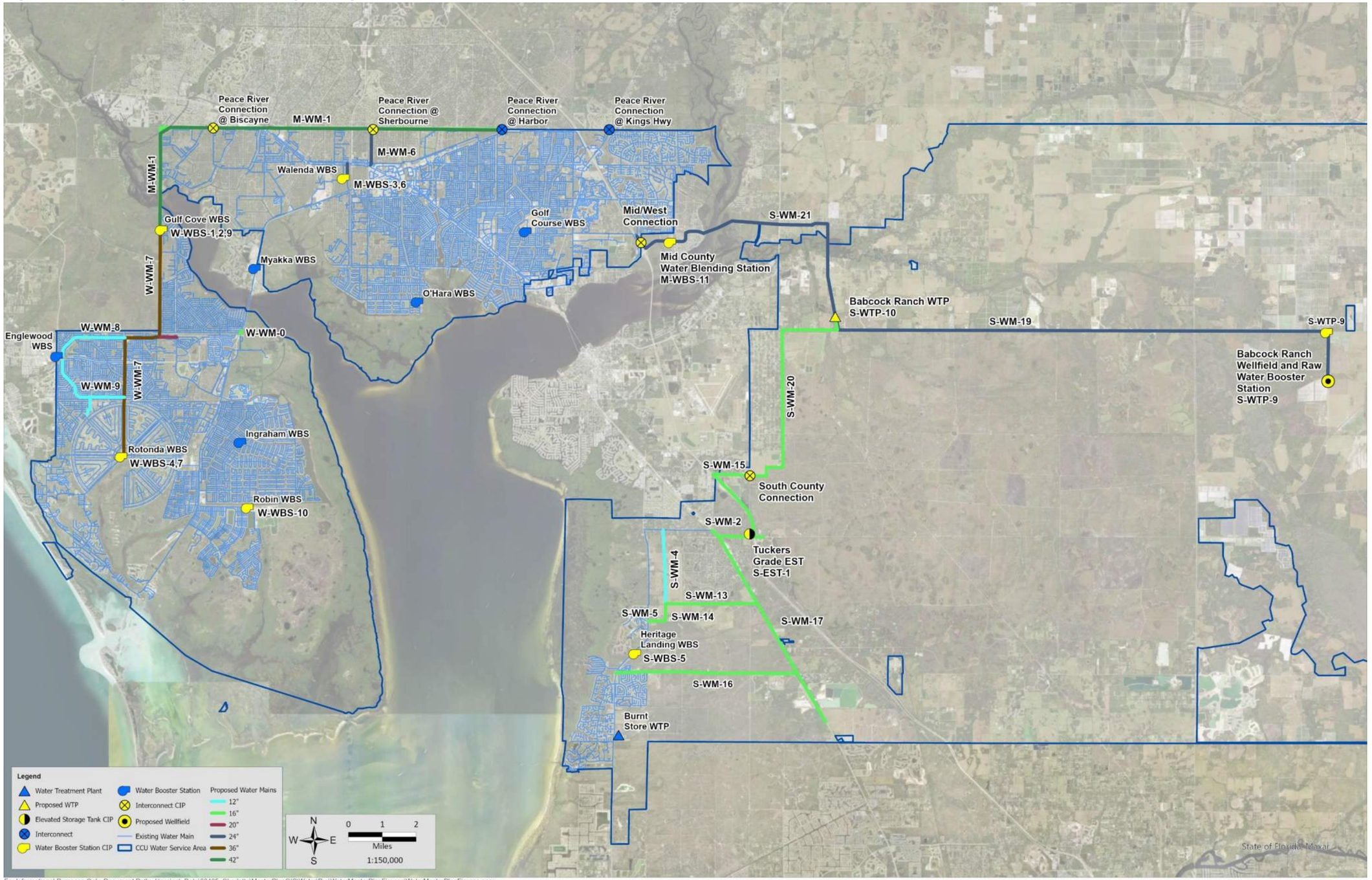


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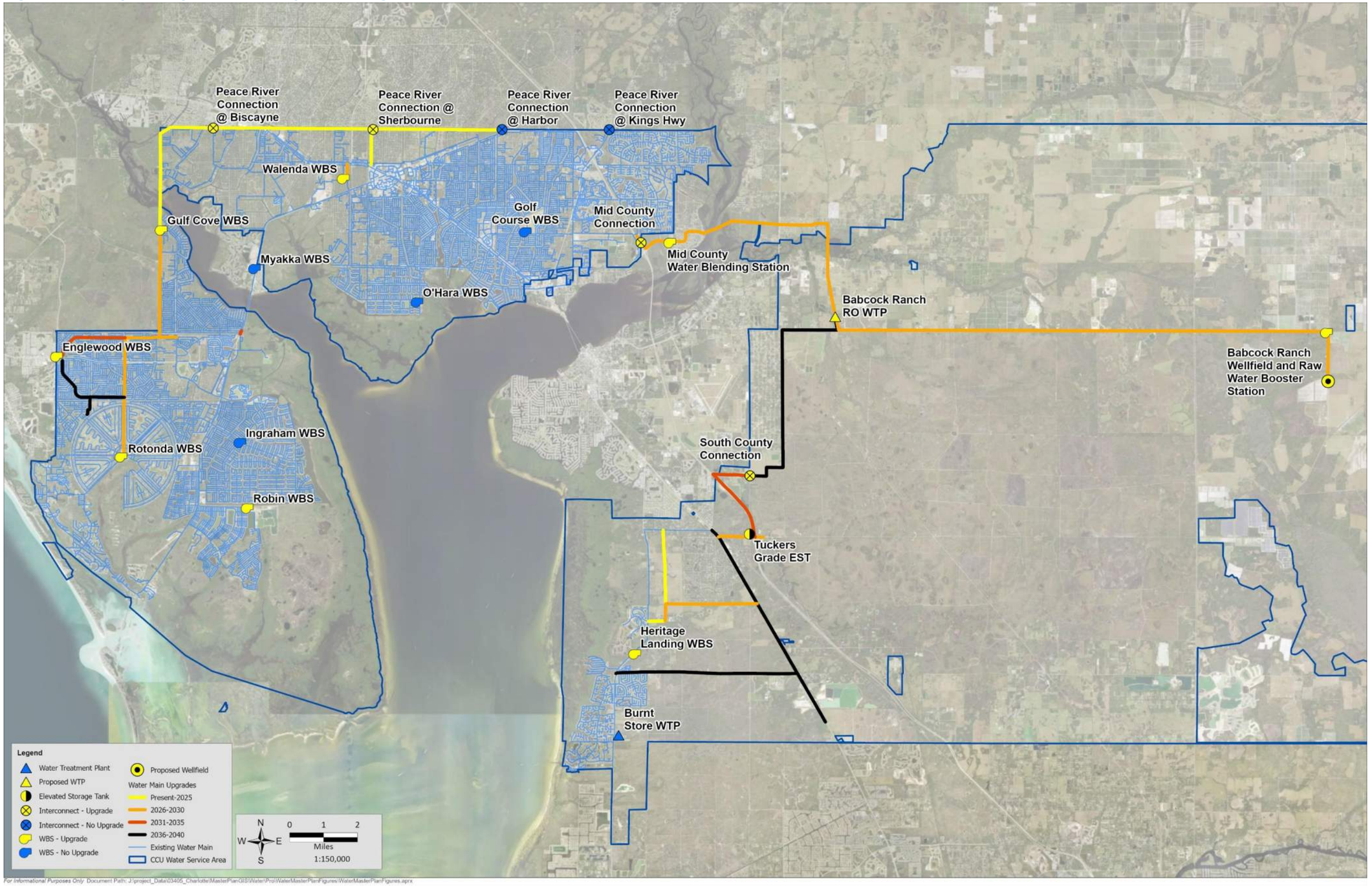
Figure 9-2 Capital Improvement Project Phasing



10. FINANCING AND FUNDING OPTIONS

OVERVIEW

CCU intends to minimize the financial burden that the water system expansion upgrades will have on their utility customers. To reduce the potential future impact on their customers, the County is exploring funding opportunities including grants, loans, and municipal options, which can at least partially offset the infrastructure improvement costs. This section reviews these options.

The options described below are developed and presented based on what is known about the proposed improvements and the funding options at this time. Both will likely change. A more robust funding options review and a Rate and Utility Revenue Sufficiency Study should be considered in the future. The Study will present a financial forecast to evaluate the ability of the revenues derived from CCU's water and wastewater system operations to fully fund the estimated cost of providing service and maintaining a strong fiscal position that promotes rate sustainability over time.

10.1 Funding Sources

10.1.1 Grant Funding Options

At the state level, agencies the County may submit grant applications to include SWFWMD, SFWMD, Florida Department of Economic Opportunity (DEO), FDEP, and the Florida Division of Emergency Management (FDEM). Many grant funding sources are based on the demographics of the grantee and/or the area impacted or benefitted by the project. CCU is not considered a Rural Areas of Opportunity (RAOs) or Rural Economic Development Initiative (REDI) community, is not in a state of financial hardship, and is not primarily low-income or minority communities. Although repayment is not required with grant programs, the County may experience a certain level of administrative and other costs pursuing and executing grants; projects are also often considered more competitive if the County can provide a cash match or in-kind services.

SWFWMD has one active grant funding program, the Cooperative Funding Initiative (CFI). The stated objective of the CFI is to assist local governments, public and private water providers, and other entities with construction and/or implementation of alternative water supply (AWS) and reuse and water conservation (WC) projects that support or complement SWFWMD's mission, especially in the SWUCA. Projects that help create sustainable water resources, enhance conservation efforts, restore natural systems, and provide flood protection are aligned with SWFWMD's mission. The CFI will cover up to 50 percent of the cost of such projects and is a valuable cost-saving opportunity for projects like DPR, increasing the PRMRWSA allocation, and potentially new groundwater wells.

Like CFI, SFWMD facilitates the Cooperative Funding Program (CFP) intended to assist local governments and utilities with funding water conservation and AWS projects. The SFWMD FY23 grant funding application deadline has not yet been announced, but grant applications are typically due in the Fall. Only a small percentage of the CCU service area is within the SFWMD boundary. This funding option will likely not contribute a significant dollar amount to any of the alternatives.

The primary DEO grant program that the County may qualify for is the Florida Job Growth Grant Fund, an economic development program designed to promote public infrastructure and workforce training across the state. This grant program accepts rolling applications for public infrastructure proposals that will help bring jobs to an area. Infill development in Charlotte County appears to be more residential than commercial, and a capacity issue that may limit growth is currently not an issue. But if improvements/expansion to the drinking water system may incentivize businesses to move into the area, then this grant may be an option. Occasionally, other grant funding is available through DEO, but it is typically tied to economic development, which may not be applicable in this case.

Other grant opportunities may either be available through FDEP or facilitated by FDEP. The County should sign up for the FDEP e-mail listserv; new grants programs and deadlines are announced throughout the year. AWS funding is also available, and applications are submitted through local water management districts. County reclaimed water projects may also be eligible for a FDEP State Water-quality Assistance Grant (SWAG), a program which combines both the Federal Clean Water Act Section 319(h) grants and the former Total Maximum Daily Load (TMDL) grant program into one unit that provides financial assistance to Florida's local governments, including county and municipal governments, for control of water pollution from nonpoint sources.

DPR projects may qualify for FDEP's Innovative Technology Grants program, which aims to combat algal blooms and nutrient enrichment, restore and preserve Florida waterbodies, and implement certain water quality treatment technologies.

FDEP periodically facilitates FEMA funding through the Hazard Mitigation Grant Program (HMGP) in response to Presidential-declared disasters; when available, this is a valuable funding source that can be used for a variety of project types. Outside disaster response, FDEM offers Pre-Disaster Mitigation (PDM) grants for generators and/or resilient infrastructure. If those benefits can be included in system upgrades, this is another funding source that the County may qualify for and apply to any of the alternatives.

On the federal funding side, the American Rescue Plan Act of 2021 (ARPA) is a funding source to support urgent COVID-19 response efforts to control the spread of the virus, replace lost public sector revenue, support economic stabilization for the country, and address necessary investments in water, sewer, stormwater, and broadband infrastructure. Funding is dispersed directly to government entities. Expenditure of these funds and the associated documentation is guided by the US Treasury's Interim Final Rule and includes infrastructure improvements that have no specific set of qualifications. This funding source is an excellent opportunity for the County to reduce the financial impact on utility customers regarding systemwide improvements presented in this report and other utility system improvements. Additional federal funding is also provided through the recently passed Infrastructure Bill and will be facilitated by FDEP. Charlotte County has already been

allocated $36,693,553 through the grant program and has ongoing plans to expend all by December 31, 2026.

10.1.2 Legislative Appropriation

The Florida Legislature can and does appropriate funds for specific projects. The Florida House of Representatives and Florida Senate approach appropriations differently and the rules can change. Meeting with State Representatives and Senators to explore/promote the chosen alternative is prudent. The County likely has government affairs staff and consultants who would engage with water utility staff to assess, define, and promote the expansion. That effort is not presented here. House Rule 5.14 and Joint Rule 2.2 provide the full definition of what constitutes an Appropriations Project. Local water projects are included as an Appropriations Project.

10.1.3 State-Appropriated Funds

The State Legislature and Governor's Office have had significant interest in water quality improvements and reducing surface water discharges. Significant action in support of reclaimed water was taken during the 2021 Legislative Session with the passing of Senate Bill 64, which was subsequently approved by the Governor in June 2021. The Bill highlights the State's commitment toward AWS technologies and requires counties, municipalities, and special districts to provide incentives for the implementation of such technologies. This type of funding is best suited for DPR projects.

Legislative appropriations will continue to be an important source of funding for reclaimed water expansion projects and should be considered annually when CCU is planning to move forward with CIPs. Legislative appropriation requests must be submitted to the House and the Senate for consideration. New forms are released each year and are typically due at least 30 days before the start of Session; early submission is strongly recommended.

10.1.4 Loan Funding Options

Loan funding qualifications are less limited than grant funding opportunities. The primary government loan opportunity available to the County for WTP upgrades is the Florida Drinking Water State Revolving Fund (DWSRF) Program, which provides low-interest loans to eligible entities for planning, designing, and constructing public water facilities. DWSRF has a rolling application cycle beginning in August that is evaluated quarterly and awarded based on funding availability Funding is available for planning, design, and construction, and the loan terms include a 20-year amortization and relatively low interest rates. The federal government has significantly increased DWSRF funding in the 2022 Bipartisan Infrastructure Law, which may improve the County's chances of receiving a DWSRF loan.

Projects that are eligible for the DWSRF are also eligible for funding through the Water Infrastructure Finance and Innovation Act (WIFIA) administered through EPA. The minimum project size for large communities is $20 million and up to 49 percent of the eligible project costs can be funded through WIFIA. The final maturity date of the loan is 35 years from substantial completion, and the interest rate will be equal to or greater than the US Treasury rate of a similar maturity at the date of closing. Any alternative may be funded through DWSRF and WIFIA, and no one alternative is better suited for these kinds of loans.

Like the DWSRF program, FDEP administers the Clean Water State Revolving Fund (CWSRF) loan program dedicated to financing public sewer utility infrastructure projects. The current level of interest is almost cost free; however, the CWSRF loan repayment terms are typically limited to 20 years or less. Reclaimed water falls into the category of utility infrastructure projects and was recommended for the County in the *CCU 2022 Reclaimed Water Master Plan* (Jones Edmunds, 2022). This low-interest loan option may be a good fit for increasing water supply through DPR projects.

10.1.5 Revenue Bonds Options

Revenue bonds are another local funding option that the County may exercise. A revenue bond is a category of municipal bonds supported by revenue from a specific project, a way of financing income-producing projects supported by a specified revenue source. In this case, the County would issue a utility revenue bond (also known as an *essential services bond*); this is a municipal debt security in which the bond is secured by the County and then is repaid from known/pledged revenue from the water utility rather than a general tax fund. Public utilities typically issue tax-exempt revenue bonds that provide tax savings for investors. The interest rate on revenue bonds is currently in the 4.0- to 4.5-percent range, depending on the issuer's credit rating, bond maturity structure, economic conditions, and other factors. Since this interest rate is substantially higher than SRF loans, the advantage to revenue bonds is the repayment structure can be tailored to meet CCU's short- and long-term needs and existing debt repayment structure.

10.1.6 Taxes and Rate Increases

Additional non-grant and non-loan funding opportunities are available at the local level. A local option sales tax is an initiative that can be passed through referendum with a specific focus on infrastructure improvements in accordance with Section 212.055 of the Florida Statute. The surtax is limited to a maximum of 1 percent, but based on the population of Charlotte County, even a small tax increase like 0.5 cent could produce significant revenue through residents and visitors or snowbirds. Such funding is also typically approved in discrete time intervals and can be targeted toward a specific project. The County could implement a Municipal Services Taxing Unit (MSTU) in the service area. MSTUs are taxing units funded by ad valorem taxes (based on property values). If such a program is determined to be feasible within the specific utility service area, it could be limited to only planning and design efforts or to construction-only efforts and could also be limited in duration.

Planning user rate increases is another option. As mentioned above, a review of rates to assess revenue sufficiency should be considered as improvements proceed. Rate increases would provide funding for the proposed improvements from the existing customers and new water customers. Taxes and rate increases are not project dependent and may be used for any alternative CCU intends to pursue.

10.1.7 MSBU and Utility Extension

Another option for funding reclaimed water projects is to use Municipal Service Benefit Units (MSBUs) or utility extensions. Counties typically will establish MSBUs if special assessments apply to only portions of the county area. Because of the localized nature of the costs and benefits of utility infrastructure installation, local governing bodies often impose special

assessments on the property and typically collect such assessments through the annual tax bill administered through the tax collector's office. The procedure for imposing special assessments in Florida are set forth in Chapter 197, FS. In addition to public hearing, notification, and other procedural matters, special assessments imposed on a property must meet a two-pronged test: 1) the property must receive a special benefit from the improvement and 2) the costs of such improvements must be fairly and reasonably apportioned among benefitting properties.

The MSBU/assessment approach is the traditional method of recovering costs for infrastructure projects. The advantage to this approach is that it involves an established collection procedure through the local tax collector. Since taxes have the highest priority of payment relative to liens and other claims, the collection rate is significantly high. Offsetting these benefits are the administrative costs of administering the program, developing assessment resolutions, public hearings, etc. Statutory early-pay discounts of up to 4 percent to property owners are available and need to be built into the assessment calculation so that revenues adequately fund the extension program.

The utility extension/lien program does not require the same level of administrative burden compared to the MSBU/assessment approach. However, the administrative and collection burden under the extension shifts to CCU. The collection enforcement of a separate monthly bill to the property owner is not as sure as the tax bill. CCU may be able to enforce payment through a combination of a lien and cut off of the water service. However, the ability to disconnect service for non-payment of financed connection fee is a legal question beyond the scope of this study.

Appendices

Appendix A

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Appendix B

Fire Hydrant Spatial Analysis Results

Residential Properties – Nearest Fire Hydrant Greater Than 750 Feet Away

Item	Nearest Fire Hydrant (GIS ID)	Distance to Nearest Fire Hydrant (feet)	Address
1	2892	1350	20 CORY ST
2	5971	1313	12639 CHANCELLOR BLVD
3	5971	1281	28 CORY ST
4	2892	1275	10 CORY ST
5	8729	1243	235 MACARTHUR DR
6	4146	1233	243 MACARTHUR DR
7	5971	1201	36 CORY ST
8	5971	1154	39 CORY ST
9	4146	1153	251 MACARTHUR DR
10	4147	1150	244 MACARTHUR DR
11	8729	1127	219 MACARTHUR DR
12	12082	1127	24533 NOVA LN
13	5971	1121	44 CORY ST
14	8729	1098	22425 FORTUNE AVE
15	4147	1076	252 MACARTHUR DR
16	4146	1073	259 MACARTHUR DR
17	11882	1017	3400 ETHLYN LN
18	12082	1015	24581 NOVA LN
19	2907	1009	4 GULL CT
20	864	1002	15 BLUE HEN DR
21	2989	995	12575 PLACIDA RD
22	2085	990	352 BONSELL LN
23	2553	967	15130 REBECCA AVE
24	3036	962	4399 CALLAWAY ST
25	5971	961	60 CORY ST
26	128	960	3405 HOMESTEAD RD
27	1590	943	4129 COLLINGSWOOD BLVD
28	7910	943	1350 QUANTICO ST
29	3066	927	13212 FELDSPAR AVE
30	128	920	3650 BAHAMA DR
31	4146	914	271 MACARTHUR DR
32	2536	899	1133 LOTUS ST
33	2099	883	12102 CHANCELLOR BLVD
34	5971	881	68 CORY ST
35	11882	878	3420 ETHLYN LN
36	315	861	15416 HENNIPEN CIR
37	2536	858	1148 LOTUS ST
38	3036	850	4440 CALLAWAY ST
39	899	849	11 TEE VIEW PL
40	864	846	19 BLUE HEN DR
41	3938	842	23372 OLEAN BLVD
42	7910	839	13096 EISENHOWER DR
43	8828	836	22354 SEYBURN TER
44	4146	835	277 MACARTHUR DR

Item	Nearest Fire Hydrant (GIS ID)	Distance to Nearest Fire Hydrant (feet)	Address
45	5970	830	434 LAKEWOOD LN
46	1501	828	3156 CODY ST
47	29136	827	9751 EAGLE PRESERVE DR
48	306	825	15160 LAKELAND CIR
49	2907	821	6 PHEASANT LN
50	15913	815	22338 SEYBURN TER
51	848	815	19 PHEASANT LN
52	2844	809	2460 SISTINA ST
53	4530	808	3064 SARGEANT ST
54	2553	807	15114 REBECCA AVE
55	4745	804	12118 CHANCELLOR BLVD
56	2099	803	12094 CHANCELLOR BLVD
57	4147	800	22395 CLEVELAND AVE
58	3938	797	23364 ROUNTREE AVE
59	2620	794	2470 SISTINA ST
60	1536	793	3369 PELLAM BLVD
61	3833	792	137 CREEK DR
62	3938	791	23355 ROUNTREE AVE
63	3036	789	12039 DIVERSEY AVE
64	3091	789	5487 BRUSSELS TER
65	1504	787	3361 PELLAM BLVD
66	909	787	15 TEE VIEW PL
67	1504	787	3345 PELLAM BLVD
68	3121	784	4448 CALLAWAY ST
69	7910	782	13285 IRWIN DR
70	908	776	1165 BOUNDARY BLVD
71	128	774	3641 BAHAMA DR
72	3938	773	23361 OLEAN BLVD
73	2844	772	2467 BALTIC AVE
74	1509	769	3329 PELLAM BLVD
75	1079	768	254 ARLINGTON DR
76	3957	767	23380 OLEAN BLVD
77	5970	764	442 LAKEWOOD LN
78	3938	762	23364 OLEAN BLVD
79	2857	760	473 SKYLARK LN
80	4530	760	18247 TEMPLE AVE
81	2510	756	16166 ARCARO AVE
82	4146	756	283 MACARTHUR DR
83	6096	756	13213 FELDSPAR AVE
84	11882	753	3455 HOMESTEAD RD
85	3677	753	3466 SWANEE RD
86	4721	751	134 CREEK DR
87	2325	750	21553 OLEAN BLVD

Commercial Properties – Nearest Fire Hydrant Greater Than 500 Feet Away

Item	Nearest Fire Hydrant (GIS ID)	Distance to Nearest Fire Hydrant (feet)	Address
1	165	512.697	23900 VETERANS BLVD
2	4745	501.0581	12150 CHANCELLOR BLVD
3	11882	520.8539	3784 CAPE HAZE DR
4	2989	691.0696	6401 BOCA GRANDE CSWY
5	843	737.4763	28 MISTLETOE LN
6	2989	983.5415	—
7	1211	712.3992	10640 LEMON CREEK LOOP - BLDG A3 - UNIT 104
8	1211	582.6373	8541 AMBERJACK CIR - BLDG C1 – UNIT 103
9	1211	613.0419	10620 LEMON CREEK LOOP - BLDG A2 - UNIT 102
10	31937	717.888	10640 LEMON CREEK LOOP - BLDG A3 - UNIT 102
11	1211	600.429	8541 AMBERJACK CIR - BLDG C1 – UNIT 402
12	1211	554.1561	8541 AMBERJACK CIR - BLDG C1 – UNIT 102
13	1211	584.0817	10620 LEMON CREEK LOOP - BLDG A2 - UNIT 103
14	31937	727.7827	10640 LEMON CREEK LOOP - BLDG A3 - UNIT 103
15	1211	554.1269	10620 LEMON CREEK LOOP - BLDG A2 - UNIT 104
16	1211	539.0644	8541 AMBERJACK CIR - BLDG C1 – UNIT 101
17	1198	705.1601	10640 LEMON CREEK LOOP - BLDG A3 - UNIT 101
18	1211	642.006	10620 LEMON CREEK LOOP - BLDG A2 - UNIT 101

Appendix C

Water Service Providers

CHARLOTTE COUNTY WATER SERVICE PROVIDERS

Water service providers refers to the utilities, municipalities, associations, authorities, and districts within Charlotte County that serve potable water service to its residents. Water service providers can be public or privately owned and are typically regulated by governmental authorities such as FDEP and FDOH to provide oversight and protect the public health. Charlotte County is under FPSC's jurisdiction, which also requires private utilities within the County to be certificated by the FBSC to operate, manage, and control a system. Public utilities have established service areas, whereas private utilities have certificated areas granted by the FPSC. Supplying potable water to Charlotte County residents is currently performed by three public and 11 private water service providers.

The following sections review the various water service providers within Charlotte County and include a summary of available assets. The information was obtained from numerous sources including WUPs, FDEP MORs, Sanitary Surveys, and water-service provider websites and various reports. The service areas for each water service provider were obtained from CCU's *Utility Map Book*.

MID COUNTY

CHARLOTTE HARBOR WATER ASSOCIATION

The Charlotte Harbor Water Association (PWS ID 6080044) certificated area covers approximately 6,032 acres northwest of the Peace River in Charlotte County. The association has approximately 1,675 service connections and serves a population of 4,500 people. The Association draws their raw water from three production wells. The treatment process includes hypo-chlorination disinfection, conventional degasification, and reverse osmosis. The system includes one GST, one elevated tank, and two 40-hp HSPs. Consolidation of the CWHA may not require additional infrastructure to be connected to Port Charlotte Water System as the systems currently have two emergency interconnects and the CHWA maintains its own water supply and treatment facilities.

RIVERWOOD COMMUNITY DEVELOPMENT DISTRICT

The Riverwood Community Development District (PWS ID 5084111) certificated area covers approximately 1,362 acres off the Myakka River and southwest of Port Charlotte, along SR-776, serving 1,400 ERCs. Riverwood's distribution system consists of 8-inch pipes that supply potable water to a population of 2,133 and 853 service connections in the Riverwood development. Riverwood does not own or operate either a water supply or WTP but purchases bulk treated water from CCU to supply its customers. Consolidation of this utility would not require additional transmission system infrastructure as the systems are already connected and served by CCU via a metered connection.

EL JOBEAN WATER ASSOCIATION

The El Jobean Water Association (PWS ID 6080081) certificated area covers approximately 438 acres east of the Myakka River along SR-776, southwest of Port Charlotte, serving approximately 775 ERCs. The Association supplies potable water to a population of 1,338 with 600 service connections. The Association does not own or operate either a water supply

or WTP but purchases treated water in bulk from CCU. Consolidation of this utility would not require additional transmission system infrastructure as the systems are already connected and served by CCU via a metered connection.

NHC Utilities (Encore Super Park)

NHC Utilities (PWS ID 5084110) certificated area covers approximately 83 acres west of SR-776, southwest of Port Charlotte. NHC presently serves nearly 609 ERCs within the Encore Super Park manufactured home park with a permitted capacity of 0.09 MGD. This certificated area includes a population of 401 and has 200 service connections. The utility does not own or operate either a water supply or WTP but purchases treated water in bulk from CCU. Consolidation of this utility would not require additional transmission system infrastructure as the systems are already connected.

DeSoto County Utilities

DeSoto County Utilities (PWS ID 6144898) does not have a certificated area in Charlotte County but serves an area of approximately 26 acres in north-central Charlotte County, west of Kings Highway, along the DeSoto County line. The bulk of this utility's service area is in DeSoto County. The utility serves approximately 42 residential service connections in Charlotte County and does not own or operate either a water supply or WTP of its own but purchases bulk treated water from PRMRWSA. Since this is already a member of the PRMRWSA, it is not expected to be acquired by CCU.

West County

Englewood Water District

Englewood Water District (PWS ID 6580531) does not have a certificated area in Charlotte County but covers approximately 6223 acres that is in south Sarasota County and west Charlotte County. The District has approximately 18,461 service connections. Englewood receives their water from four freshwater wellfields and two brackish water wellfields. The freshwater is sent to a lime softening plant while the brackish water is sent to a reverse osmosis plant. The District approaches potable water treatment with the use of chloramine injection (chlorine/ammonia solution) for disinfection rather than conventional chlorine disinfection. Consolidation of this water district would require extensive modeling or infrastructure to be connected to the Port Charlotte Water System as the existing interconnect is flow limited and primarily used for emergency purposes.

Bocilla Utilities

Bocilla Utilities (PWS ID 6084079) is a privately owned utility that was established in 1985. The Bocilla Utilities serves all of Don Pedro Island, a bridgeless barrier island. The certificated area covers approximately 525 acres, serving over 375 ERCs. Within this certificated area is a population of 1,062 and 204 service connections with a permitted capacity of 0.12 MGD. The utility does not own or operate either a water supply or WTP, rather is considered a consecutive system that purchases bulk treated water from the Englewood Water District. It has an interconnect with Knight Island Utilities through which it delivers water purchased from Englewood Water District. Consolidation of this utility would require the installation of a transmission main under Lemon Bay, which likely would be completed near Panama Boulevard, or using the existing Englewood Water District

connection. Based on discussions with CCU staff, Bocilla Utilities is unlikely to be served by CCU in the future as the connection to Englewood Water District was recently completed.

Knight Island Utilities

The Knight Island Utilities (PWS ID 6084075) certificated area covers approximately 545 acres on the bridgeless barrier islands of Knight Island and Thornton Key, serving over 260 ERCs. The utilities distribution system consists of 6-inch pipes that supply potable water to a population of 431 and has 201 service connections with a permitted capacity of 0.09 MGD. The utility does not own or operate either a water supply or WTP but purchases bulk treated water from Englewood Water District, which is delivered through an interconnect with Bocilla Utilities. As such, consolidation of this utility would only be considered if Bocilla Utilities were connected to the CCU system or if the area north of Stump Pass were provided CCU water service.

Little Gasparilla Island Utilities

The Little Gasparilla Island Utilities (PWS ID 6080175) certificated area covers approximately 282 acres on Little Gasparilla Island, a bridgeless barrier island. The utilities presently serve a population of 450 and has 220 service connections. The utility does not own or operate either a water supply or WTP, purchasing bulk treated water from the County. Consolidating this utility does not require extensive modeling or infrastructure as it is currently a bulk user.

Gasparilla Island Water Association

The Gasparilla Island Water Association (GIWA) (PWS ID 6080104) certificated area covers approximately 973 acres in Charlotte and Lee Counties, mostly on Gasparilla Island, a barrier island in southwest Charlotte County. Approximately 1.22 square miles of the certificated area is in Charlotte County. GIWA operates a RO WTP, wellfield, and color removal plant, southeast of Rotonda in Charlotte County, with a combined permitted capacity of 1.84 MGD providing service to nearly 2,200 ERCs in both Lee and Charlotte Counties. GIWA draws groundwater from the Intermediate Aquifer via 44 production wells. The treatment processes in use consist of aeration, disinfection, and filtration. The system consists of five operational potable water GSTs, ranging in capacity from 0.125 to 2.0 MG, for a total capacity of 3.875 MG. The system also consists of 6 HSPs ranging from 50 hp to 100 hp. Water is supplied to a population of 5,562 with 1,670 service connections, approximately 33 percent of which are in Charlotte County. CCU maintains a 6-inch emergency interconnect with GIWA. Consolidating this system is not expected to require extensive modeling or infrastructure to be connected if the GIWA assets are maintained.

South County

City of Punta Gorda

The City of Punta Gorda (PWS ID 6080051) does not have a certificated area in Charlotte County but covers approximately 23867 acres that is in Charlotte County. Punta Gorda has 12,817 service connections and serves a population of 36,302. The City of Punta Gorda draws groundwater from six wells and draws surface water from Shell Creek. The treatment processes used here consists of hypo-chlorination disinfection, conventional degasification, chemical coagulation, reverse osmosis, and gravity filtration. The system has five GSTs, two

clearwell tanks, one elevated storage tank, two 200-hp transfer pumps, one 100-hp transfer pump, one 200-hp HSP, and four other pumps used for flocculation. Consolidating this system may require extensive modeling or infrastructure to be connected to the Burnt Store Water System.

Florida Governmental Utility Authority – North Fort Myers

The Florida Governmental Utility Authority (PWS ID 5360172) North Fort Myers branch currently serves a small area within Charlotte County approximately 1,507 acres immediately north of the Lee County line in South County, east of Tamiami Trail and west of I-75. FGUA does not currently have any residential or commercial service connections in Charlotte County but serves nearly 1,900 residential customers in Lee County. FGUA has been permitted to serve the area within Charlotte County as CCU has not extended water service to the area. FGUA purchases bulk water from Lee County Utilities to serve a portion of its Lee County customer base and the remainder is served by Lake Fairways WTP. The Authority draws groundwater from two production wells. The treatment processes in use consist of aeration and disinfection. The system consists of one 150,000-gallon GST, one 10,000-gallon hydro pneumatic tank, one 40-hp propane HSP, and two 40-hp electric HSPs. Since the majority of the customers are in Lee County as well as the WTP, consolidation of this system would likely be completed by Lee County utilities.

Town and Country Utilities/Babcock Ranch Community Independent Special District

The Town & Country Utilities (PWS ID 5084116) certificated area covers approximately 13,421 acres north of Lee County Road 78, east of SR-31, and south of Charlotte County Road 74 in Charlotte and Lee Counties, with approximately 21.30 square miles in Charlotte County. The utility operates a RO WTP and wellfield in southeastern Charlotte County, with a current permitted capacity of 0.250 MGD that provides service to over 1,500 ERCs. The utility draws groundwater from the Upper Floridan Aquifer at 3 production wells. The treatment processes used are disinfection, membrane treatment, and degasification. The system also consists of four HSPs with a capacity of 694 MGD and a 1-MG GST. Water is supplied to a population of 804 with a total of 2,251 service connections.

The utility has been certified to serve the Babcock Ranch development, and its potable water capacity will expand as the community develops. The utility has received a Water Use Permit for an annual allocation of 282.84 MG and expects to expand its WTP to a capacity of 6.00 MGD by 2031. Consolidation of this utility would be costly due to its size and distance from major CCU mains and interconnects.

East County

Sun River Utilities / North Charlotte Waterworks, Inc

The Sun River Utilities/North Charlotte Waterworks (PWS ID 6084074) certificated area covers approximately 12,397 acres along US 17, near the DeSoto County line, consisting of the Rivers Edge mobile home development and adjoining properties in Charlotte and DeSoto Counties. Sun River Utilities sold the utility assets to North Charlotte Waterworks in February 2016. As of December 31, 2021, the utility served 61 ERCs via approximately 4,770 feet of 6-inch PVC water main. The utility draws groundwater from two 4-inch production wells rated for 72,000 gpd each. The treatment process consists of a 40,000-gpd

RO membrane process and gas chlorination system. The system contains six 5,000-gallon concrete GSTs, one 965-gallon steel tank and two 75-hp high service pumps. In May 2022, the utility submitted a notice of abandonment of the system. Consolidating this utility would be more feasible if CCU had infrastructure with the East County area.

COMMUNITY SYSTEMS

Lake Suzy Utilities (PWS ID 6144856) certificated area covers approximately 858 acres located north of Mid County in Desoto County near I75 and Kings Highway. Recent information was unavailable for this utility. As December 2007, the utility had 303 ERCs with the capacity to serve 805 ERCs and purchased water from Desoto County via an interconnect. Based on a review of historical documents, an application was submitted for acknowledgement of a corporate reorganization and approval of a name change from Lake Suzy Utilities to Aqua Utilities Florida, Inc. in 2008. The system is no longer regulated by PSC nor assigned a PWS ID from FDEP and therefore is assumed to have been acquired by Desoto County.

Tropical Palms MHP (PWS ID 6080324) certificated area covers approximately 50.4 acres in South County east of Tamiami Trail on the border of Charlotte County and Lee County. The utility has approximately 298 service connections. Information about the water source and treatment process at this utility was not available, but it is likely the utility uses groundwater as its primary source. Consolidation of this system to the Burnt Store Water System is possible but would require a large amount of transmission system infrastructure. Based on discussions with CCU staff, it is not likely to be connected to the South County system but would likely be served by the North Fort Myers Utility.

Sun N Shade campground (PWS ID 6080272) certificated area covers approximately 16.2 acres in South County and east of Tamiami Trail. The utility has approximately 232 service connections. Information about the water source and treatment process at this utility was not available, but it is likely the utility uses groundwater as its primary source. Based on the location of the Sun N Shade campground, with a large amount of additional infrastructure the campground can be tied into the Burnt Store Water System or North Fort Myers Utilities.

Shell Creek Park MHP (PWS ID 6080256) certificated area covers approximately 24.8 acres in South County north of Washington Loop Road. The utility has approximately 236 service connections. The primary source of potable water for Shell Creek Park MHP comes from a well on property. Due to the proximity of Sun River Utilities, it is reasonable to tie Shell Creek Park MHP in with additional infrastructure additions.

Pelican Perch RV Park (PWS ID 6080137) certificated area covers approximately 2.1 acres in South County west of Tamiami Trail on the border of Punta Gorda. The utility has approximately 31 service connections. Information about the water source and treatment process at this utility was not available, but it is likely the utility uses groundwater as its primary source. The Burnt Store Water System is within reasonable distance to the Pelican Perch RV Park that with additional infrastructure added it can be tied into that system. A secondary solution would be to tie this RV park into the City of Punta Gorda system.

Paradise Park Condos (PWS ID 6084007) certificated area covers approximately 119.5 acres in East County north of Bermont Road. The utility has approximately 223 service connections. The primary source of potable water for Paradise Park Condos is two wells on the property. To consolidate to provide water to these condos, a substantial amount of infrastructure is needed to tie it into Town and Country Utility Company or a neighboring County.

Charlotte Correctional Institution (PWS ID 5084082) does not have a certificated area in Charlotte County but covers approximately 287.7 acres that is in South County east of I-75. The utility has approximately 45 service connections. The primary source of potable drinking water for the Correctional Institution comes from a well on property. To provide potable water to the correctional institution, it would most likely be tied into the North Fort Myers Utilities.

Alligator Park MHP (PWS ID 6080009) certificated area covers approximately 50.6 acres in South County east of Tamiami Trail and west of I-75. The utility has approximately 401 service connections. Information about the water source and treatment process at this utility was not available, but the utility likely uses groundwater as its primary source. The most reasonable way to consolidate is to tie the Alligator Park MHP into the City of Punta Gorda utilities due to the location of the park.

Appendix D

20-Year Charlotte County Projected Water Demands

Table D-1 Charlotte County Burnt Store Water System 20-Year Projected Flows

Year	AADD (MGD)	Peak Month @ 1.20x (MGD)	Max Day @1.40x (MGD)
2021	0.442	0.53	0.62
2022	0.804	0.97	1.13
2023	1.118	1.34	1.57
2024	1.414	1.70	1.98
2025	1.694	2.03	2.37
2026	1.951	2.34	2.73
2027	2.203	2.64	3.08
2028	2.432	2.92	3.40
2029	2.644	3.17	3.70
2030	2.840	3.41	3.98
2031	3.141	3.77	4.40
2032	3.181	3.82	4.45
2033	3.327	3.99	4.66
2034	3.455	4.15	4.84
2035	3.567	4.28	4.99
2036	3.657	4.39	5.12
2037	3.740	4.49	5.24
2038	3.802	4.56	5.32
2039	3.847	4.62	5.39
2040	3.874	4.65	5.42
2041	3.780	4.54	5.29

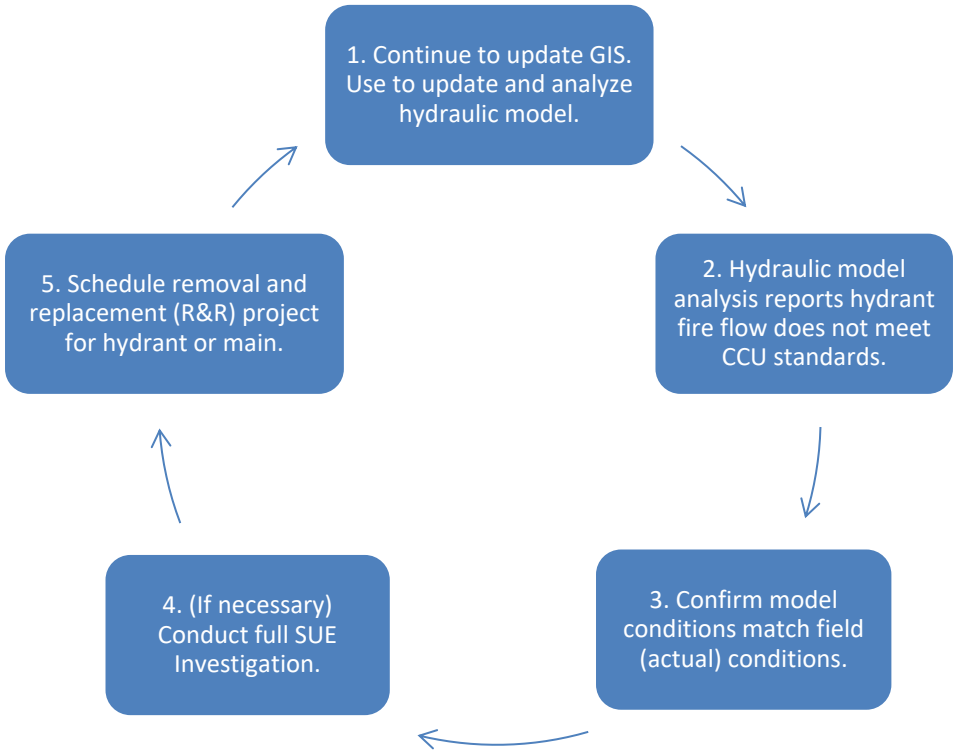
Table D-2 Charlotte County Peace River PWS 20-Year Projected Flows

Year	AADD (MGD)	Peak Month @ 1.20x (MGD)	Max Day @ 1.40x (MGD)
2021	11.42	13.71	15.99
2022	12.20	14.65	17.08
2023	12.98	15.58	18.17
2024	13.76	16.51	19.26
2025	13.85	16.62	19.39
2026	15.31	18.37	21.43
2027	16.08	19.30	22.51
2028	16.86	20.23	23.60
2029	17.63	21.15	24.68
2030	18.02	21.63	25.23
2031	19.17	23.00	26.84
2032	19.93	23.92	27.90
2033	20.70	24.84	28.98
2034	21.47	25.76	30.06
2035	22.35	26.82	31.29
2036	22.99	27.59	32.19
2037	23.75	28.51	33.25
2038	24.52	29.42	34.33
2039	25.27	30.33	35.38
2040	26.79	32.15	37.51
2041	27.10	32.53	40.65

Appendix E

Fire Flow SOP

FIRE FLOW STANDARD OPERATING PROCEDURE



1. Continue to build asset database and update hydraulic model.

- CCU is actively updating its asset database information through record drawing review, discussions with staff, or field reports. The hydraulic model should continue to be updated with the latest asset information, including completed projects, to ensure the model is accurately representing actual system conditions. The model should be re-calibrated as needed using field-observed or SCADA-observed data to compare model results.

2. Use the hydraulic model to analyze fire flow availability against CCU LOS standards.

- System-wide fire flow is analyzed in the hydraulic model by simultaneously simulating available fire flow at all hydrants in the distribution system under MDD conditions. For areas in the model unable to provide adequate fire flow, model conditions should be confirmed with field conditions using updated GIS information and field investigation.

3. Confirm hydraulic model conditions match field conditions.

- Review available record drawings to confirm model depicts accurate local pipe and hydrant main diameters.
    - Field staff may also indicate the hydrant main valve ID tag (typically located on valve box pad) to determine hydrant main sizing.

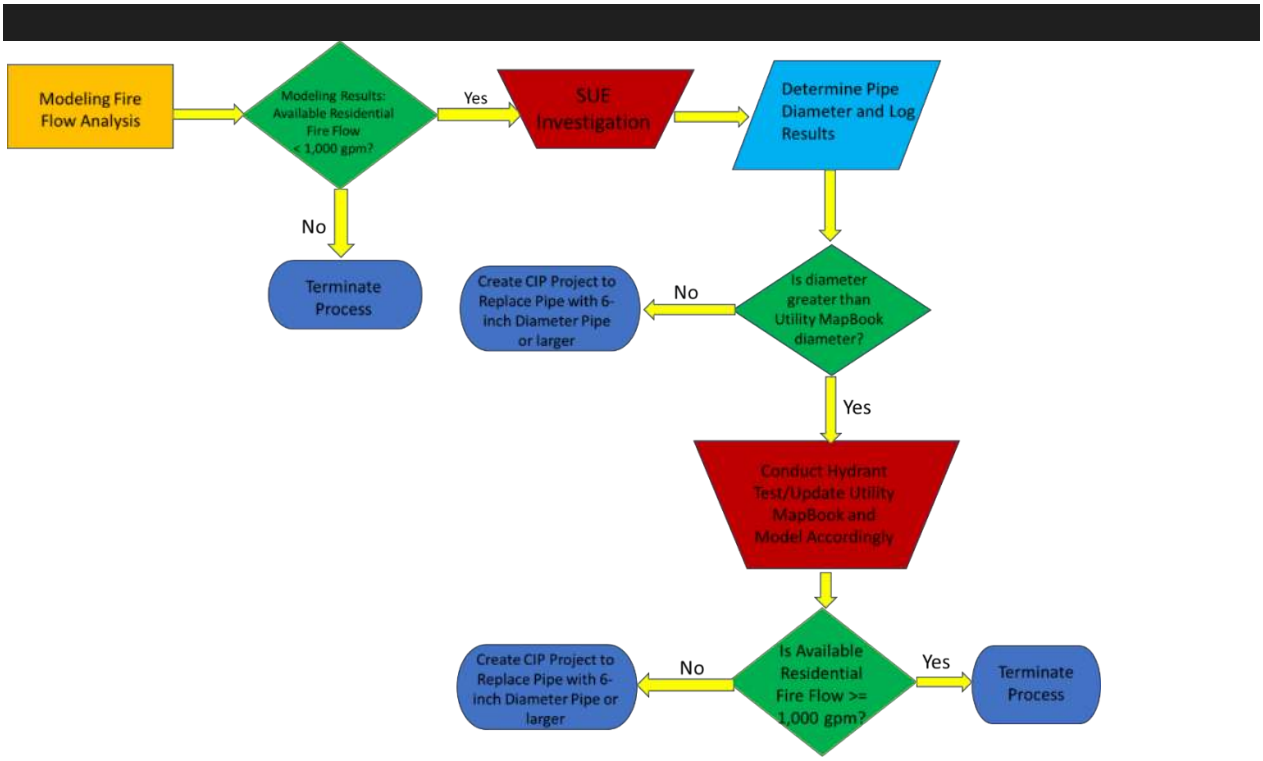
- The hydrant fire flow deficiencies should be verified by field staff. This includes visual inspection of the hydrant, repair and maintenance of the hydrant or local hydrant valve.
    - During this assessment, staff should use this opportunity to verify the hydrant age and other relevant hydrant information stored in GIS/CityWorks.
- If field conditions appear to match model conditions, Field staff may conduct a fire hydrant flow test to determine if further investigation should occur.

4. Conduct full SUE investigation.

- Subsurface Underground Exploration (SUE) is used to verify pipe diameter. Typically, this is accomplished by using ground-penetrating radar (GPR) devices.

5. Complete removal and replacement (R&R) project for hydrant or main.

- CCU should review fire flow results. If it is determined that insufficient fire flow is being provided, hydrant mains or mains local to the hydrant should be scheduled for R&R. If it is determined that hydrants or hydrant features, such as the hydrant valve or opening size, are inadequately sized or in need of replacement due to age or functionality, R&R should be scheduled as well. Work Orders can be developed for all of these assets using CityWorks.



Appendix F

Capital Improvement Projects

Table 9-1 Capital Maintenance and Improvement Projects

Project Type and Projects	Present-2025	2026-2030	2031-2035	2036-2040	2041-2045	Total
CMP - Annually Recurring	**$13,125,000**	**$26,250,000**	**$25,000,000**	**$25,000,000**	**$25,000,000**	**$114,375,000**
CMP-1 - Potable Water Fire Hydrant Installation and Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-2 - Potable Water Connections and Meter Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-3 - Water Usage Monitoring Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-4 - Identification and Replacement of Lead and Galvanized Service Lines Program	$625,000	$1,250,000	$0	$0	$0	$1,875,000
CMP-5 - Predictive, Preventative, and Corrective Maintenance Program	$625,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$5,625,000
CMP-6 - Identification and Replacement of AC Pipe and Undersized Water Mains Program	$10,000,000	$20,000,000	$20,000,000	$20,000,000	$20,000,000	$90,000,000
Reports/Studies	**$3,200,000**	**$150,000**	**$0**	**$500,000**	**$0**	**$3,850,000**
S-WTP-5 - Babcock Ranch Wellfield Groundwater Modeling	$3,000,000	$0	$0	$0	$0	$3,000,000
S-WTP-6 - Babcock Ranch Permit Modification	$200,000	$0	$0	$0	$0	$200,000
S-WTP-4 - BS WTP Capacity Assessment	$0	$150,000	$0	$0	$0	$150,000
S-WTP-7 - Potable Reuse Feasibility Study	$0	$0	$0	$250,000	$0	$250,000
S-WTP-8 - Aquifer Recharge Feasibility Study	$0	$0	$0	$250,000	$0	$250,000
Water Supply	**$6,000,000**	**$185,100,000**	**$87,250,000**	**$84,475,000**	**$72,075,000**	**$434,900,000**
S-WTP-1 - Burnt Store Wellfield Expansion	$6,000,000	$10,000,000	$0	$0	$0	$16,000,000
S-WTP-9 - Babcock Ranch Wellfield Design and Construction	$0	$45,600,000	$22,650,000	$10,625,000	$10,625,000	$89,500,000
S-WTP-10 - Babcock Ranch RO WTP Design and Construction	$0	$55,000,000	$27,400,000	$41,200,000	$41,200,000	$164,800,000
S-WM-19 - Babcock Ranch Raw Water Transmission Main and Booster Station	$0	$38,700,000	$19,300,000	$11,250,000	$11,250,000	$80,500,000
S-WM-21 - Mid County Transmission Main	$0	$23,800,000	$11,900,000	$0	$0	$35,700,000
S-WM-20 - South County Transmission Main	$0	$0	$0	$12,400,000	$0	$12,400,000
M-WBS-11 - Mid County Water Source Blending Station	$0	$12,000,000	$6,000,000	$9,000,000	$9,000,000	$36,000,000
Facilities	**$17,401,000**	**$18,843,000**	**$4,500,000**	**$0**	**$0**	**$40,744,000**
W-WBS-1 - Gulf Cove Pipe Replacement	$218,000	$0	$0	$0	$0	$218,000
W-WBS-2 - Gulf Cove Pumping Upgrade Phase-1	$450,000	$0	$0	$0	$0	$450,000
M-WBS-3 - Walenda Pumping Upgrade Phase-1	$750,000	$0	$0	$0	$0	$750,000
W-WBS-4 - Rotonda Pumping Upgrade Phase-1	$600,000	$0	$0	$0	$0	$600,000
S-WBS-5 - Heritage Landing WBS	$4,500,000	$0	$0	$0	$0	$4,500,000
M-WBS-8 - O'Hara WBS	$2,343,000	$0	$0	$0	$0	$2,343,000
S-EST-1 - Tuckers Grade EST	$4,000,000	$0	$0	$0	$0	$4,000,000
S-WTP-3 - BS WTP RO Process Improvements	$540,000	$0	$0	$0	$0	$540,000
W-WBS-9 - Gulf Cove Upgrade Phase-2	$4,000,000	$3,000,000	$0	$0	$0	$7,000,000
M-WBS-6 - Walenda Upgrade Phase-2	$0	$6,000,000	$0	$0	$0	$6,000,000
W-WBS-7 - Rotonda Upgrade Phase-2	$0	$7,500,000	$0	$0	$0	$7,500,000
W-WBS-10 - Robin Road WBS	$0	$2,343,000	$0	$0	$0	$2,343,000
S-WTP-2 - Burnt Store WTP Pumping Upgrade	$0	$0	$4,500,000	$0	$0	$4,500,000
Pipeline	**$43,068,000**	**$33,438,000**	**$11,758,000**	**$17,717,000**	**$0**	**$105,981,000**
M-WM-1 - CCU-PRMRWSA Phase IIB Expansion	$37,500,000	$0	$0	$0	$0	$37,500,000
S-WM-5 - Shotgun Road	$1,664,000	$0	$0	$0	$0	$1,664,000
M-WM-6 - Sherbourne Street	$3,054,000	$0	$0	$0	$0	$3,054,000
S-WM-4 - Green Gulf Blvd	$850,000	$1,800,000	$0	$0	$0	$2,650,000
M-WM-3 - Toledo Blade Blvd	$0	$820,000	$0	$0	$0	$820,000
W-WM-7 - Rotonda Blvd North	$0	$25,538,000	$0	$0	$0	$25,538,000
S-WM-14 - South Green Gulf Blvd	$0	$880,000	$0	$0	$0	$880,000
M-WM-18 - Rio De Janeiro	$0	$1,350,000	$0	$0	$0	$1,350,000
S-WM-2 - Tuckers Grade	$0	$2,250,000	$2,250,000	$0	$0	$4,500,000
S-WM-13 - Los Lomas Drive	$0	$800,000	$2,850,000	$0	$0	$3,650,000
W-WM-0 - McCall Road Transmission Main Upgrade	$0	$0	$224,000	$0	$0	$224,000
W-WM-8 - Wilmington Blvd	$0	$0	$2,402,000	$0	$0	$2,402,000
M-WM-10 - Melbourne Crossing	$0	$0	$63,000	$0	$0	$63,000
M-WM-11 - Ayrshire Crossing	$0	$0	$162,000	$0	$0	$162,000
W-WM-12 - Santa Cruz Crossing	$0	$0	$247,000	$0	$0	$247,000
S-WM-15 - Jones Loop	$0	$0	$3,500,000	$0	$0	$3,500,000
M-WM-22 - Posadas Circle Loop	$0	$0	$60,000	$0	$0	$60,000
W-WM-9 - Gulfstream Blvd	$0	$0	$0	$2,750,000	$0	$2,750,000
S-WM-16 - Zemel Road	$0	$0	$0	$6,592,000	$0	$6,592,000
S-WM-17 - Tamiami Trail	$0	$0	$0	$8,375,000	$0	$8,375,000
Grand Total	**$82,794,000**	**$263,781,000**	**$128,508,000**	**$127,692,000**	**$97,075,000**	**$699,850,000**
CIP Alternatives						
M-WTP-0 – Increase PRMRWSA Allocation	TBD	TBD	TBD	TBD	TBD	$196,800,000

Reports/Studies

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-5 - Babcock Ranch Wellfield Groundwater Modeling

Related CIP: S-WTP-6 | **Project Area Served:** Mid/South County

Description: Conduct additional hydrogeological investigations for the Babcock Ranch water supply. This project will be used to confirm the safe yield of groundwater withdrawals from the currently permitted Babcock Ranch Wellfield. It may also include additional test well installation at the Babcock Ranch Wellfield for permitting purposes.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
No

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
East County

Project Type
Water Treatment

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☑ Report / Study

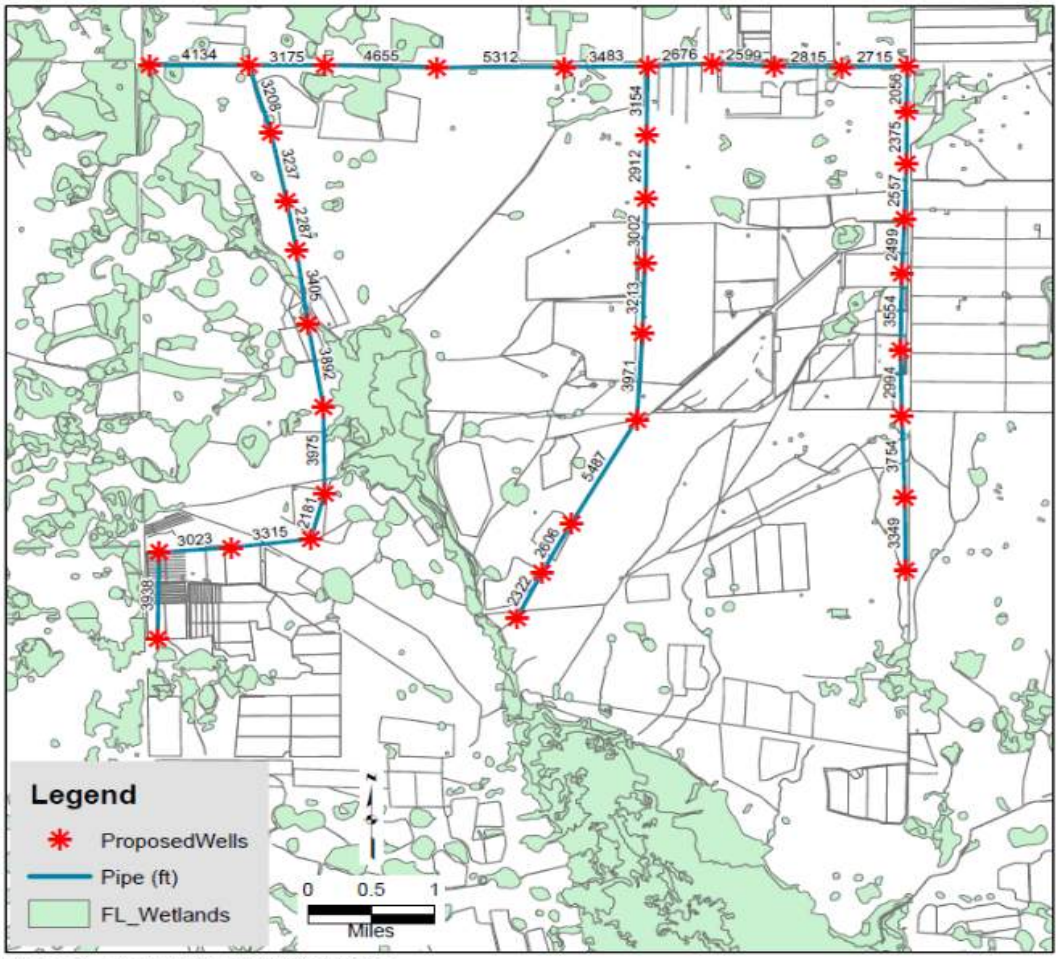


Figure 1. Conceptual Wellfield Map

Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	1,500	1,500	-	3,000
Internal Costs				
Construction Cost	-	-	-	
Other Fees and Costs				
Total Project Cost	**1,500**	**1,500**	**-**	**3,000**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-6 - Babcock Ranch Permit Modification

Related CIP: S-WTP-5 | **Project Area Served:** Mid/South County

Description: Re-open and renew existing secondary use WUP as a primary use WUP to meet water supply needs through 2045, subject to results of the Babcock Ranch Groundwater Modeling project recommended herein.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
East County

Project Type
Water Supply Study

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☑ Report / Study

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
WATER USE PERMIT NO. 08-00129-W
NON-ASSIGNABLE

Date Issued: December 19, 2011 **Expiration Date:** December 19, 2031

Authorizing: THE NEW USE OF GROUND WATER FROM THE UPPER FLORIDAN AQUIFER FOR A SECONDARY PUBLIC WATER SUPPLY WITH A MAXIMUM-MONTHLY ALLOCATION OF 93 MILLION GALLONS AND AN ANNUAL ALLOCATION OF 372 MILLION GALLONS.

Located In: Charlotte County, S3,10,12,14,15/T41S/R26E

Issued To: CHARLOTTE COUNTY UTILITIES
(CHARLOTTE COUNTY PWS/BABCOCK RANCH WELLFIELD)
25550 HARBOR VIEW ROAD UNIT 1,
PORT CHARLOTTE, FL 33980

This Permit is issued pursuant to Application No. 071101-3, dated November 1, 2007, for the use of water as specified above and subject to the Special Conditions set forth below. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, maintenance or use of activities authorized by this permit. Said application, including all plans and specifications attached thereto, is by reference made a part here of.

Upon written notice to permittee, this permit may be temporarily modified, or restricted under a Declaration of Water Shortage or a Declaration of Emergency due to Water Shortage in accordance with provisions of Chapter 373, Fla. Statutes, and applicabie rules and regulations of the South Florida Water Management District.

This Permit may be permanently or temporarily revoked, in whole or in part, for the violation of the conditions of the permit or for the violation of any provision of the Water Resources Act and regulations thereunder.

This Permit does not convey to the permittee any property rights nor any privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation, or requirement affecting the rights of other bodies or agencies.

LIMITING CONDITIONS ARE AS FOLLOWS:
SEE PAGES 2 - 5 OF 5 (27 LIMITING CONDITIONS)

SOUTH FLORIDA MANAGEMENT
DISTRICT, BY ITS EXECUTIVE DIRECTOR

On _____

By _____
DEPUTY CLERK
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PAGE 1 OF 5

Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	-	100	100	200
Internal Costs				
Construction Cost		-	-	
Other Fees and Costs				
Total Project Cost		**100**	**100**	**200**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-4 - BS WTP Capacity Assessment

Related CIP: None | **Project Area Served:** South County

Description: Conduct a capacity analysis for the Burnt Store RO WTP.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
No

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☐ Replace
- ☐ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Burnt Store RO WTP

Project Type
Water Treatment

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☑ Report / Study

Expenditure Plan ($1000)

	2027	2028	2029	2030	Total
Professional Services	- 75	75			150
Internal Costs					
Construction Cost	-	-			
Other Fees and Costs					
Total Project Cost	**75**	**75**			**150**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-7 - Potable Reuse Feasibility Study

Related CIP: None | **Project Area Served:** South County

Description: Conduct a feasibility study for potable reuse at the Burnt Store WRF.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
No

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
South County

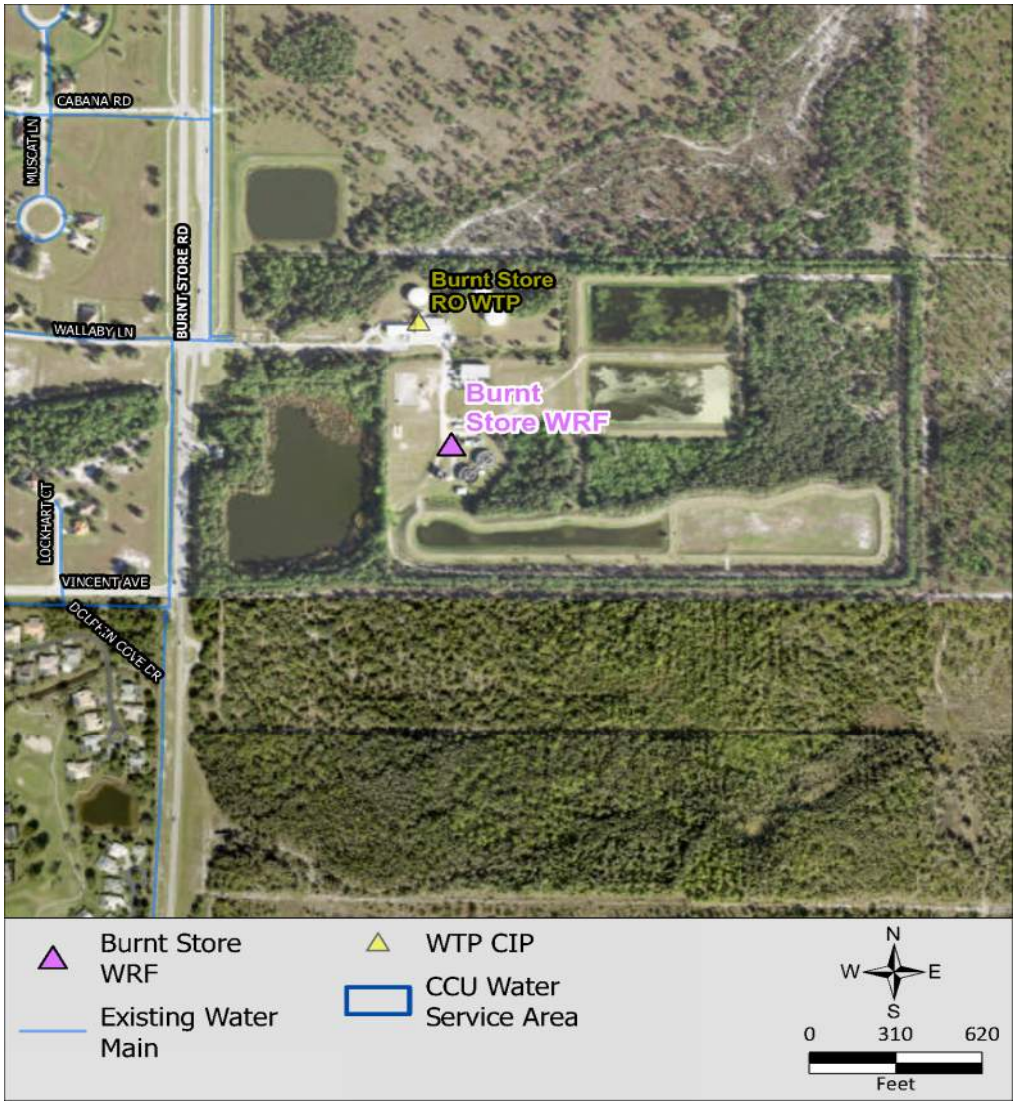
Project Type
Water Supply Study

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☑ Report / Study



Expenditure Plan ($1000)

	2037	2038	2039	2040	Total
Professional Services -	125	125			250
Internal Costs					
Construction Cost	-	-			
Other Fees and Costs					
Total Project Cost	**125**	**125**			**250**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-8 - Aquifer Recharge Feasibility Study

Related CIP: None | **Project Area Served:** South County

Description: Assess the viability of aquifer recharge (Class V) at the Burnt Store WRFs to increase the resilience of the Burnt Store wellfield.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
No

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
South County

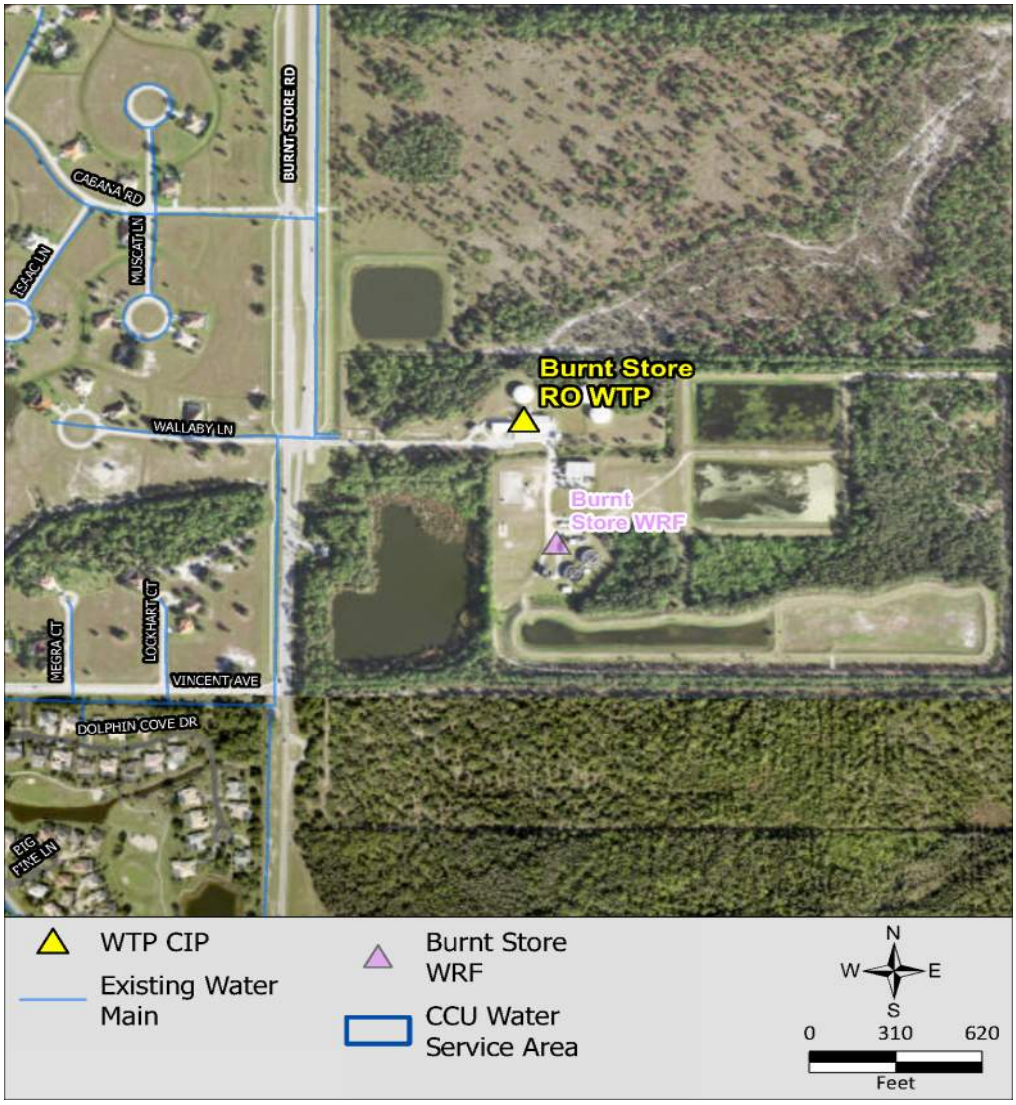
Project Type
Water Supply Study

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☑ Report / Study



Expenditure Plan ($1000)

	2036	2037	2038	2039	Total
Professional Services	125	125			250
Internal Costs					
Construction Cost	-	-			
Other Fees and Costs					
Total Project Cost	**125**	**125**			**250**

(Costs expressed in 2023 dollars)

Water Supply Projects

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-1 - Burnt Store Wellfield Expansion

Related CIP: None | **Project Area Served:** South County

Description: Increase the capacity of the South County wellfield by installing four additional 12-inch diameter wells along Zemel Road. An 18-inch raw water main is currently installed along Burnt Store Road. Approximately 25,000 LF of new raw water main will need to be installed along Zemel Road from Burnt Store Road up to the proposed wellfield expansion.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
South County

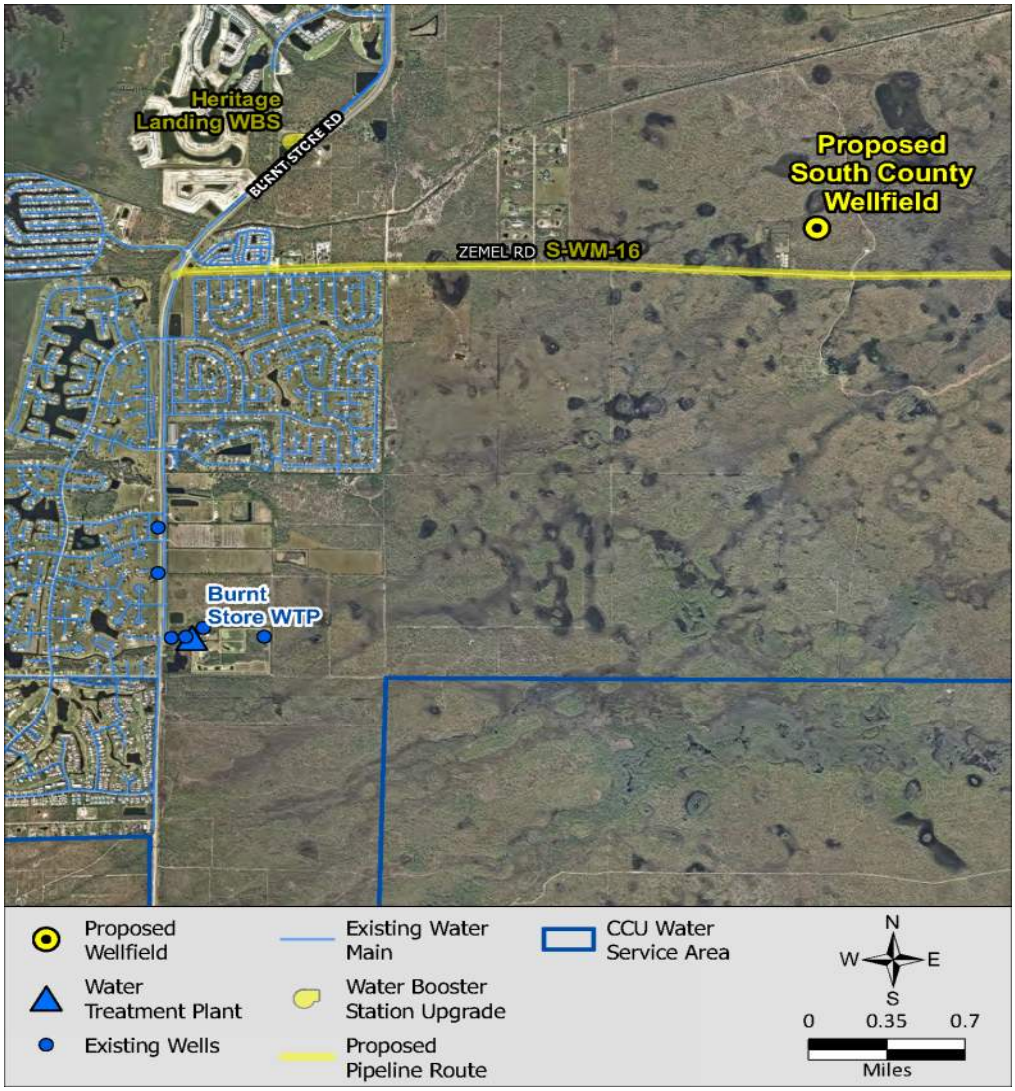
Project Type
Water Supply

Pipe Length
25000 feet

Pipe Diameter
24 inches

PROJECT COMPONENTS

- ☑ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023/24	2025/26	2027/28	2029/30	Total
Professional Services	300	500	500	300	1,600
Internal Costs					
Construction Cost	2,700	4,500	4,500	2,700	14,400
Other Fees and Costs					
Total Project Cost	**3,000**	**5,000**	**5,000**	**3,000**	**16,000**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-9 - Babcock Ranch Wellfield Design and Construction

Related CIP: S-WM-14 | **Project Area Served:** Mid/South County

Description: Design and construct a wellfield for the Babcock Ranch water supply. This improvement includes phased expansions to meet initial finished water demand of 8 MGD and future demands of 16 MGD and 24 MGD. Costs herein are based on wellfield raw water capacity of 10 MGD, expanded to 20 MGD and 30 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2045

PROJECT DETAILS

Project Location
East County

Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

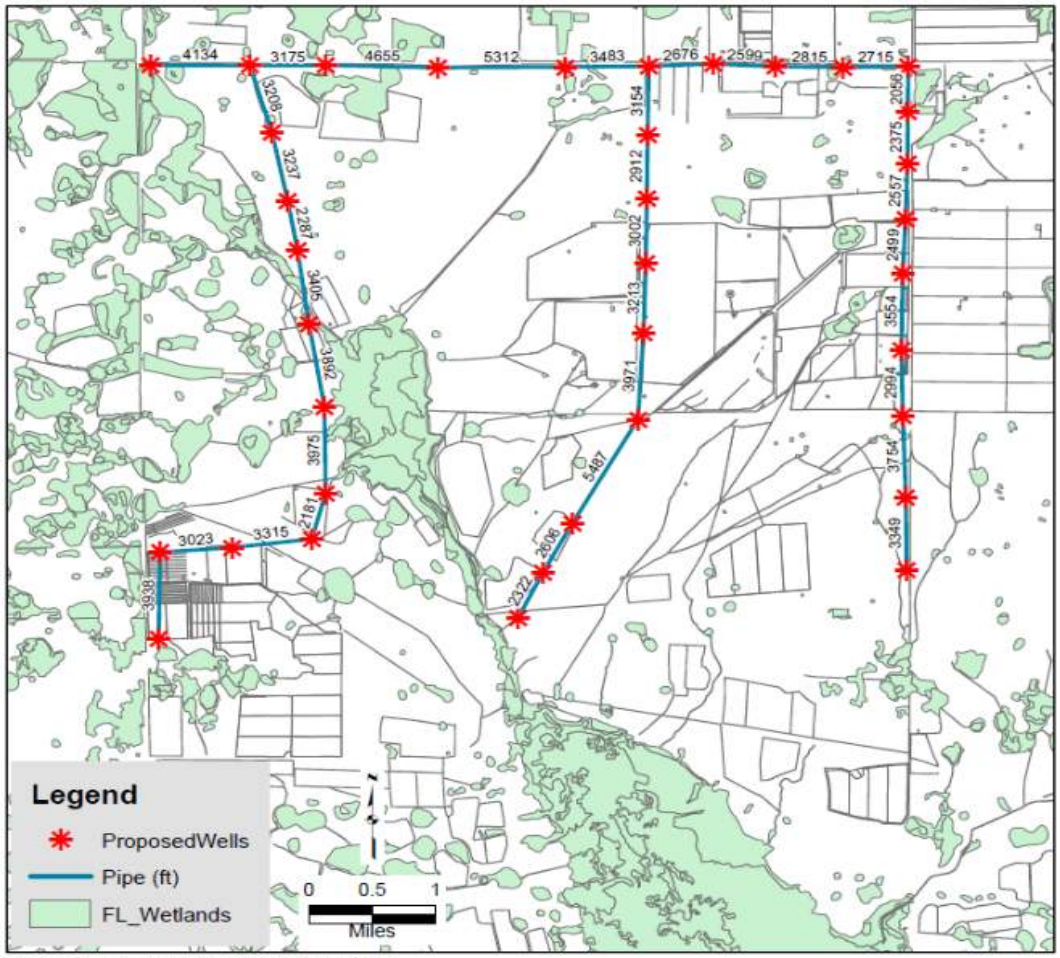


Figure 1. Conceptual Wellfield Map

Expenditure Plan ($1000)

	2026-2030	2031-2035	2036-2040	2041-2045	Total
Professional Services -	4,560	2,260	1,065	1,060	8,945
Internal Costs					
Construction Cost -	41,040	20,390	9,560	9,565	80,555
Other Fees and Costs					
Total Project Cost	**45,600**	**22,650**	**10,625**	**10,625**	**89,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-10 - Babcock Ranch RO WTP Design and Construction

Related CIP: M-WM-11 | **Project Area Served:** Mid/South County

Description: Design and construct an 8 MGD RO WTP to treat Babcock Ranch water supply. This improvement includes phased expansions to meet initial finished water demand of 8 MGD and future demands of 16 MGD and 24 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2040 (16 MGD)

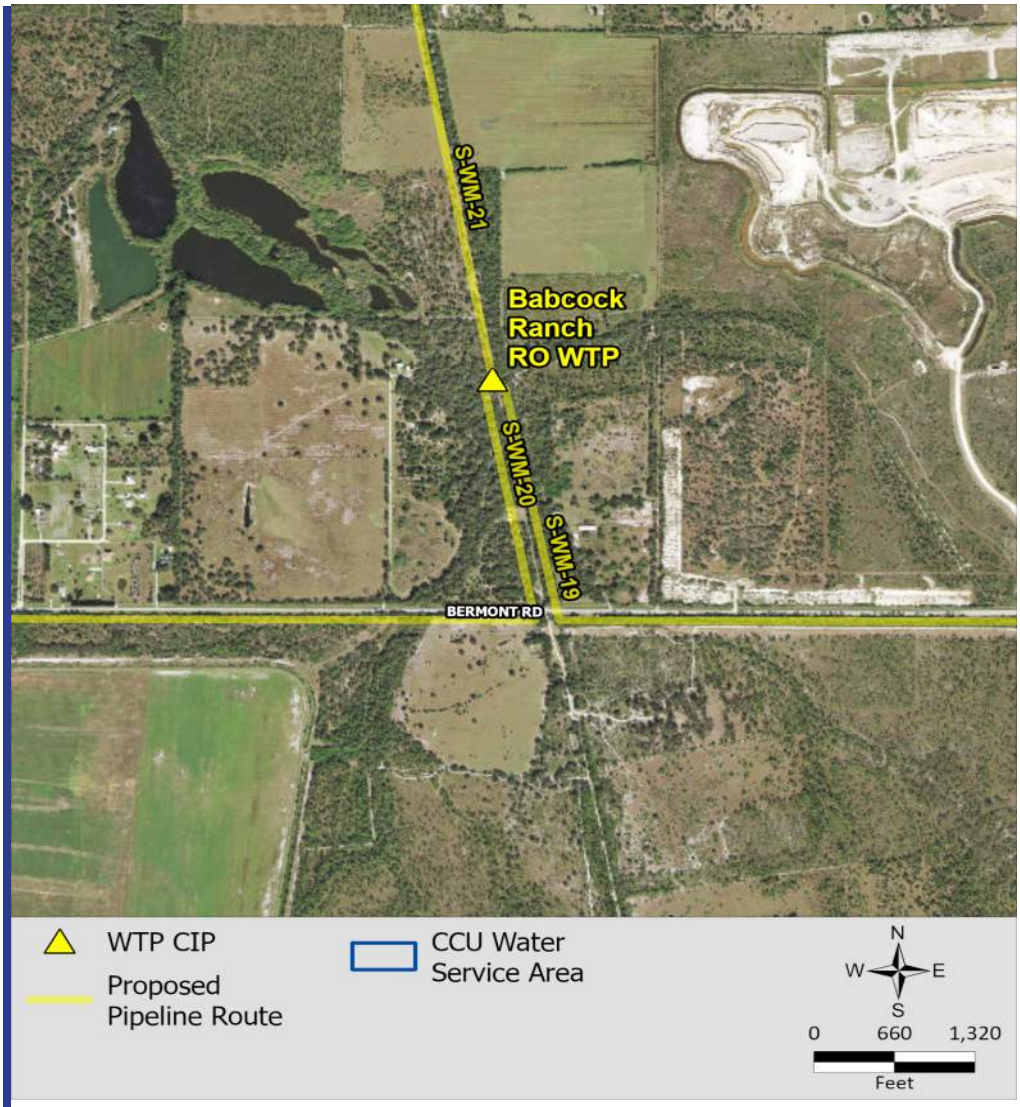
PROJECT DETAILS

Project Location
East County

Project Type
Water Treatment

Pipe Length
N/a

Pipe Diameter
N/a



PROJECT COMPONENTS

- ☑ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☑ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2026-2030	2031-2035	2036-2040	Beyond 2045	Total
Professional Services -	5,500	2,740	4,120	4,120	16,480
Internal Costs					
Construction Cost -	49,500	24,660	37,080	37,080	148,320
Other Fees and Costs					
Total Project Cost	**55,000**	**27,400**	**41,200**	**41,200**	**164,800**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **S-WM-19 - Babcock Ranch Raw Water Transmission Main and Booster Station**

Related CIP: **S-WTP-9** | **Project Area Served:** **Mid/South County**

Description: Install approximately 57,200 linear feet of 36-inch-diameter pipe to convey raw water from SR 31 to the Babcock Ranch WTP along Bermont Road. Includes a raw water booster station with phased expansions to 10, 20, and 30 MGD to meet finished water capacities of 8 , 16, and 24 MGD, respectively.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2045

PROJECT DETAILS

Project Location
East County

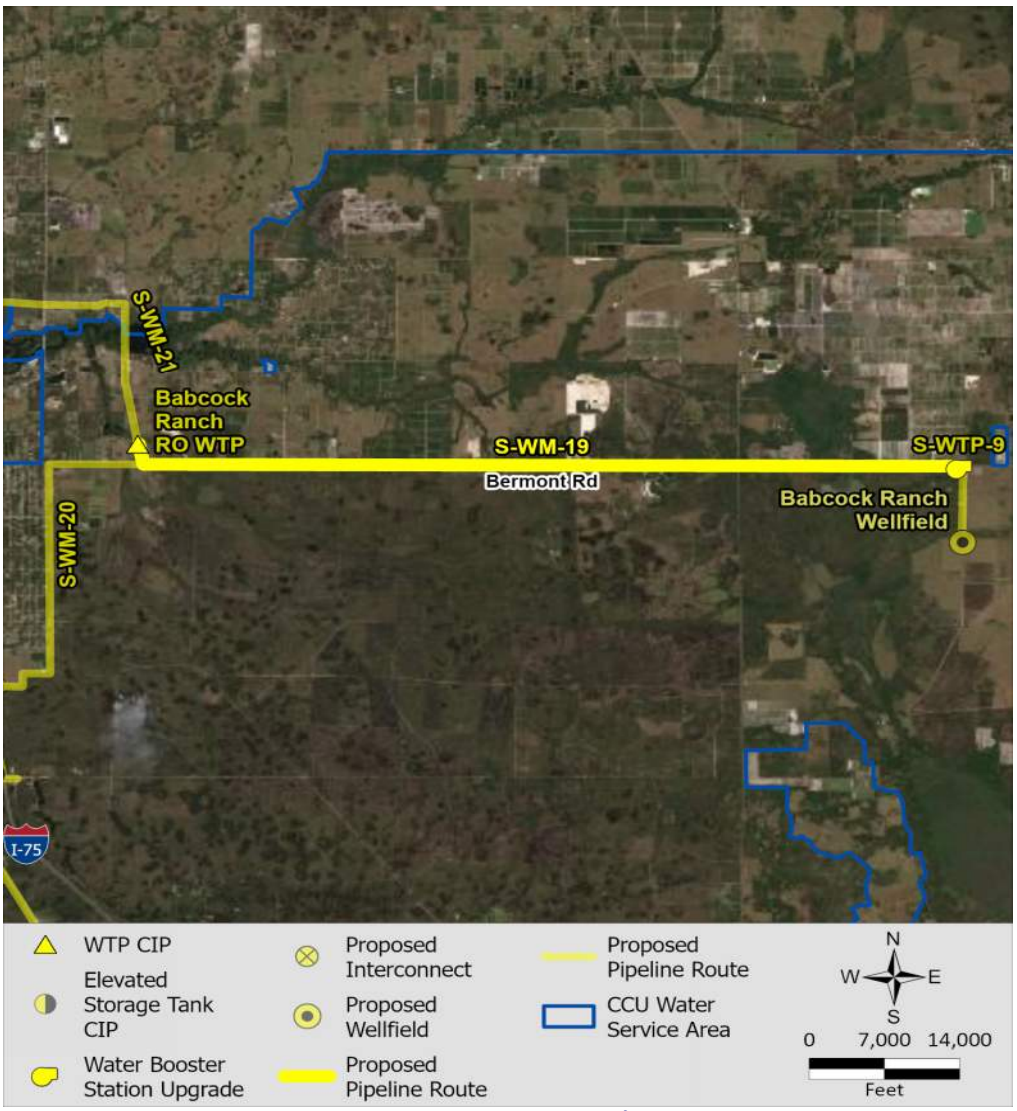
Project Type
Water Supply

Pipe Length
57200 feet

Pipe Diameter
36 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

		2026-2030	2031-2035	2036-2040	Beyond 2045	Total
Professional Services	-	3,870	1,930	1,125	1,125	8,050
Internal Costs						
Construction Cost	-	34,830	17,370	10,125	10,125	72,450
Other Fees and Costs						
Total Project Cost		**38,700**	**19,300**	**11,250**	**11,250**	**80,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-21 - Mid County Transmission Main

Related CIP: S-WTP-10 | **Project Area Served:** Mid County

Description: Install approximately 50,000 linear feet of 36-inch-diameter water main from Babcock Ranch WTP to Mid County to convey 8 MGD initially, up to 24 MGD. Includes approximately 9,000 linear feet of HDD piping for river crossings.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2035

PROJECT DETAILS

Project Location
East County

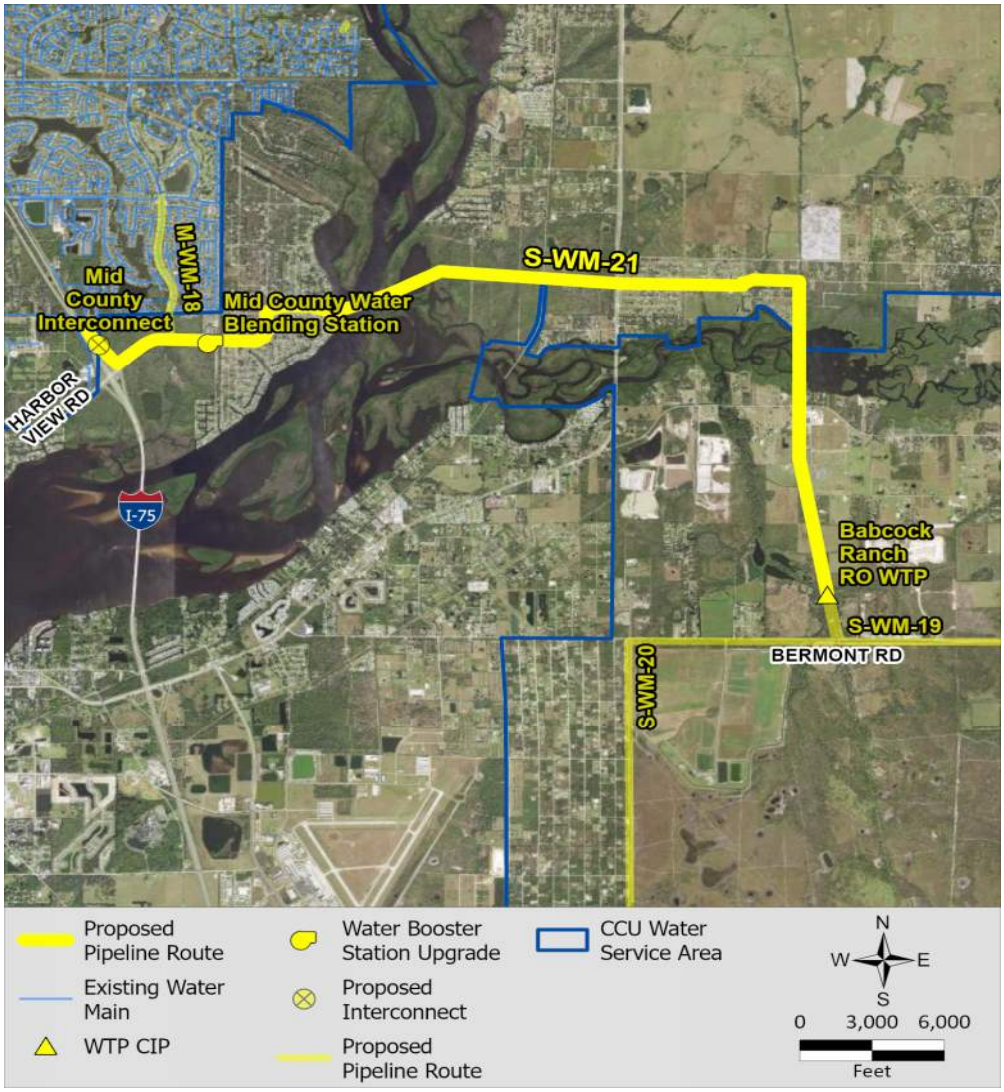
Project Type
Water Supply

Pipe Length
49600 feet

Pipe Diameter
36 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026/27	2028/29	2030/31	2032/33	Total
Professional Services	1,190	1,190	1,190	-	3,570
Internal Costs					
Construction Cost			21,420	10,710	32,130
Other Fees and Costs					
Total Project Cost	**1,190**	**1,190**	**22,610**	**10,710**	**35,700**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-20 - South County Transmission Main

Related CIP: S-WTP-10 | **Project Area Served:** South County

Description: Install approximately 28,500 linear feet of 16-inch-diameter water main from Babcock Ranch WTP to South County connection at Jones Loop Road. This connection will provide redundancy to the South County distribution system, allowing CCU to supplement Burnt Store WTP finished water with Babcock Ranch water supplies.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
South County

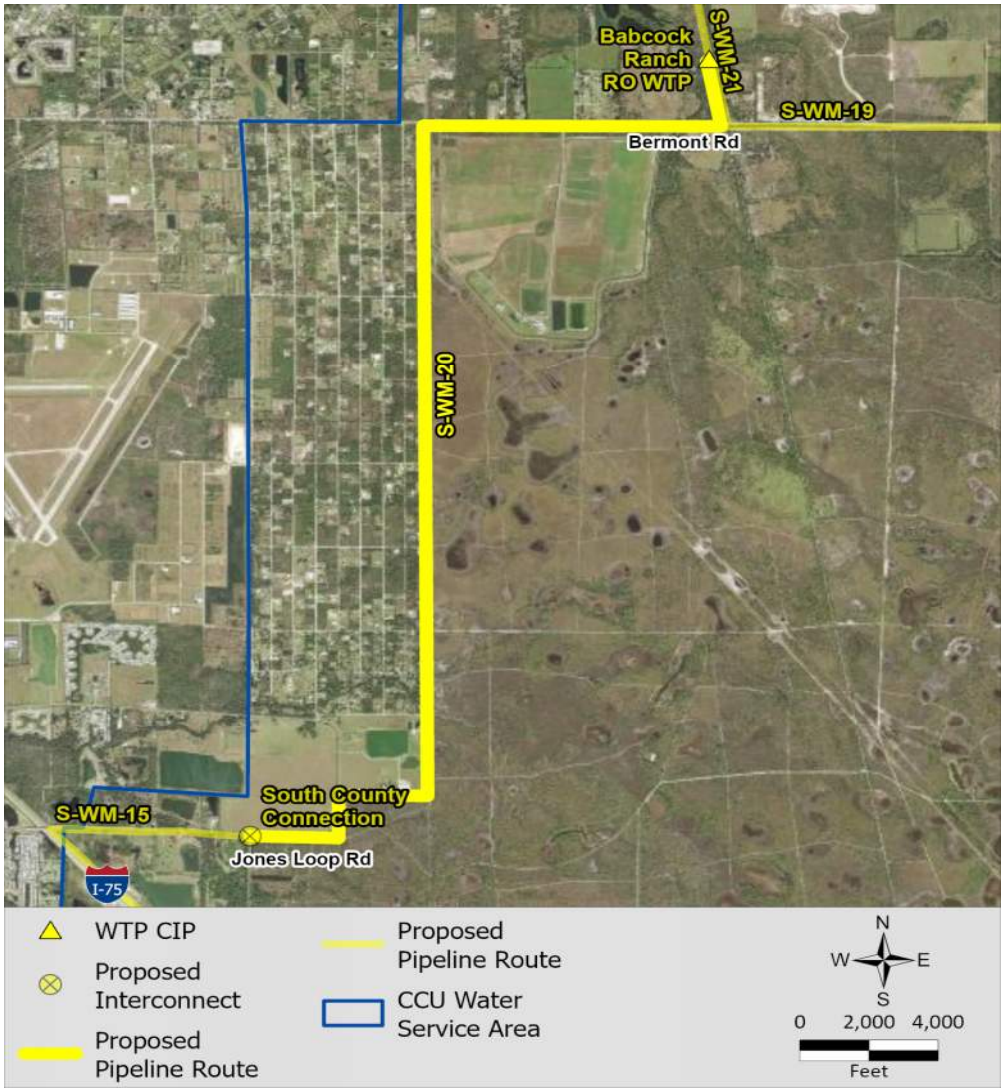
Project Type
Water Supply

Pipe Length
28500 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2036	2037	2038	2039	Total
Professional Services	1,240	372	248		1,860
Internal Costs					
Construction Cost		5,270	5,270		10,540
Other Fees and Costs					
Total Project Cost	**1,240**	**5,642**	**5,518**		**12,400**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-WBS-11 - Mid County Water Source Blending Station Design and Construction**

Related CIP: **S-WTP-10** | **Project Area Served:** **Mid County**

Description: Install a water blending/boosting station in Mid County to receive and blend finished RO water from Babcock Ranch with treated surface water from Peace River. This improvement includes phased expansions to meet initial finished water demand of 8 MGD and future demands of 16 MGD and 24 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2045

PROJECT DETAILS

Project Location
Mid County

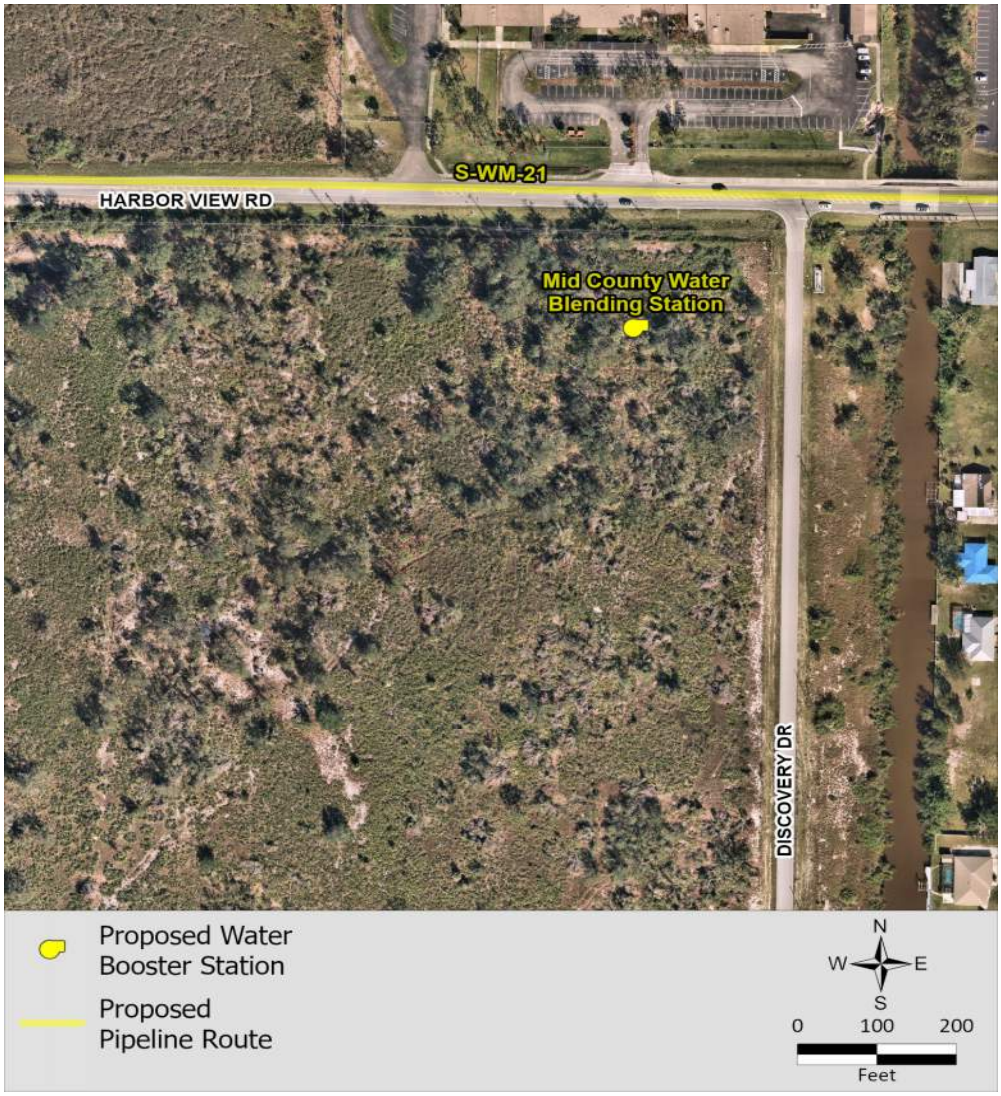
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

		2026-2030	2031-2035	2036-2040	Beyond 2045	Total
Professional Services	-	1,200	600	900	900	3,600
Internal Costs						
Construction Cost	-	10,800	5,400	8,100	8,100	32,400
Other Fees and Costs						
Total Project Cost		**12,000**	**6,000**	**9,000**	**9,000**	**36,000**

(Costs expressed in 2023 dollars)

Facilities Projects

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-1 - Gulf Cove Pipe Replacement

Related CIP: None | **Project Area Served:** Mid/West County

Description: Replace concrete encased pipe at the Gulf Cove WBS connecting the GST and pumping building.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Gulf Cove WBS

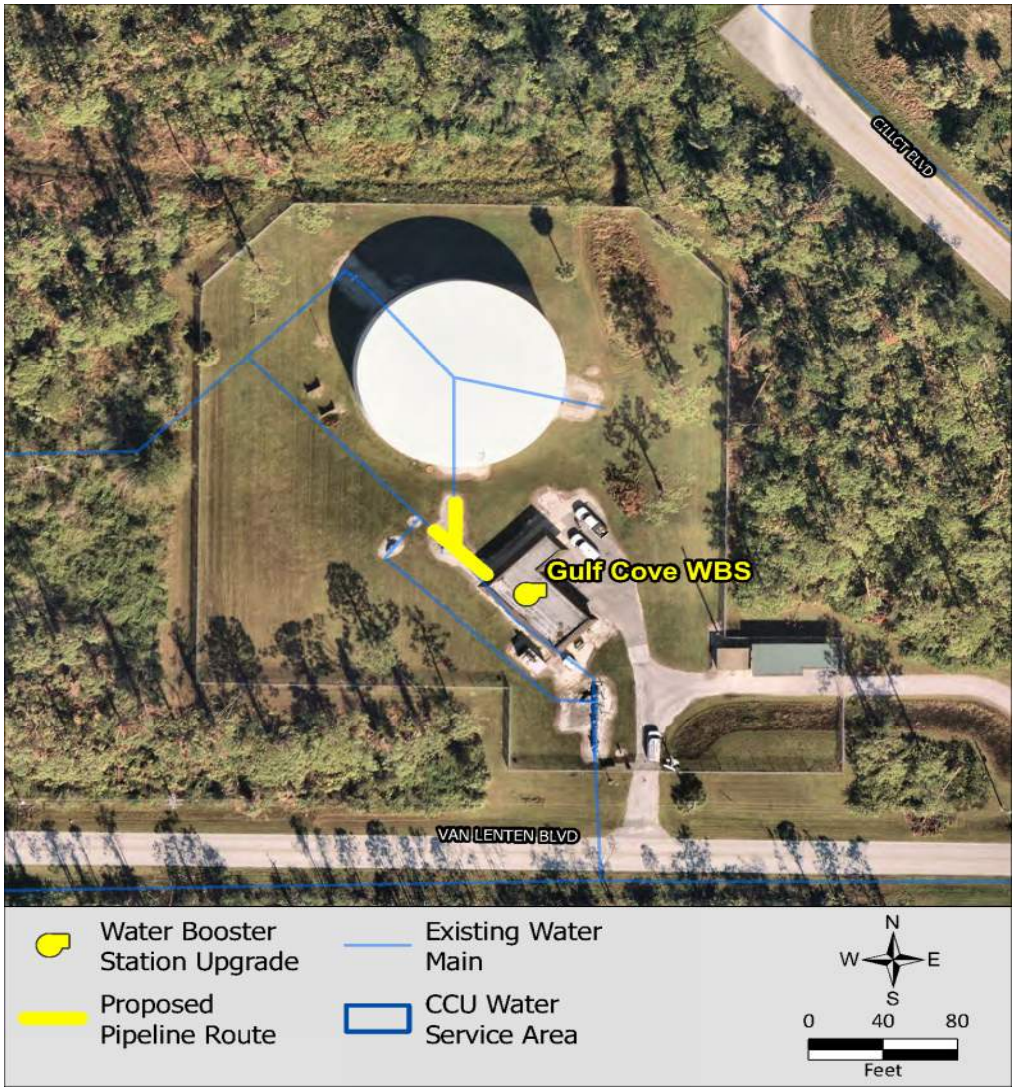
Project Type
Water Supply

Pipe Length
50 feet

Pipe Diameter
36 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	22	7	4	33
Internal Costs				
Construction Cost		93	92	185
Other Fees and Costs				
Total Project Cost	**22**	**100**	**96**	**218**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-2 - Gulf Cove Pumping Upgrade Phase-1

Related CIP: None | **Project Area Served:** Mid/West County

Description: Upgrade Gulf Cove WBS electrical, generator, and diesel storage.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- [ ] Safety
- [ ] Mandate
- [x] Replace
- [ ] Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Gulf Cove WBS

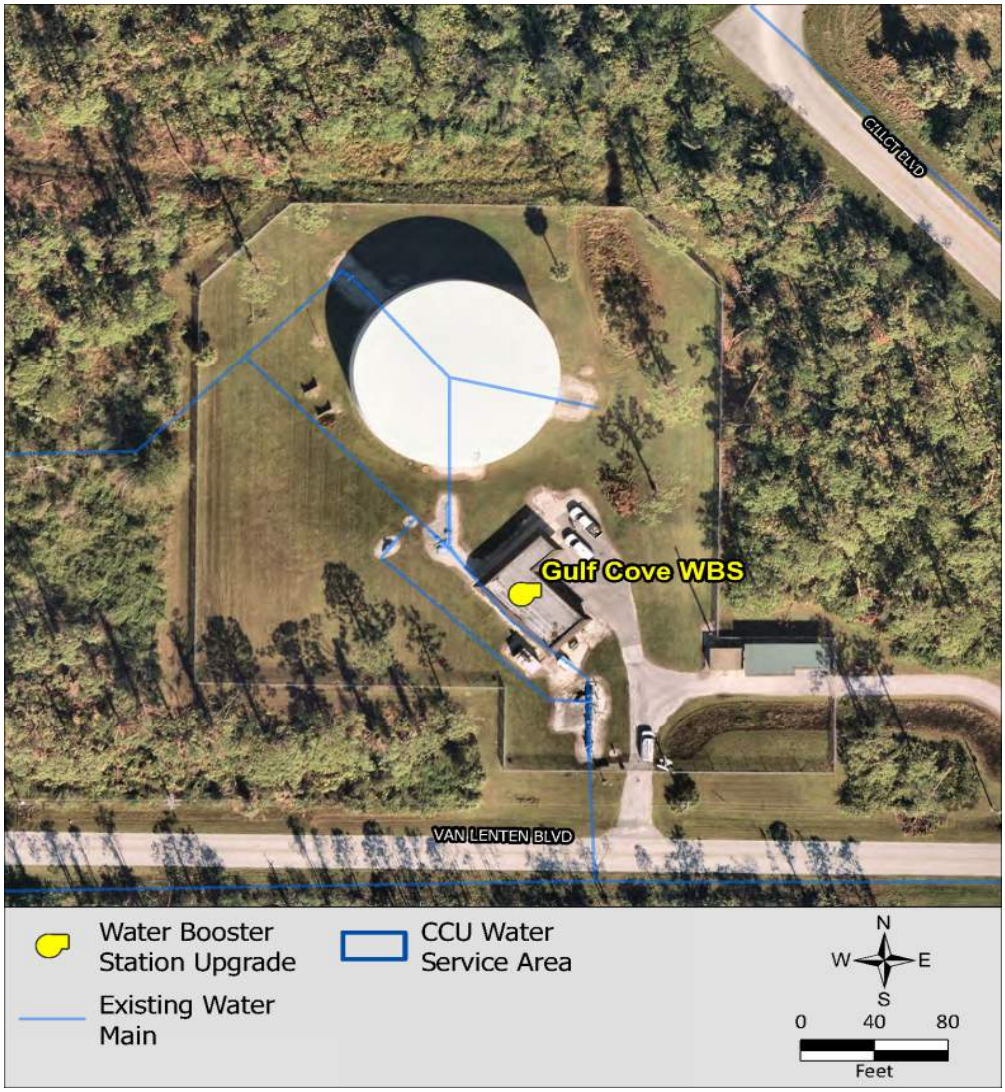
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- [ ] Water Treatment Plant
- [x] Water Booster Station
- [ ] Water Main
- [ ] Hydrants or Valves
- [ ] Water Storage
- [ ] Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	45	14	9	68
Internal Costs				
Construction Cost		191	191	382
Other Fees and Costs				
Total Project Cost	**45**	**205**	**200**	**450**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WBS-3 - Walenda Pumping Upgrade Phase-1

Related CIP: None | **Project Area Served:** Mid County

Description: Upsize Walenda WBS pumping capacity (replace smaller pumps with one 100 HP and two 150-HP pumps), electrical, generator, and discharge piping.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Walenda WBS

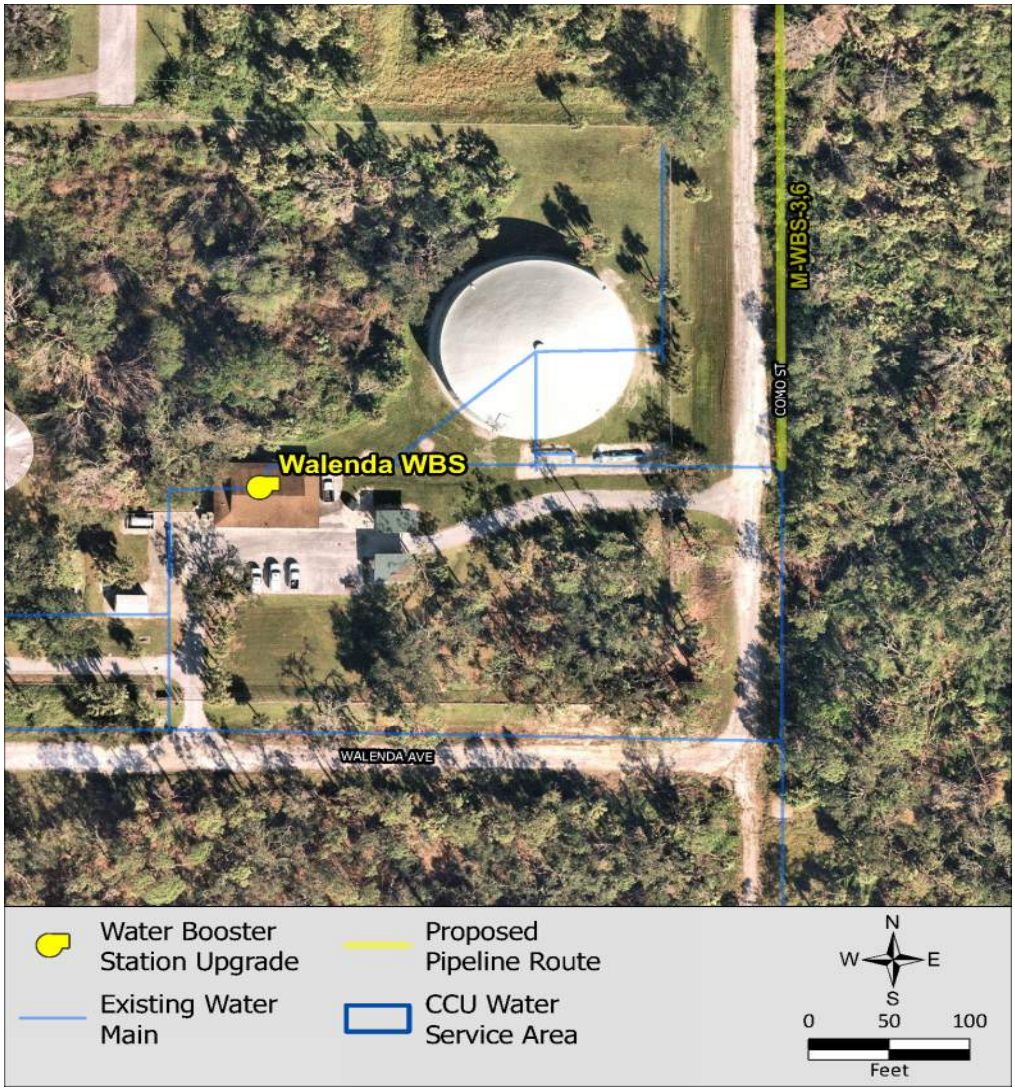
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	75	22	15	112
Internal Costs				
Construction Cost		319	319	638
Other Fees and Costs				
Total Project Cost	**75**	**341**	**334**	**750**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-4 - Rotonda Pumping Upgrade Phase-1

Related CIP: None | **Project Area Served:** West County

Description: Upsize Rotonda WBS pumping capacity (replace smaller pumps with two 150 HP pumps), electrical, switchgear, and generator.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Rotonda WBS

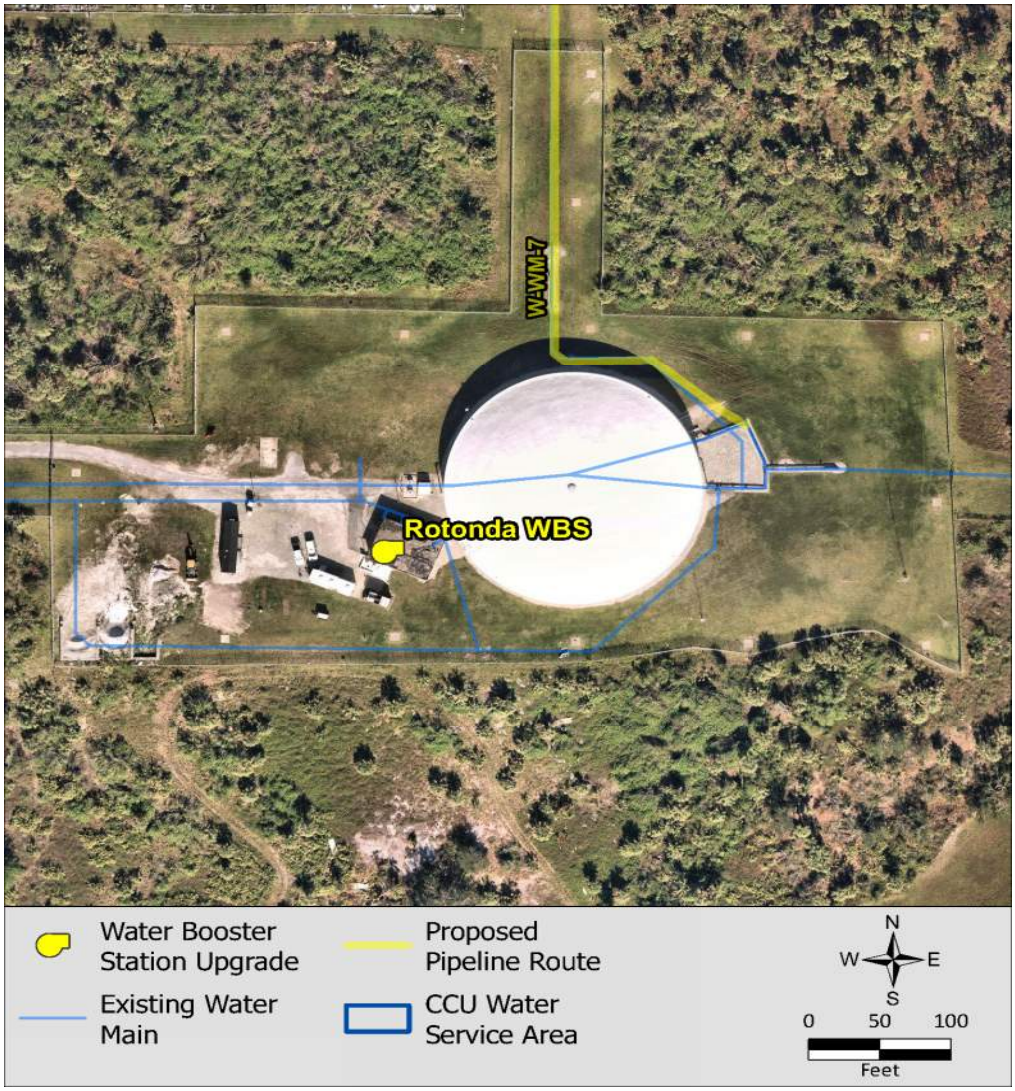
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	60	18	12	90
Internal Costs				
Construction Cost		255	255	510
Other Fees and Costs				
Total Project Cost	**60**	**273**	**267**	**600**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WBS-5 - Heritage Landing WBS

Related CIP: CMP-5 | **Project Area Served:** Burnt Store/South County

Description: Install a new WBS with GST at Heritage Landing to convey approximately 7 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
South County/ Burnt Store

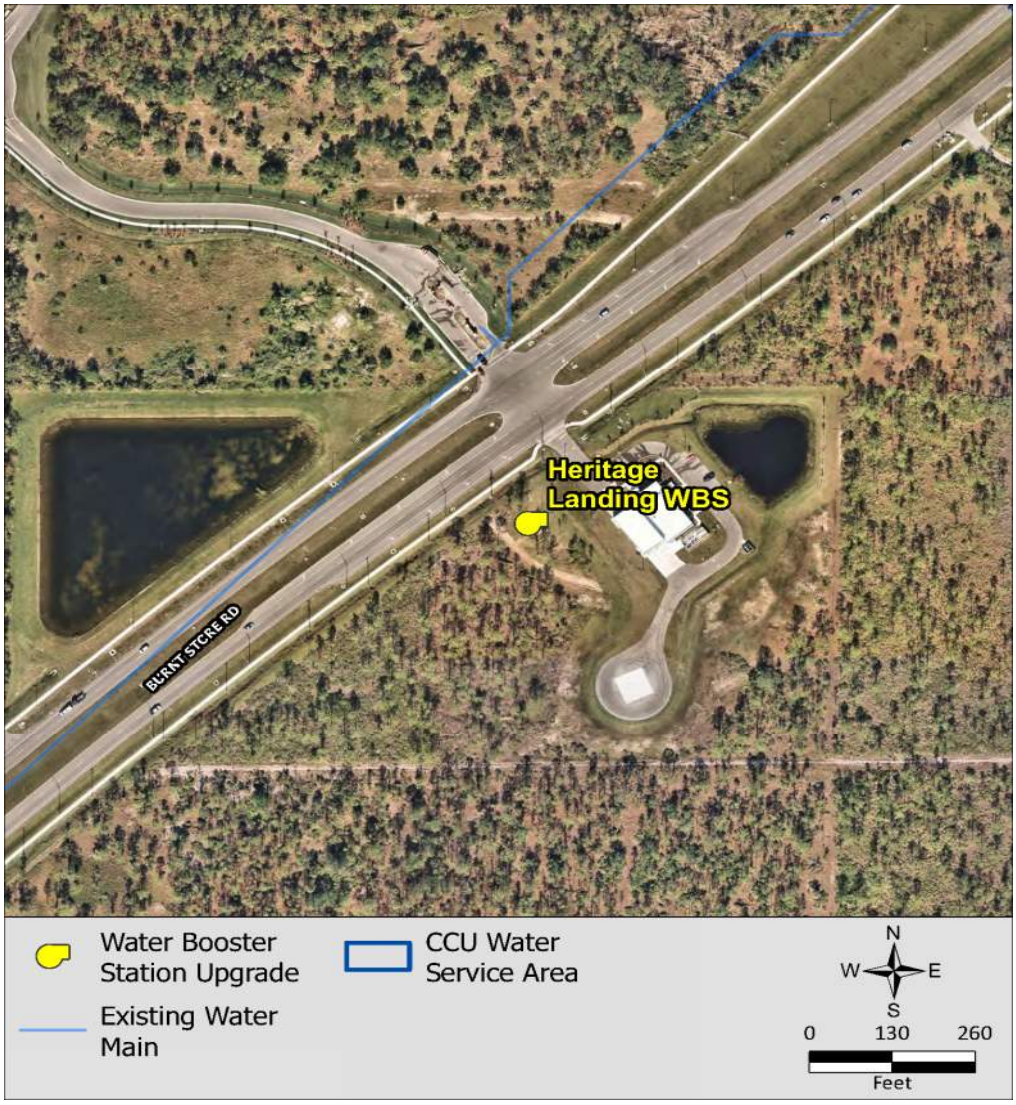
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☑ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	450	135	90	675
Internal Costs				
Construction Cost		1,915	1,910	3,825
Other Fees and Costs				
Total Project Cost	**450**	**2,050**	**2,000**	**4,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WBS-8 - O'Hara WBS

Related CIP: None | **Project Area Served:** Ackerman

Description: Install new in-line WBS at Ackerman/Ohara Dr (shared site of the existing O'Hara Lift Station).

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Mid County

Project Type
Water Quality

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	234	70	47	351
Internal Costs				
Construction Cost		996	996	1,992
Other Fees and Costs				
Total Project Cost	**234**	**1,066**	**1,043**	**2,343**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-EST-1 - Tuckers Grade EST

Related CIP: S-WM-5 | **Project Area Served:** Tuckers Grade

Description: Install a new EST (0.5 to 1.5 MGD) on Tucker's Grade Road near I-75 to increase system pressures and support fire flow events.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
South County

Project Type
Water Storage

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☑ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	400	120	80	600
Internal Costs				
Construction Cost		1,700	1,700	3,400
Other Fees and Costs				
Total Project Cost	**400**	**1,820**	**1,780**	**4,000**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-3 - BS WTP RO Process Improvements

Related CIP: None | **Project Area Served:** Burnt Store/South County

Description: Replace train end caps and RO membranes at the Burnt Store WTP.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- [x] Safety
- [ ] Mandate
- [x] Replace
- [ ] Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Burnt Store RO WTP

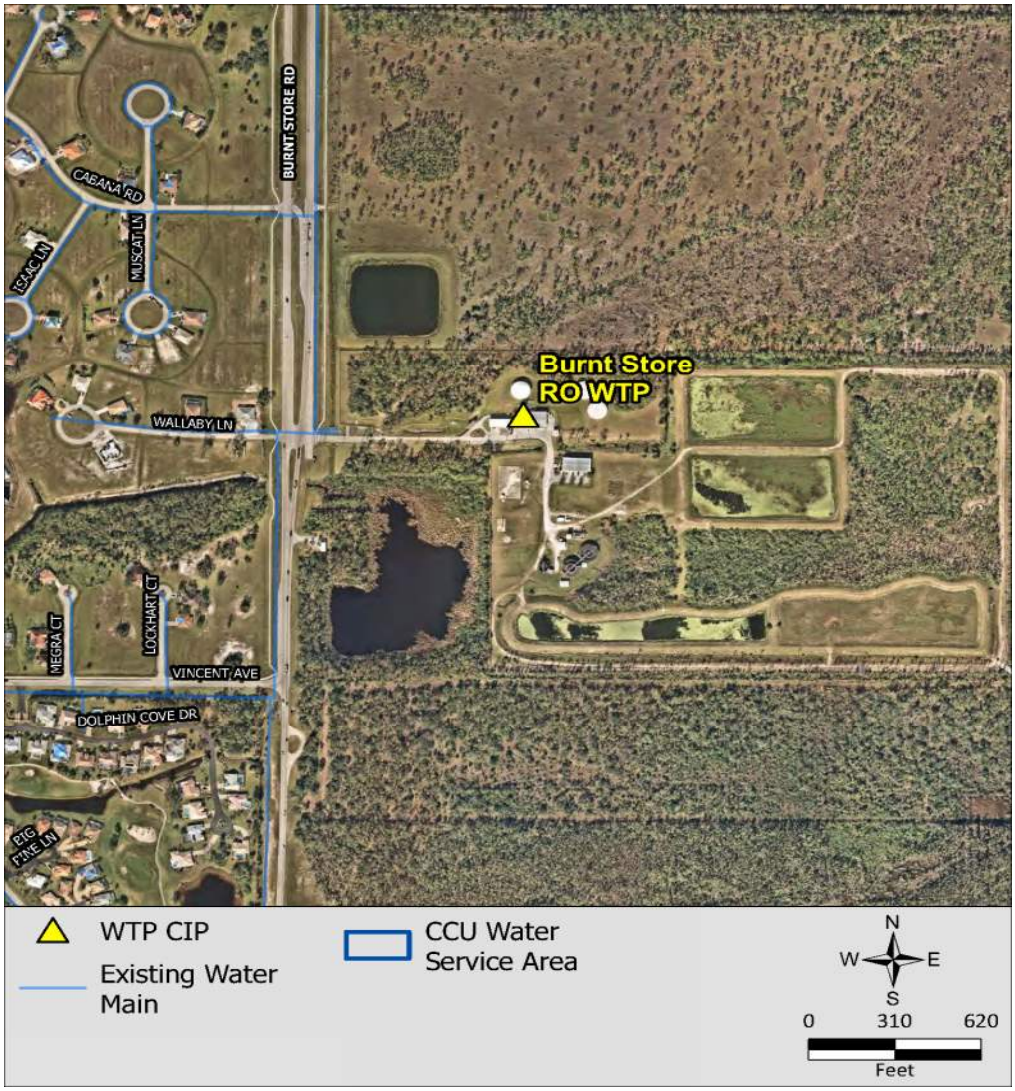
Project Type
Water Treatment

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- [x] Water Treatment Plant
- [ ] Water Booster Station
- [ ] Water Main
- [ ] Hydrants or Valves
- [ ] Water Storage
- [ ] Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	54	16	11	81
Internal Costs				
Construction Cost		230	229	459
Other Fees and Costs				
Total Project Cost	**54**	**246**	**240**	**540**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-9 - Gulf Cove Upgrade Phase-2

Related CIP: M-WM-18 | **Project Area Served:** Gulf Cove/West County

Description: Upgrade Gulf Cove WBS to convey approximately 10 MGD and replace existing GST with a new GST of similar size.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2030

PROJECT DETAILS

Project Location
Gulf Cove WBS

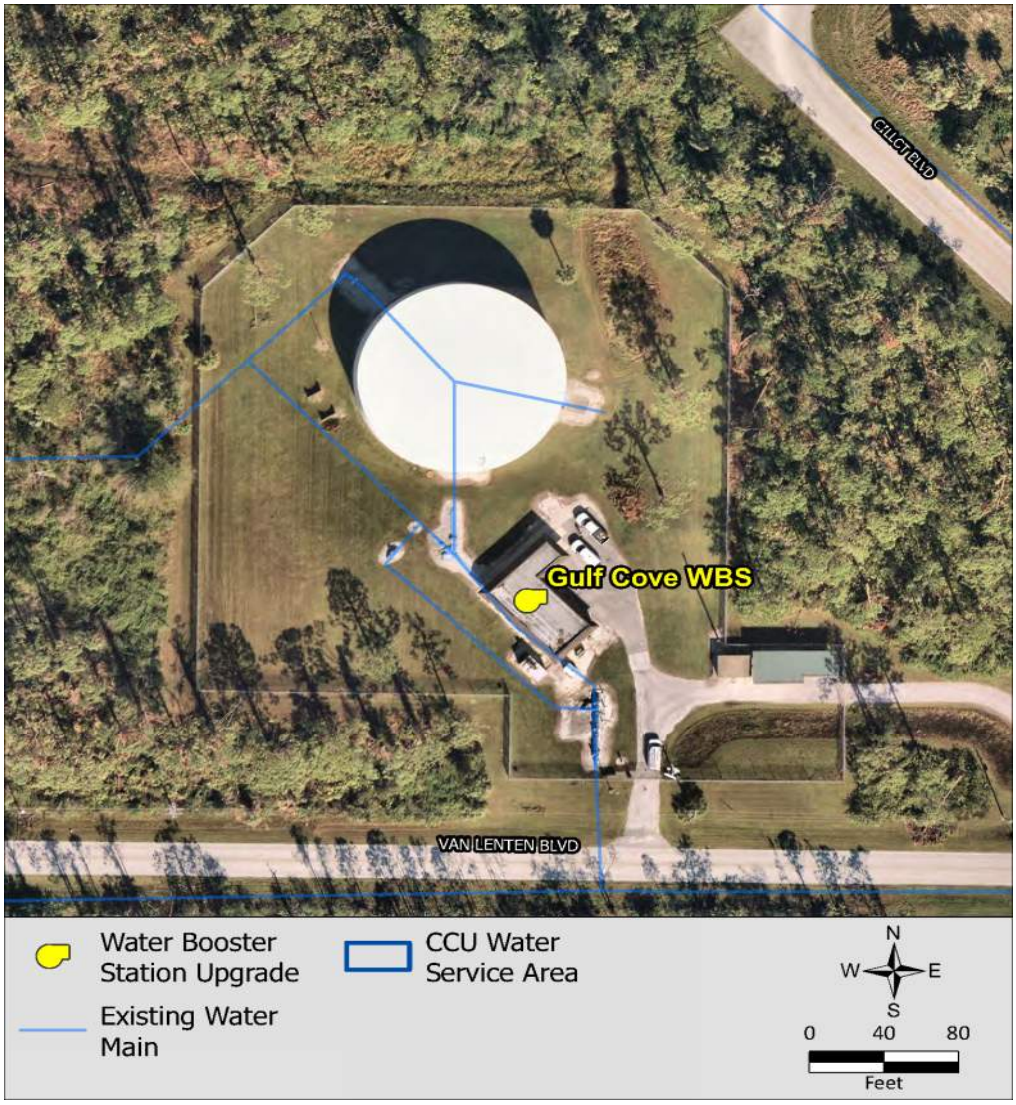
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023/24	2025/26	2027/28	2029/30	Total
Professional Services	700	210	140		1,050
Internal Costs					
Construction Cost		3,090	2,860		5,950
Other Fees and Costs					
Total Project Cost	**700**	**3,300**	**3,000**		**7,000**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WBS-6 - Walenda Upgrade Phase-2

Related CIP: M-WBS-3 | **Project Area Served:** Murdock/Mid County

Description: Upgrade the Walenda WBS pumping capacity, electrical, generator, diesel storage, and discharge piping to convey approximately 11 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Walenda WBS

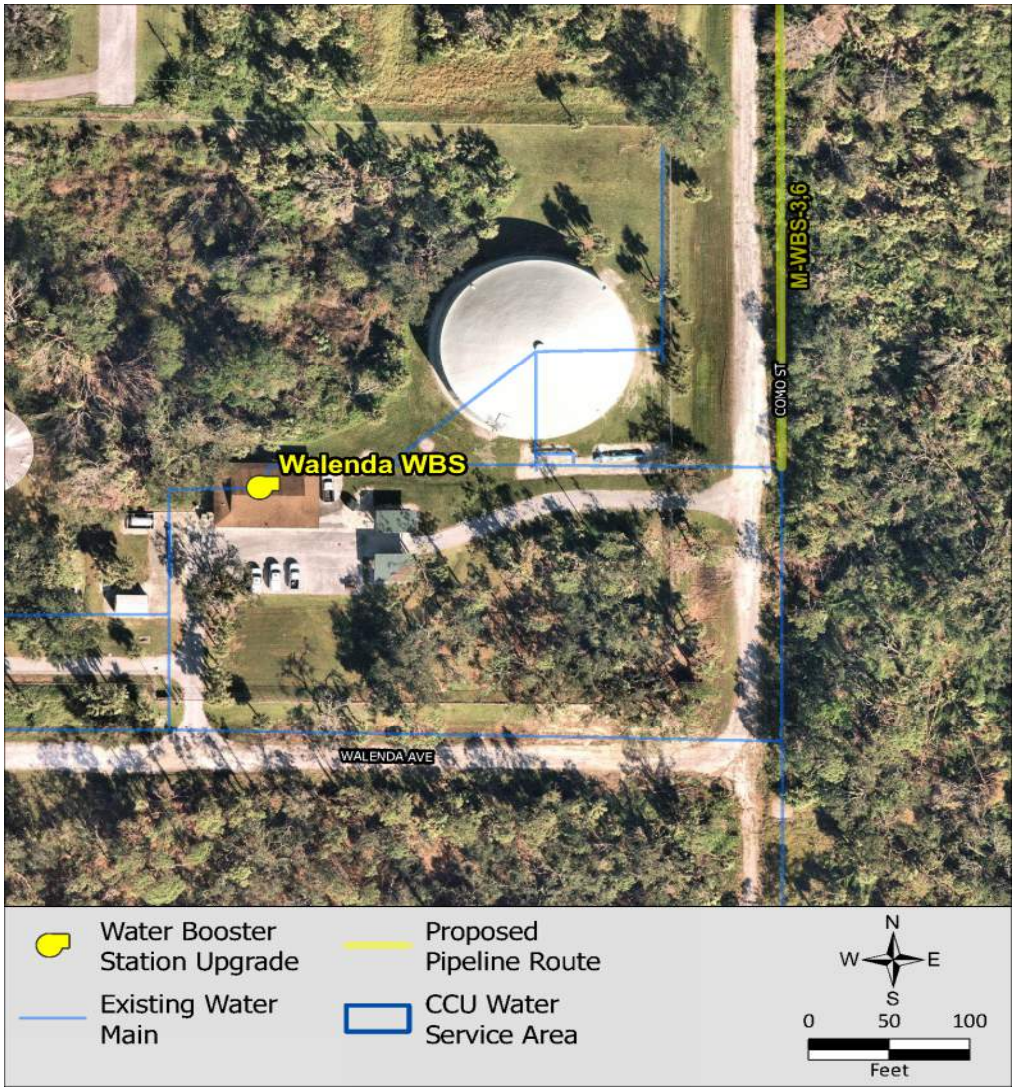
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	600	180	120		900
Internal Costs					
Construction Cost		2,550	2,550		5,100
Other Fees and Costs					
Total Project Cost	**600**	**2,730**	**2,670**		**6,000**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-7 - Rotonda Upgrade Phase-2

Related CIP: W-WBS-4 | **Project Area Served:** West County

Description: Upgrade Rotonda WBS pumping capacity and discharge piping to convey approximately 7 MGD; replace existing GST with two new 2.5-3 MG GSTs.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Rotonda WBS

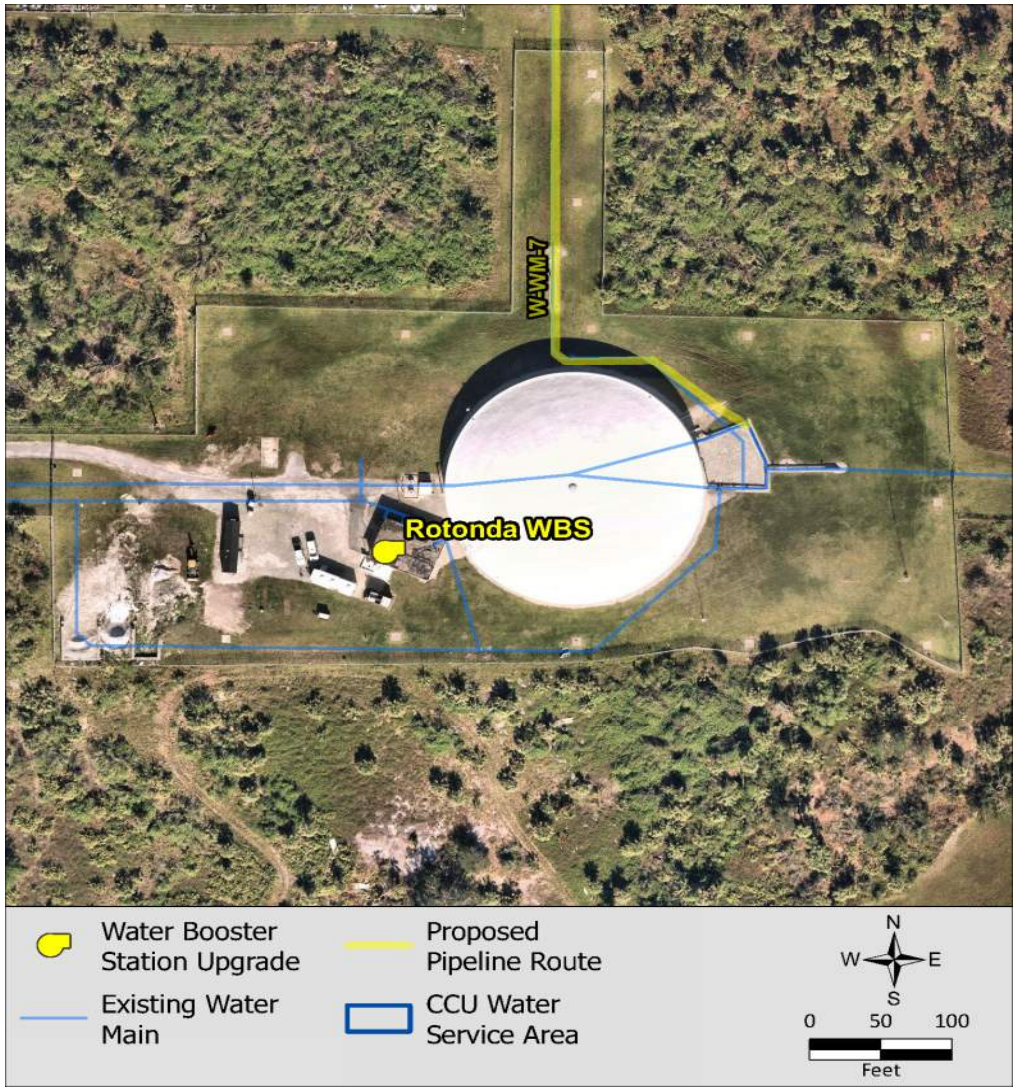
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	750	225	150		1,125
Internal Costs					
Construction Cost		3,188	3,187		6,375
Other Fees and Costs					
Total Project Cost	**750**	**3,413**	**3,337**		**7,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WBS-10 - Robin Road WBS

Related CIP: W-WBS-9 | **Project Area Served:** South Gulf Cove

Description: Install a new in-line WBS near Robin Road and Bluebird Drive.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Meadows & Villas

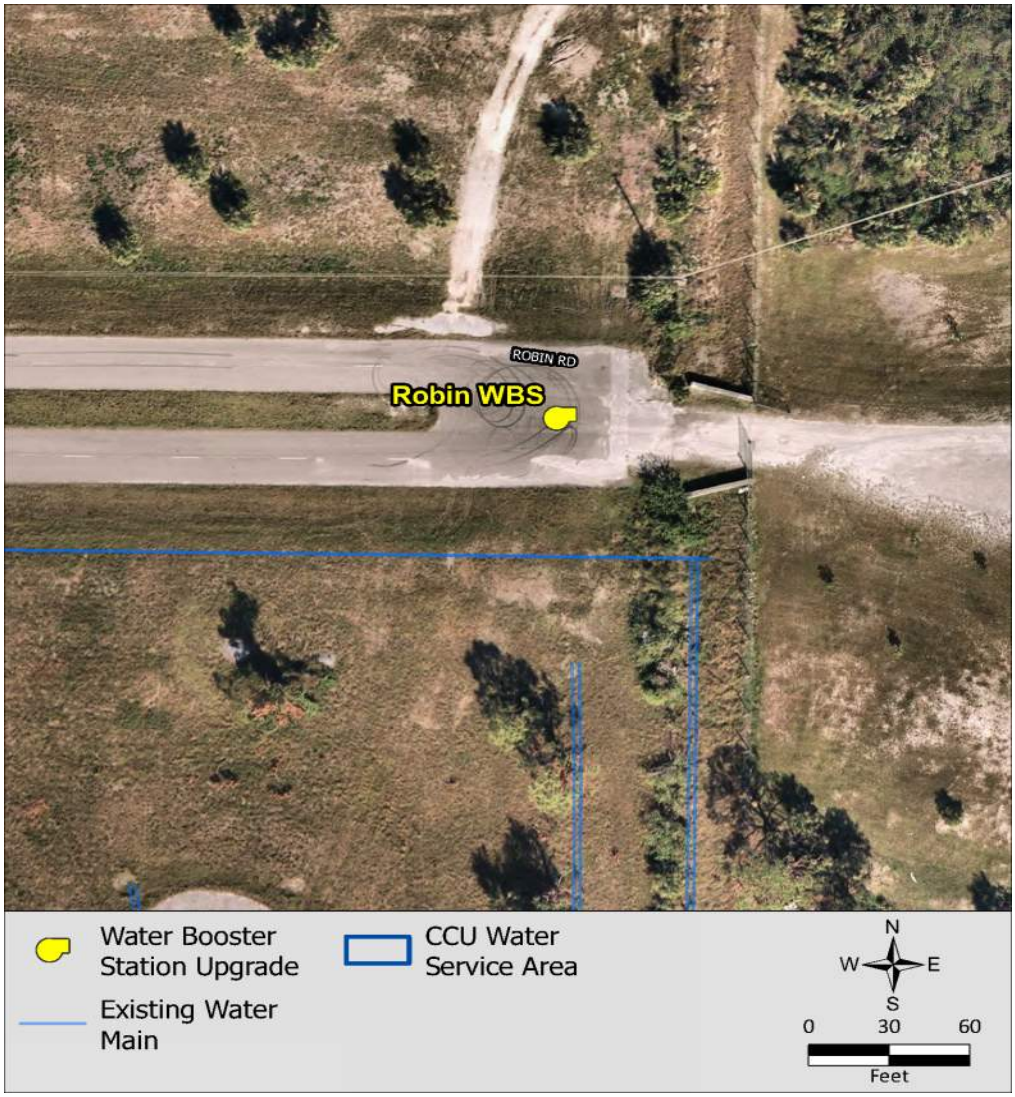
Project Type
Water Quality

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☑ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	234	70	47		351
Internal Costs					
Construction Cost		996	996		1,992
Other Fees and Costs					
Total Project Cost	**234**	**1,066**	**1,043**		**2,343**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WTP-2 - Burnt Store WTP Pumping Upgrade

Related CIP: None | **Project Area Served:** South County

Description: Upsize the Burnt Store RO WTP high service pumps to convey approximately 10 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☑ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
South County

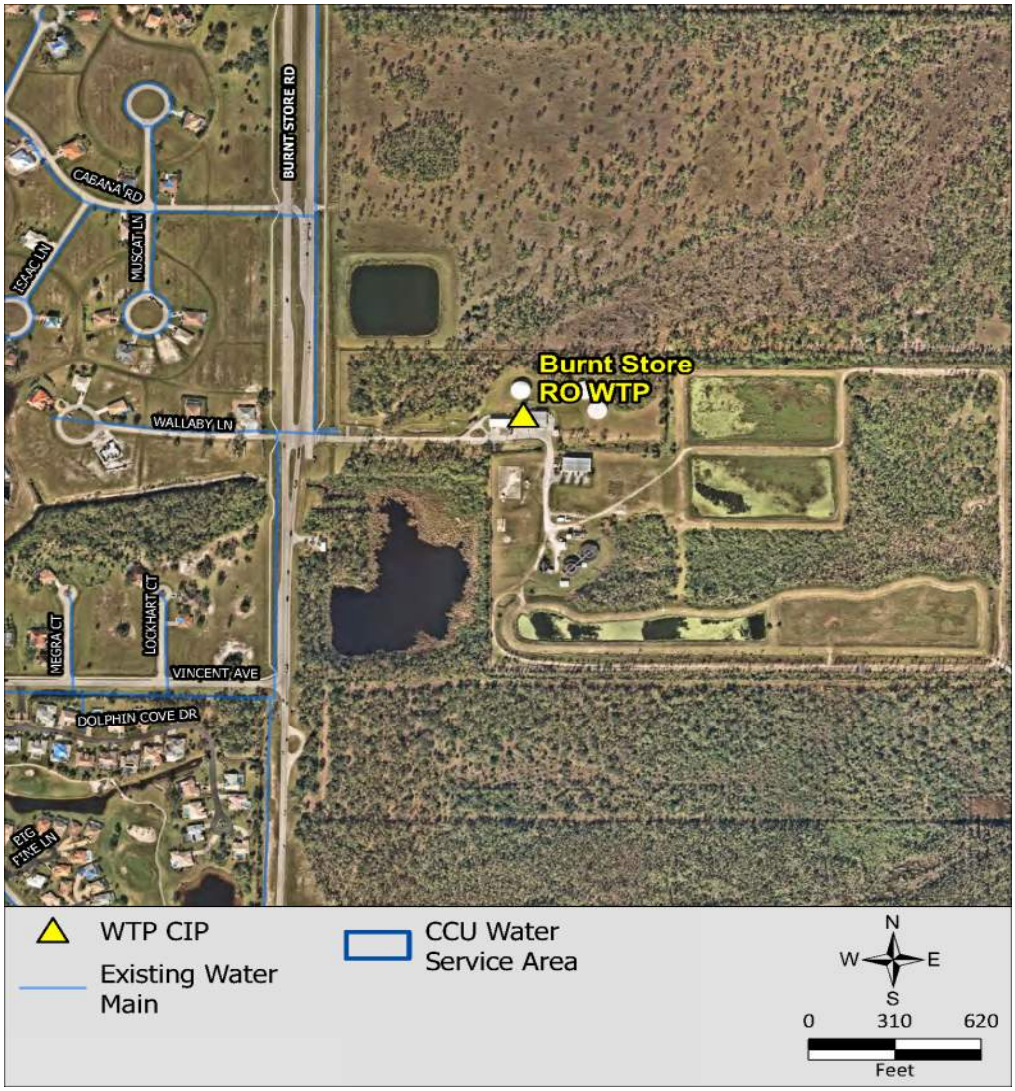
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☑ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2031	2032	2033	2034	2035	Total
Professional Services	450	135	90			675
Internal Costs						
Construction Cost		1,915	1,910			3,825
Other Fees and Costs						
Total Project Cost	**450**	**2,050**	**2,000**			**4,500**

(Costs expressed in 2023 dollars)

Pipeline Projects

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-1 - CCU-PRMRWSA Phase IIB Expansion

Related CIP: None | **Project Area Served:** Mid/West County

Description: Install approximately 67,000 linear feet of 42-inch transmission main from the Harbor Interconnect to the Gulf Cove WBS. The main will be constructed along Hillsborough Boulevard, Chancellor Blvd, and Campbell Street, and include a subaqueous Myakka River crossing. CCU is currently coordinating with PRMRWSA to determine the number and location of new interconnects along the pipeline.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Mid County

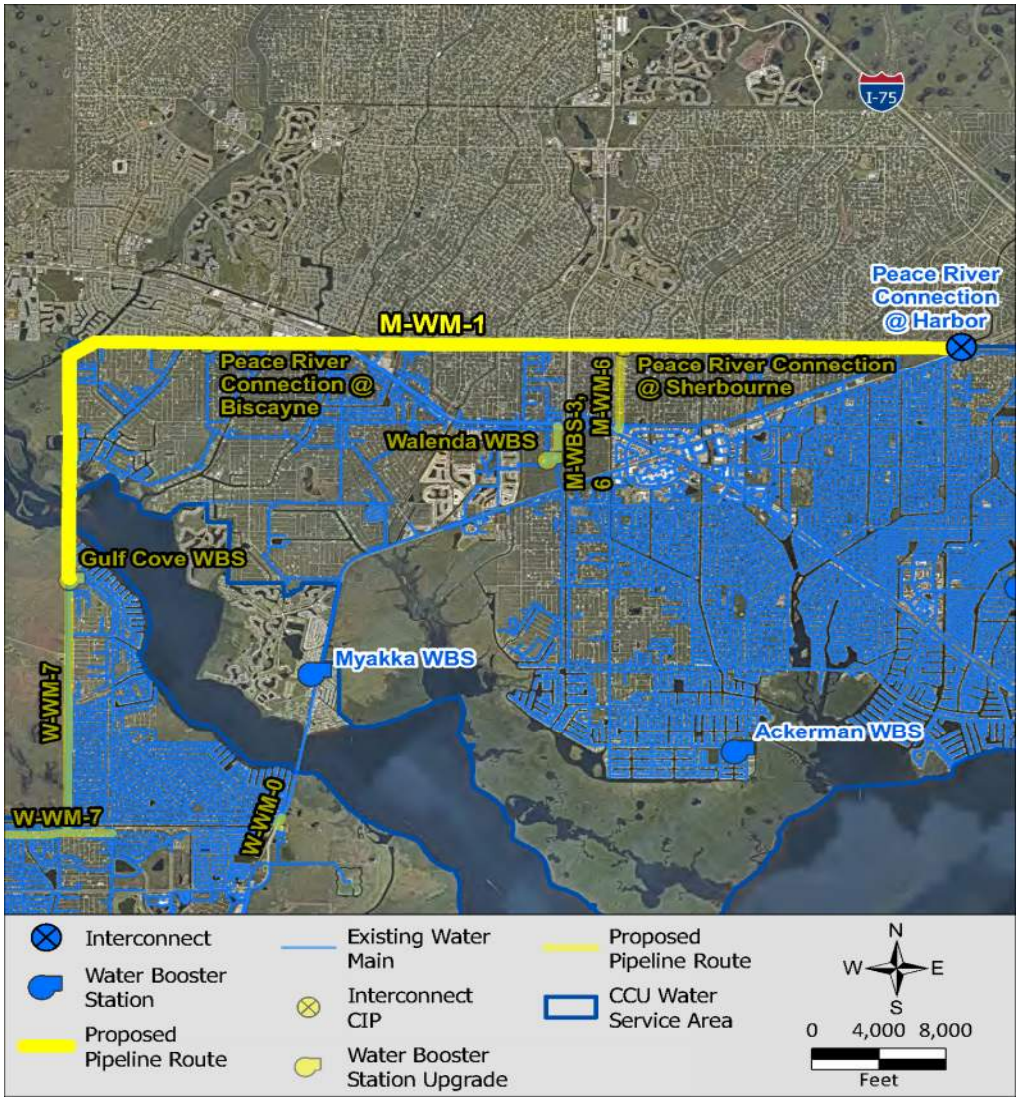
Project Type
Water Supply

Pipe Length
67000 feet

Pipe Diameter
42 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	3,750	1,125	750	5,625
Internal Costs				
Construction Cost		15,937	15,938	31,875
Other Fees and Costs				
Total Project Cost	**3,750**	**17,062**	**16,688**	**37,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-5 - Shotgun Road

Related CIP: M-WBS-3 | **Project Area Served:** Northeast South County

Description: Install approximately 5,200 linear feet of 16-inch-diameter water main along Shotgun Road from Burnt Store Road.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
South County

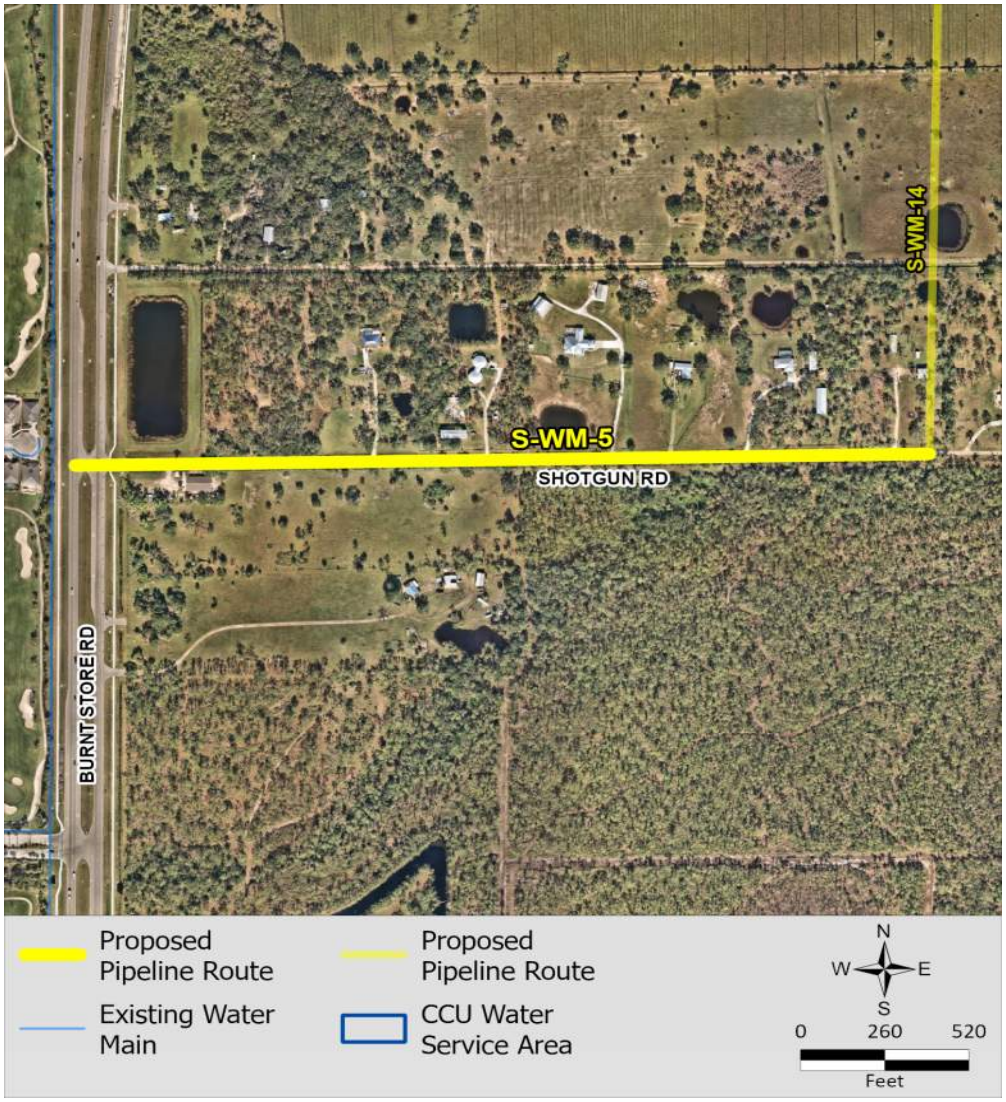
Project Type
Water Supply

Pipe Length
5200 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	166	50	34	250
Internal Costs				
Construction Cost		707	707	1,414
Other Fees and Costs				
Total Project Cost	**166**	**757**	**741**	**1,664**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-6 - Sherbourne Street

Related CIP: CMP-3 | **Project Area Served:** Walenda WBS

Description: Install approximately 7,830 linear feet of 24-inch-diameter water main along Sherbourne Street from Hillsborough Boulevard to US-41 (Tamiami Trail). This improvement will increase flow to the Walenda WBS.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2025

PROJECT DETAILS

Project Location
Mid County

Project Type
Water Supply

Pipe Length
7830 feet

Pipe Diameter
24 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2023	2024	2025	Total
Professional Services	305	92	61	458
Internal Costs				
Construction Cost		1,298	1,298	2,596
Other Fees and Costs				
Total Project Cost	**305**	**1,390**	**1,359**	**3,054**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-4 - Green Gulf Blvd

Related CIP: Identifier | **Project Area Served:** Northeast South County

Description: Install approximately 13,120 linear feet of 12-inch-diameter pipe parallel to Burnt Store Road, from Los Lomas Drive to Notre Dame Boulevard.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2023
End: 2030

PROJECT DETAILS

Project Location
South County

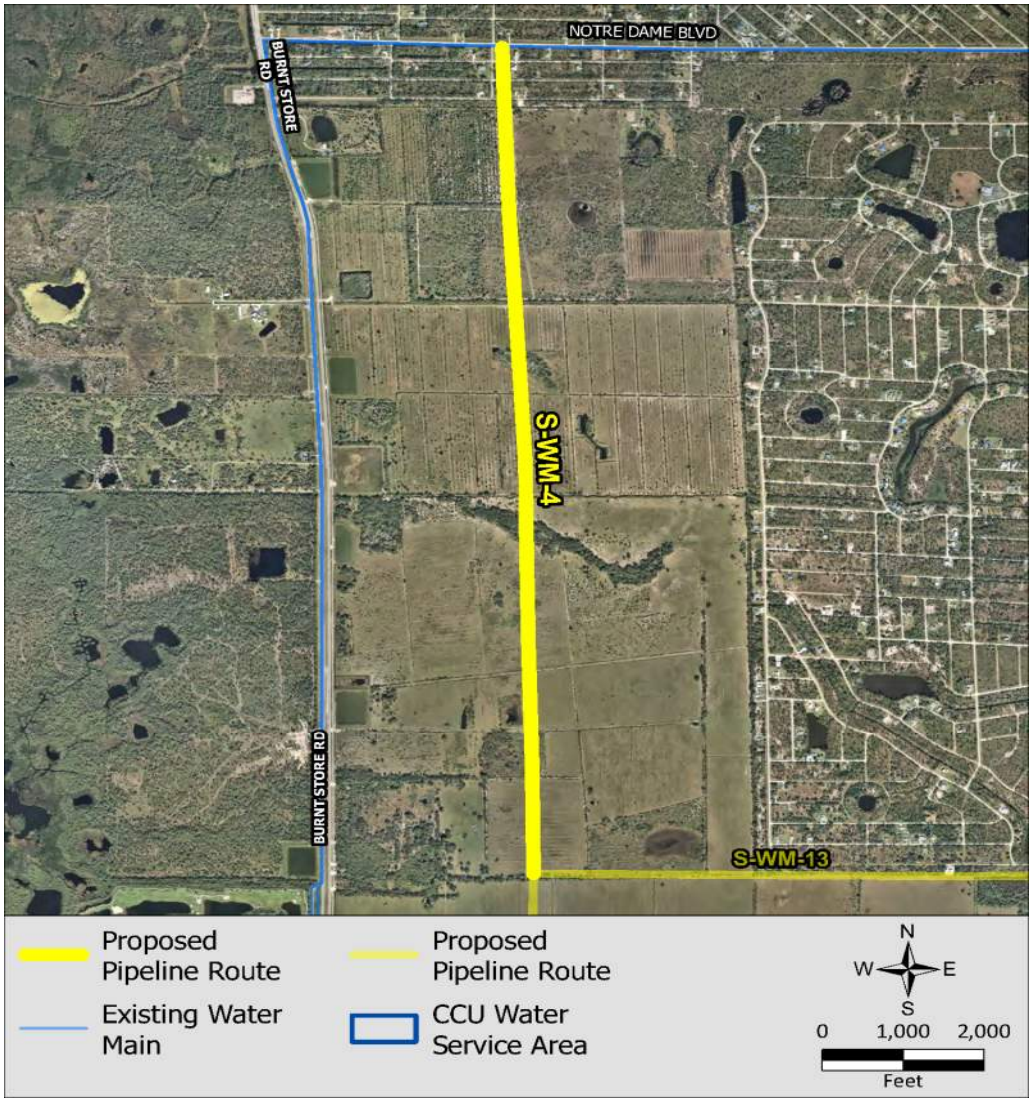
Project Type
Water Supply

Pipe Length
13120 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2023/24	2025/26	2027/28	2029/30	Total
Professional Services	135	100	30		265
Internal Costs					
Construction Cost		800	1,000	585	2,385
Other Fees and Costs					
Total Project Cost	**135**	**900**	**1,030**	**585**	**2,650**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-3 - Toledo Blade Blvd

Related CIP: None | **Project Area Served:** Lost Lagoon

Description: Install approximately 4,100 linear feet of 12-inch-diameter water main along Toledo Blade Blvd from US 41 to SR-776 to serve Lost Lagoon development.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
No

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Mid County

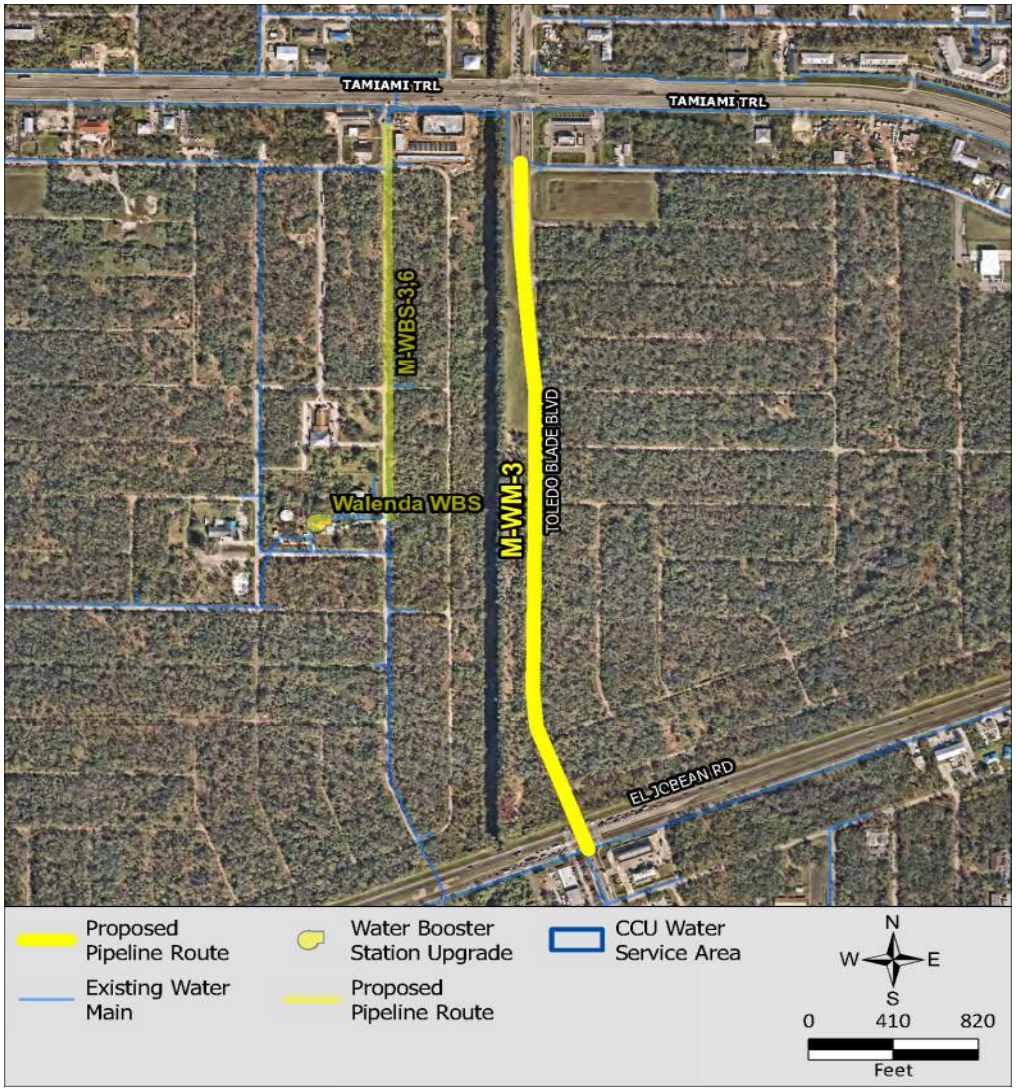
Project Type
Water Quality

Pipe Length
4100 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	82	24	16		122
Internal Costs					
Construction Cost		349	349		698
Other Fees and Costs					
Total Project Cost	**82**	**373**	**365**		**820**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WM-7 - Rotonda Blvd North

Related CIP: M-WM-18 | **Project Area Served:** West County

Description: Install approximately 41,190 linear feet of 36-inch water main from Gulf Cove WBS to Rotonda WBS. This pipe is proposed as a dedicated transmission main. Additional provisions should be made to isolate the proposed main from the Gulf Cove WBS to ensure simulataneous operations.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
West County

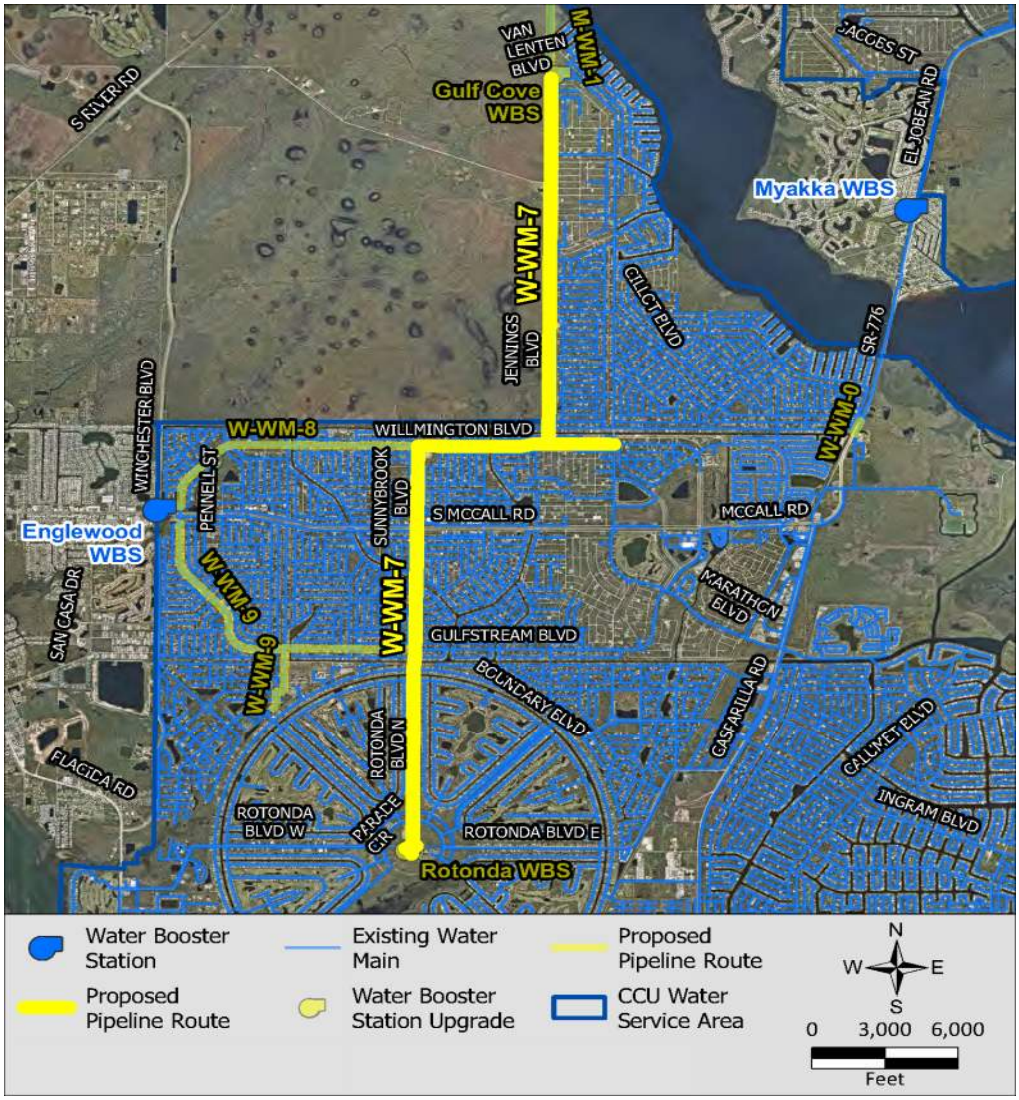
Project Type
Water Supply

Pipe Length
41190 feet

Pipe Diameter
36 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	2,554	766	511		3,831
Internal Costs					
Construction Cost		10,854	10,853		21,707
Other Fees and Costs					
Total Project Cost	**2,554**	**11,620**	**11,364**		**25,538**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-14 - South Green Gulf Blvd

Related CIP: W-WM-0 | **Project Area Served:** Northeast South County

Description: Install approximately 2,750 linear feet of 16-inch-diameter pipe parallel to Burnt Store Road connecting Shotgun Road and Los Lomas Drive.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location

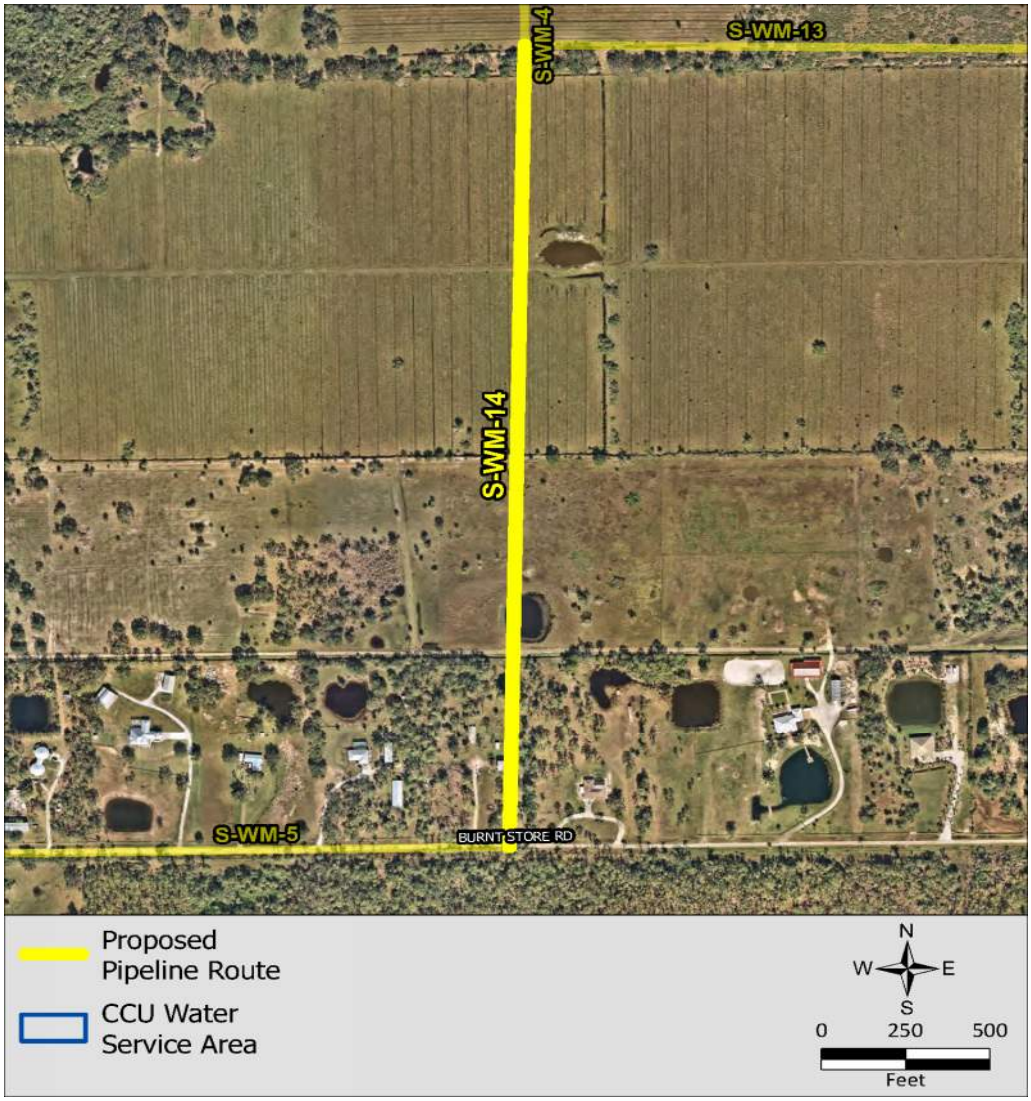
Project Type
Water Supply

Pipe Length
2750 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	88	26	18		132
Internal Costs					
Construction Cost		374	374		748
Other Fees and Costs					
Total Project Cost	**88**	**400**	**392**		**880**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-18 - Rio De Janeiro

Related CIP: None | **Project Area Served:** Deep Creek

Description: Install approximately 6,750 linear feet of 12-inch-diameter pipe along Rio de Janeiro Avenue from Rampart Boulevard to Harborview Road. The pipeline will connect to the existing Phase 1A PRMRWSA pipeline stub-out at Harborview Road.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2026
End: 2030

PROJECT DETAILS

Project Location
Mid County

Project Type
Water Quality

Pipe Length
6750 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2026	2027	2028	2029	Total
Professional Services	135	41	27		203
Internal Costs					
Construction Cost		574	573		1,147
Other Fees and Costs					
Total Project Cost	**135**	**615**	**600**		**1,350**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-2 - Tuckers Grade

Related CIP: S-WM-19 | **Project Area Served:** Tuckers Grade

Description: Install approximately 14,000 linear feet of 16-inch-diameter pipe along Tucker's Grade and along I-75.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2029
End: 2031

PROJECT DETAILS

Project Location
South County

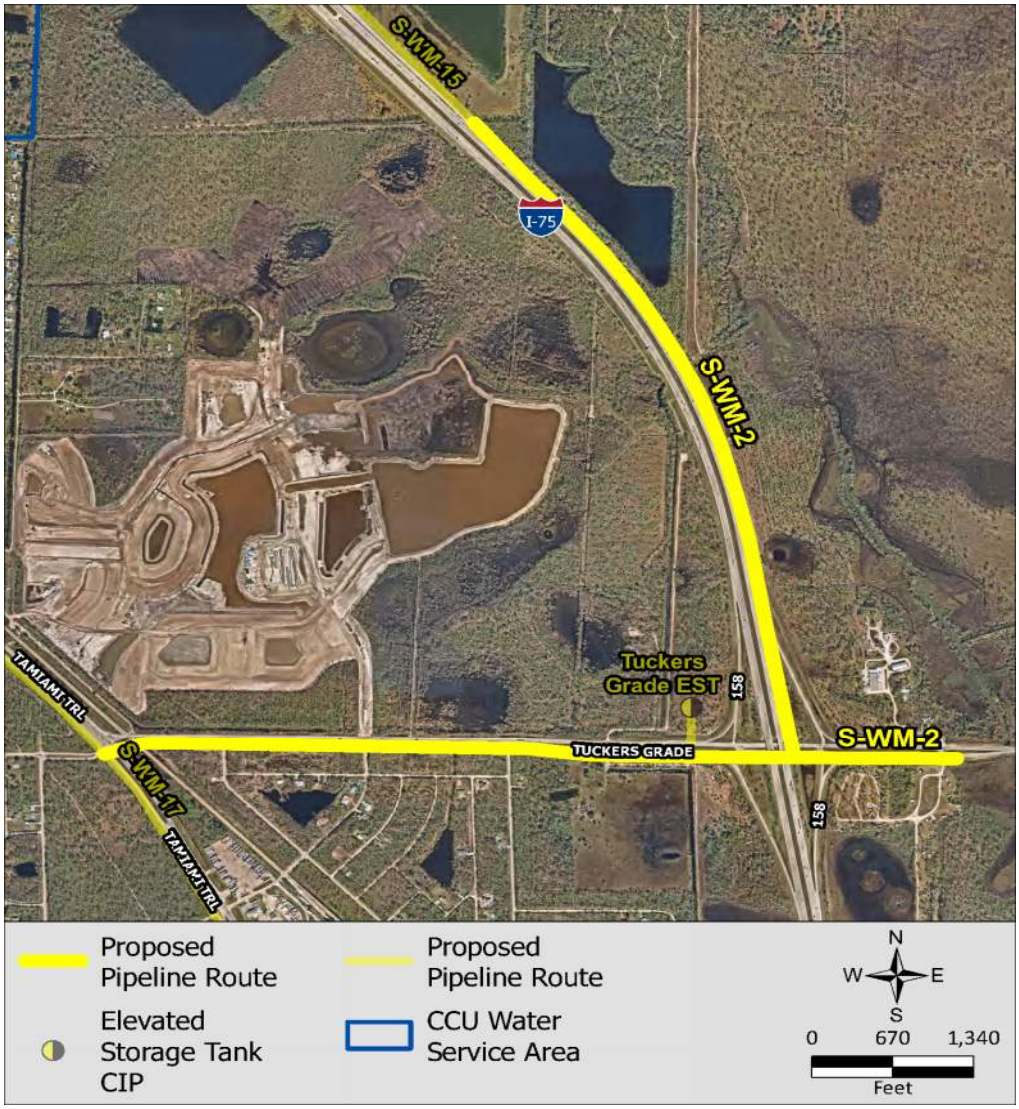
Project Type
Water Supply

Pipe Length
14000 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2028	2029	2030	2031	Total
Professional Services		300	100	50	450
Internal Costs					
Construction Cost		200	1,900	1,950	4,050
Other Fees and Costs					
Total Project Cost		**500**	**2,000**	**2,000**	**4,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-13 - Los Lomas Drive

Related CIP: M-WM-22 | **Project Area Served:** Northeast South County

Description: Install approximately 11,400 linear feet of 16-inch-diameter main along Los Lomas Drive.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2030
End: 2033

PROJECT DETAILS

Project Location
Burnt Store/South County

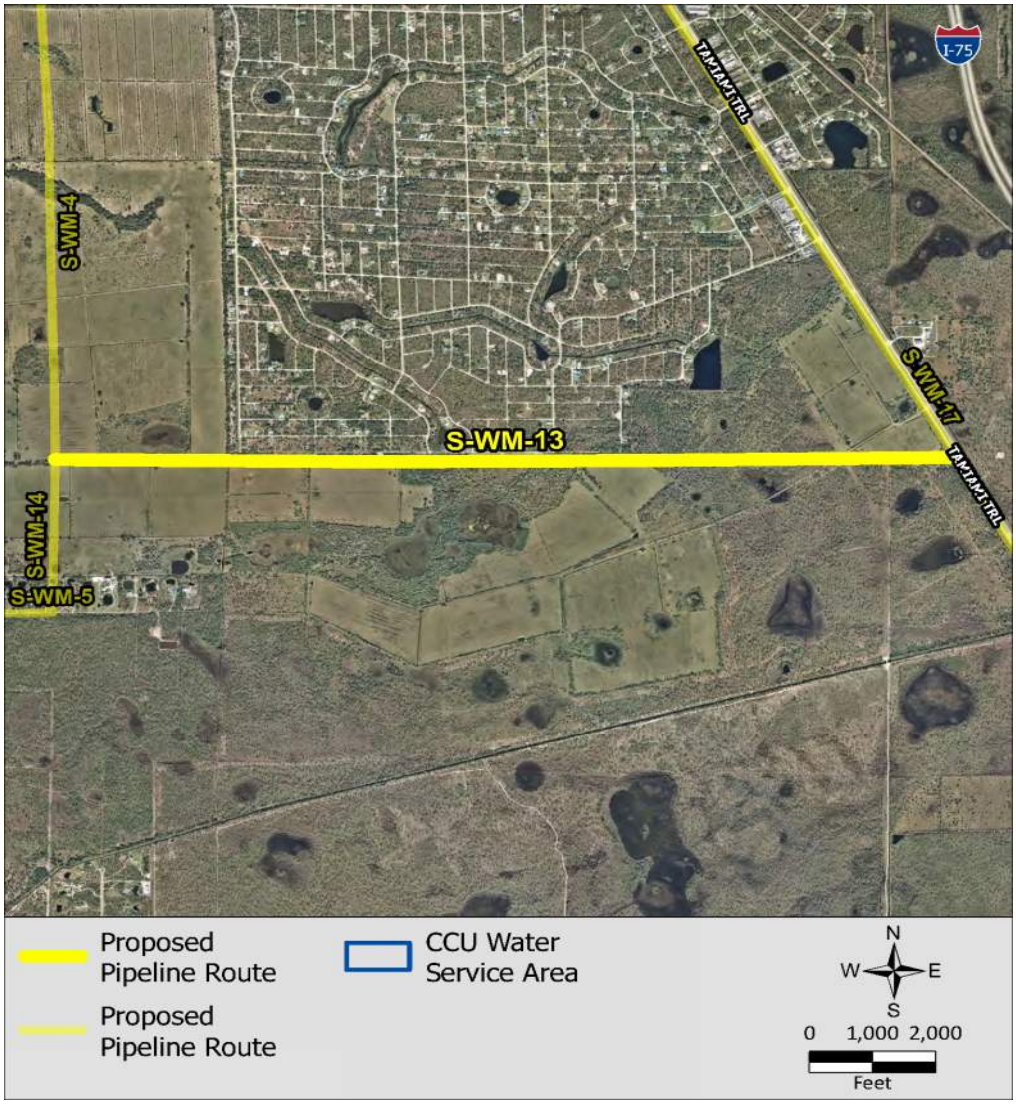
Project Type
Water Supply

Pipe Length
11400 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2030	2031	2032	2033	Total
Professional Services	400	100	48		548
Internal Costs					
Construction Cost	400	1,400	1,302		3,102
Other Fees and Costs					
Total Project Cost	**800**	**1,500**	**1,350**		**3,650**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WM-0 - MCCall Road Transmission Main Upgrade

Related CIP: None | **Project Area Served:** West County

Description: Install approximately 700 linear feet of 16-inch-diameter transmission main along McCall Road to connect the existing 16-inch main stubout at Gillot Blvd with the existing 18-inch main to the south.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
West County

Project Type
Water Supply

Pipe Length
700 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	22	8	4		34
Internal Costs					
Construction Cost		94	96		190
Other Fees and Costs					
Total Project Cost	**22**	**102**	**100**		**224**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WM-8 - Wilmington Blvd

Related CIP: W-WM-9 | **Project Area Served:** Englewood East

Description: Upgrade approximately 12,010 linear feet of 12-inch-diameter water main on Wilmington Blvd to Englewood WBS.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
West County

Project Type
Water Supply

Pipe Length
12010 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	240	72	48		360
Internal Costs					
Construction Cost		1,021	1,021		2,042
Other Fees and Costs					
Total Project Cost	**240**	**1,093**	**1,069**		**2,402**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-10 - Melbourne Crossing

Related CIP: S-WM-15 | **Project Area Served:** Ackerman

Description: Install approximately 700 linear feet of 6-inch-diameter water main under Melbourne Waterway.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☐ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
Mid County

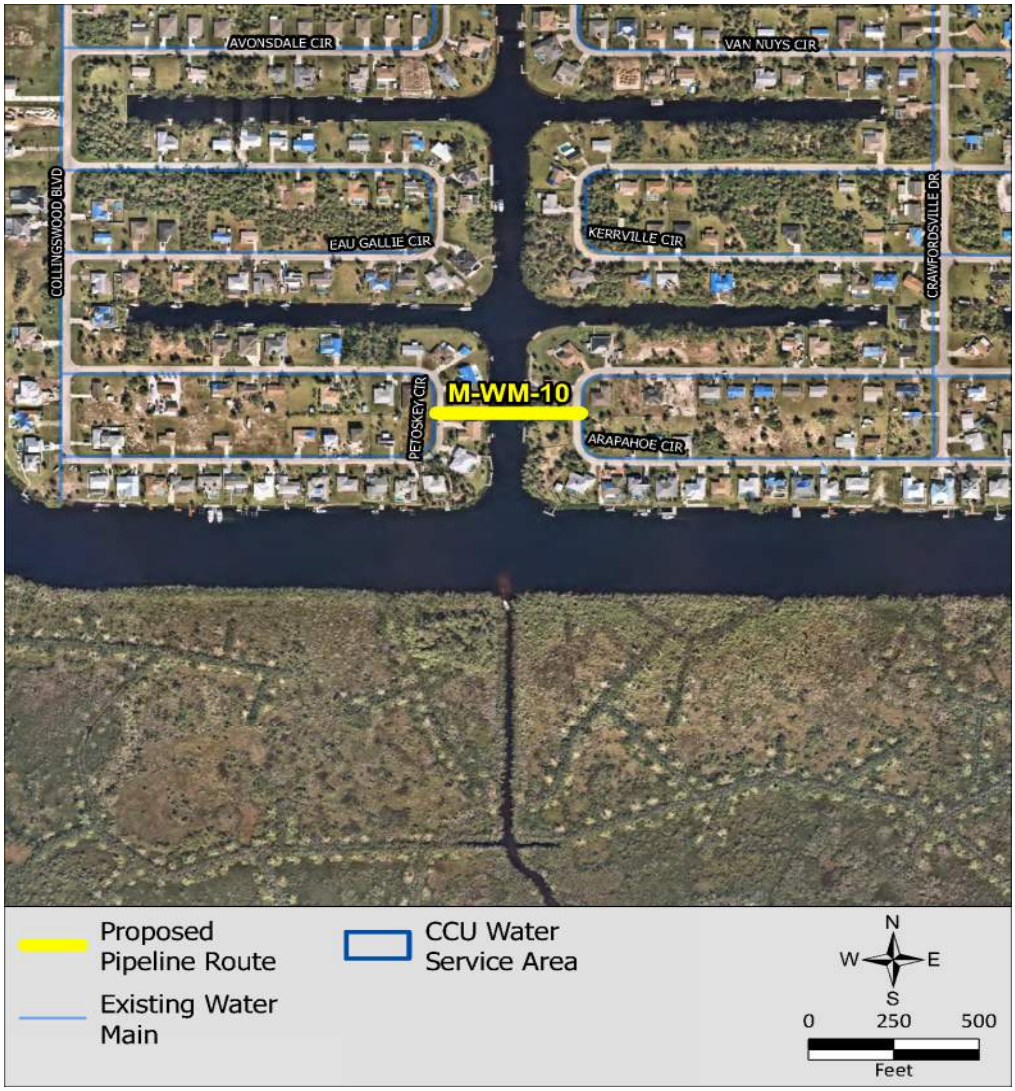
Project Type
Water Quality

Pipe Length
700 feet

Pipe Diameter
6 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	6	2	1		9
Internal Costs					
Construction Cost		27	27		54
Other Fees and Costs					
Total Project Cost	**6**	**29**	**28**		**63**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-11 - Ayrshire Crossing

Related CIP: S-WM-15 | **Project Area Served:** Ackerman

Description: Install approximately 1,800 linear feet of 6-inch-diameter water main under Ayrshire and Indianapolis Waterway.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☐ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
Mid County

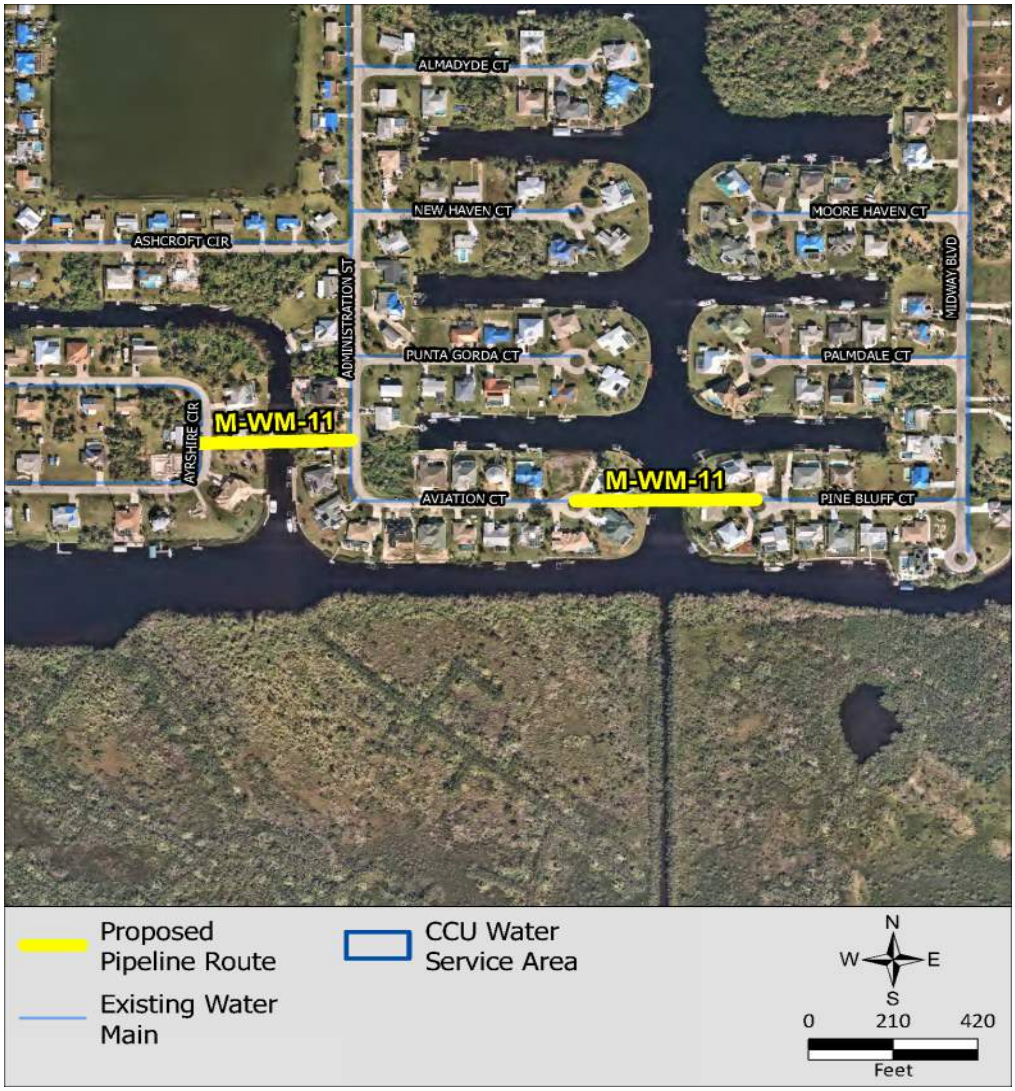
Project Type
Water Quality

Pipe Length
1800 feet

Pipe Diameter
6 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	16	5	3		24
Internal Costs					
Construction Cost		69	69		138
Other Fees and Costs					
Total Project Cost	**16**	**74**	**72**		**162**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WM-12 - Santa Cruz Crossing

Related CIP: M-WM-11 | **Project Area Served:** South Gulf Cove

Description: Install approximately 1,300 linear feet of 12-inch-diameter water main under the Santa Cruz Waterway along Calumet Blvd.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
South County

Project Type
Water Quality

Pipe Length
1300 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	25	7	5		37
Internal Costs					
Construction Cost		105	105		210
Other Fees and Costs					
Total Project Cost	**25**	**112**	**110**		**247**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-15 - Jones Loop

Related CIP: W-WM-12 | **Project Area Served:** Tuckers Grade

Description: Install approximately 10,900 linear feet of 16-inch-diameter main along Jones Loop Road.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
South County

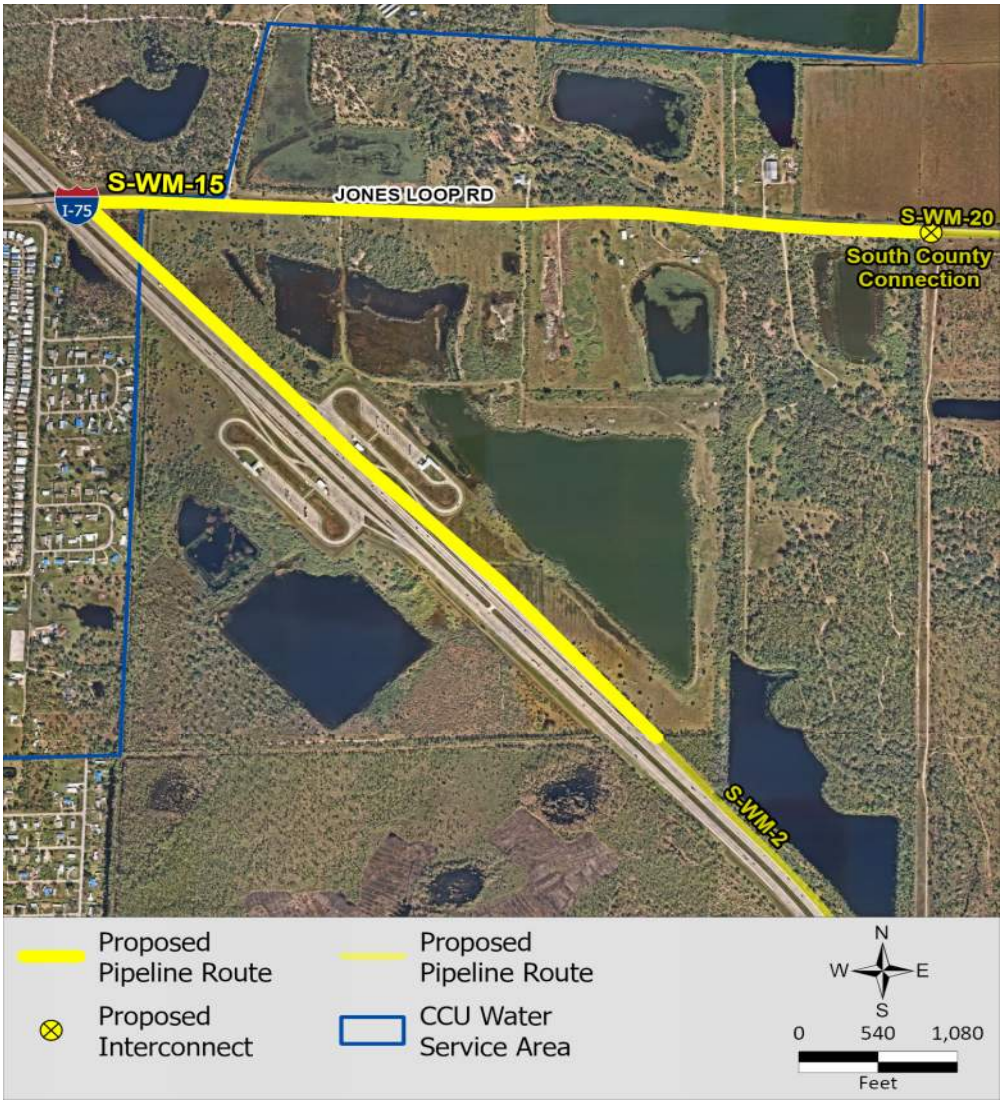
Project Type
Water Supply

Pipe Length
10900 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	350	105	70		525
Internal Costs					
Construction Cost		1,488	1,487		2,975
Other Fees and Costs					
Total Project Cost	**350**	**1,593**	**1,557**		**3,500**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: M-WM-22 - Posadas Circle Loop

Related CIP: None | **Project Area Served:** Deep Creek

Description: Install approximately 500 linear feet of 6-inch-diameter water main from Posadas Circle to Egret Place.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
No

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2031
End: 2035

PROJECT DETAILS

Project Location
Mid County

Project Type
Water Quality

Pipe Length
500 feet

Pipe Diameter
6 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study

Expenditure Plan ($1000)

	2031	2032	2033	2034	Total
Professional Services	6	2			8
Internal Costs					
Construction Cost		26	26		52
Other Fees and Costs					
Total Project Cost	**6**	**28**	**26**		**60**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: W-WM-9 - Gulfstream Blvd

Related CIP: W-WM-8 | **Project Area Served:** Englewood East

Description: Upgrade approximately 13,750 linear feet of 12-inch-diameter water main on Gulfstream Blvd from Englewood WBS.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☑ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
West County

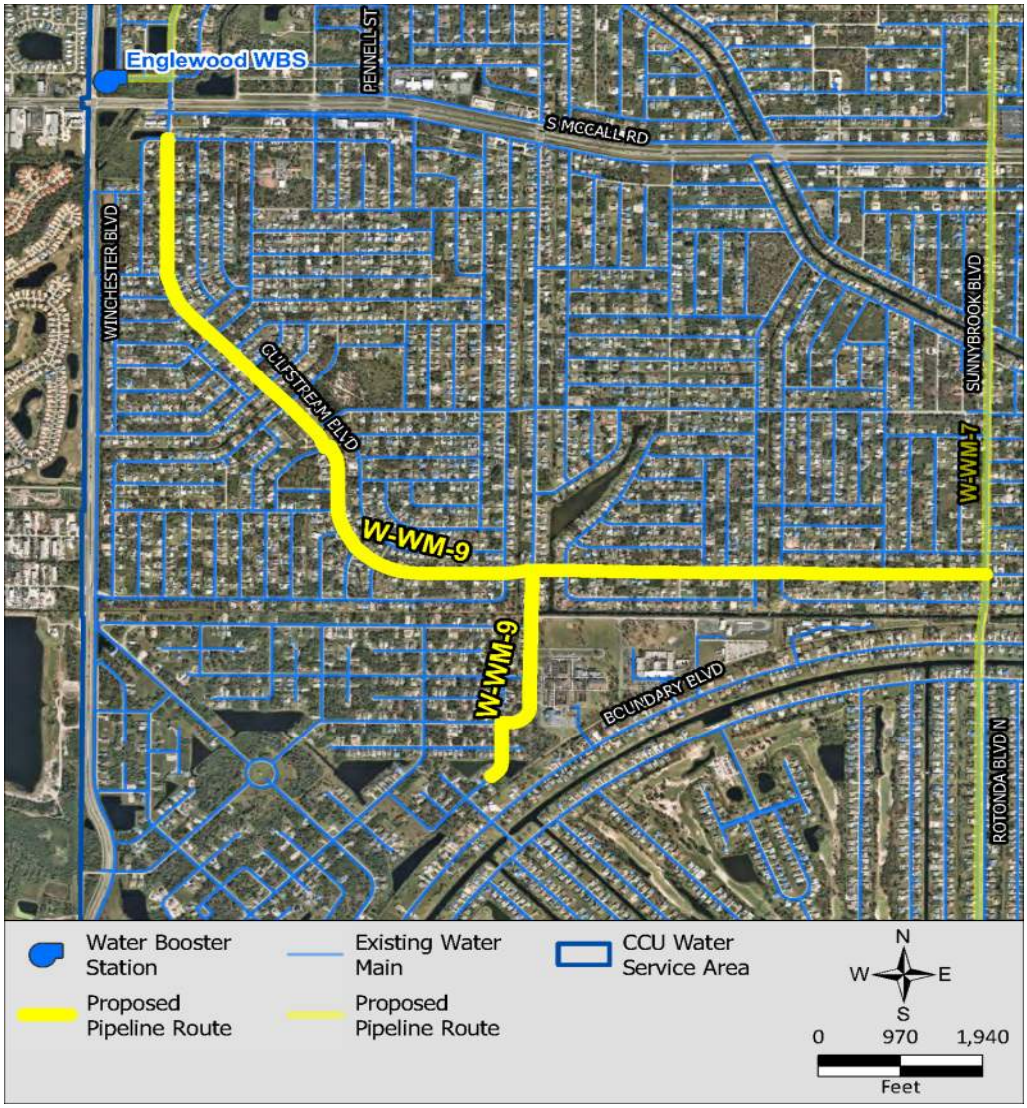
Project Type
Water Supply

Pipe Length
13750 feet

Pipe Diameter
12 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2036	2037	2038	2039	Total
Professional Services	275	83	55		413
Internal Costs					
Construction Cost		1,169	1,168		2,337
Other Fees and Costs					
Total Project Cost	**275**	**1,252**	**1,223**		**2,750**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-16 - Zemel Road

Related CIP: S-WTP-7 | **Project Area Served:** Southeast South County

Description: Install approximately 20,600 linear feet of 16-inch-diameter water main along Zemel Road.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
South County

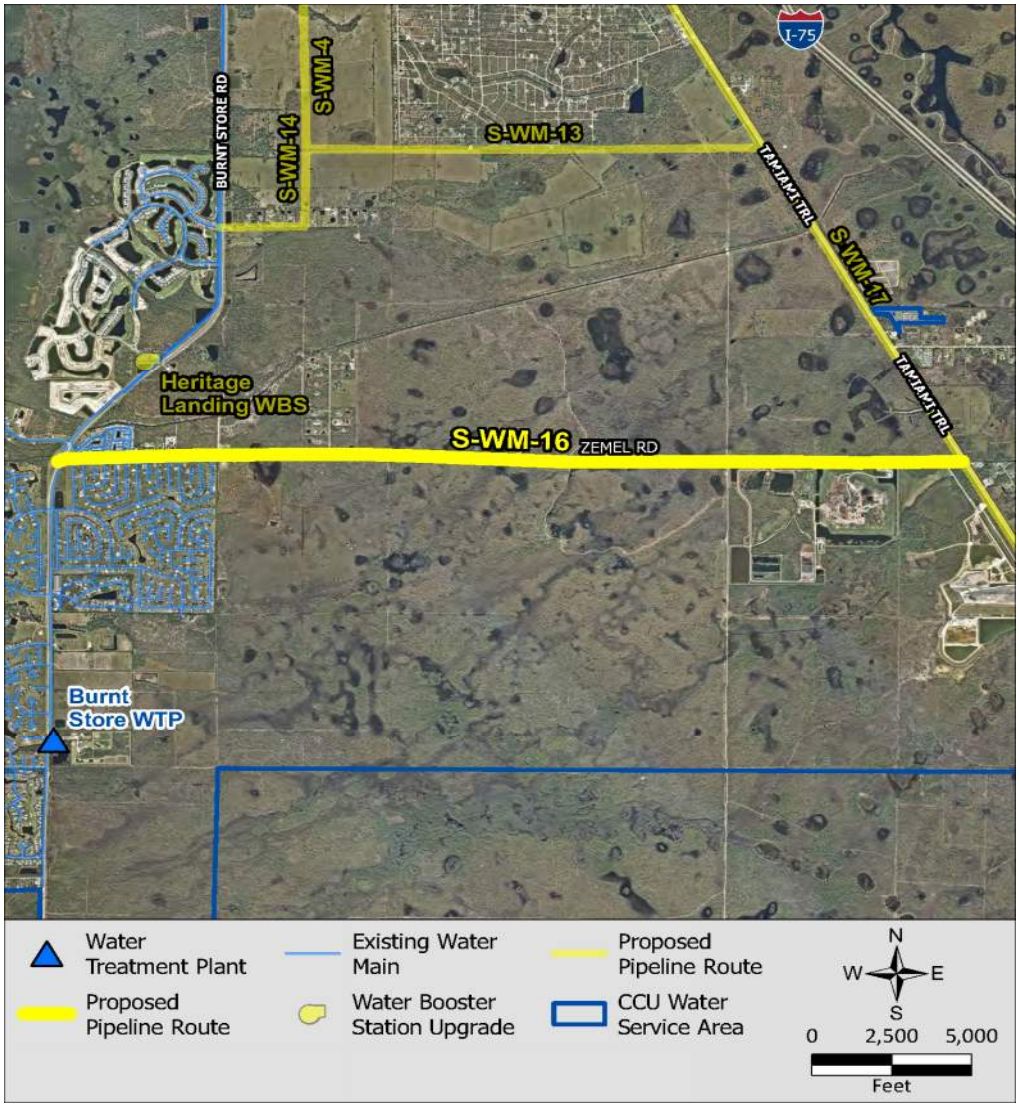
Project Type
Water Supply

Pipe Length
20600 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2036	2037	2038	2039	Total
Professional Services	659	198	132		989
Internal Costs					
Construction Cost		2,802	2,801		5,603
Other Fees and Costs					
Total Project Cost	**659**	**3,000**	**2,933**		**6,592**

(Costs expressed in 2023 dollars)

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: S-WM-17 - Tamiami Trail

Related CIP: M-WTP-0 | **Project Area Served:** Southeast South County

Description: Install approximately 26,170 linear feet of 16-inch-diameter water main along Tamiami Trail.

PROJECT IMPACTS

Does it add new capacity?
No

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: 2036
End: 2040

PROJECT DETAILS

Project Location
South County

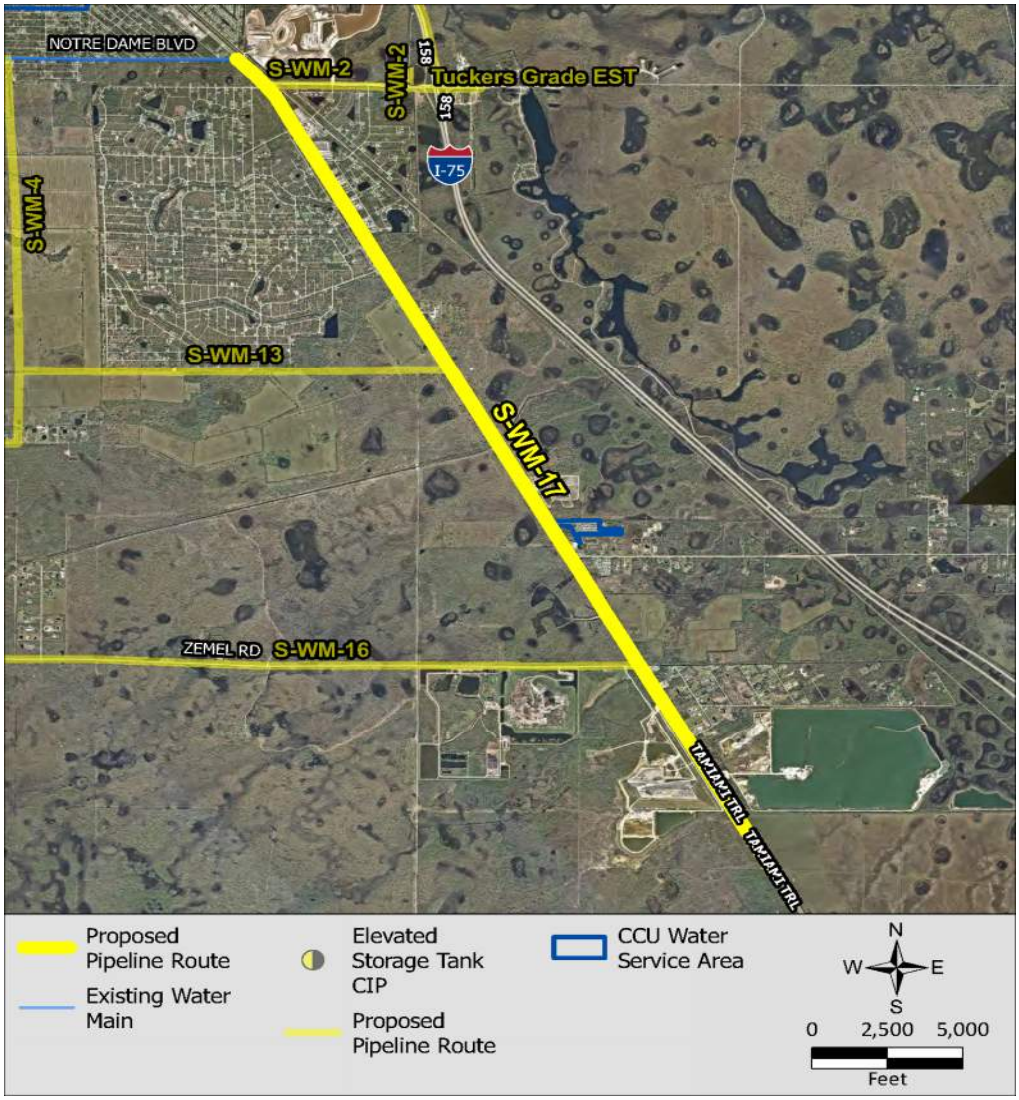
Project Type
Water Supply

Pipe Length
26170 feet

Pipe Diameter
16 inches

PROJECT COMPONENTS

- ☐ Water Treatment Plant
- ☐ Water Booster Station
- ☑ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	2036	2037	2038	2039	Total
Professional Services	838	251	168		1,257
Internal Costs					
Construction Cost		3,559	3,559		7,118
Other Fees and Costs					
Total Project Cost	**838**	**3,810**	**3,727**		**8,375**

(Costs expressed in 2023 dollars)

CIP Alternatives

CAPITAL IMPROVEMENTS PROJECT INFORMATION SHEET

Project Name: **M-WTP-0 - Alternative Water Supply Option: Increase PRMRWSA Allocation**

Related CIP: None | **Project Area Served:** Mid/West County

Description: Work with Peace River to reserve future allocation as needed to supplement Babcock Ranch water supplies. The cost provided for this Alternative CIP acts as a placeholder for CCU's reference and CIP planning purposes; the cost represents cost for development of PRMRWSA water supply projects (1) Reservoir No. 3 and PRMRWTF Expansion and (2) 5 MGD Brackish Water RO Plant. Combined, the estimated unit cost for these water supply projects, as discussed in PWMP Section 6.2, is approximately $24.6M per MGD. The cost below represents the estimated cost to reserve an additional 8.0 MGD.

PROJECT IMPACTS

Does it add new capacity?
Yes

Is it required to maintain LOS?
Yes

Does it increase resilience?
Yes

PROJECT NEED CRITERIA

- ☐ Safety
- ☐ Mandate
- ☐ Replace
- ☑ Growth

EST. CONSTRUCTION TIME

Start: TBD
End: TBD

PROJECT DETAILS

Project Location
County-wide

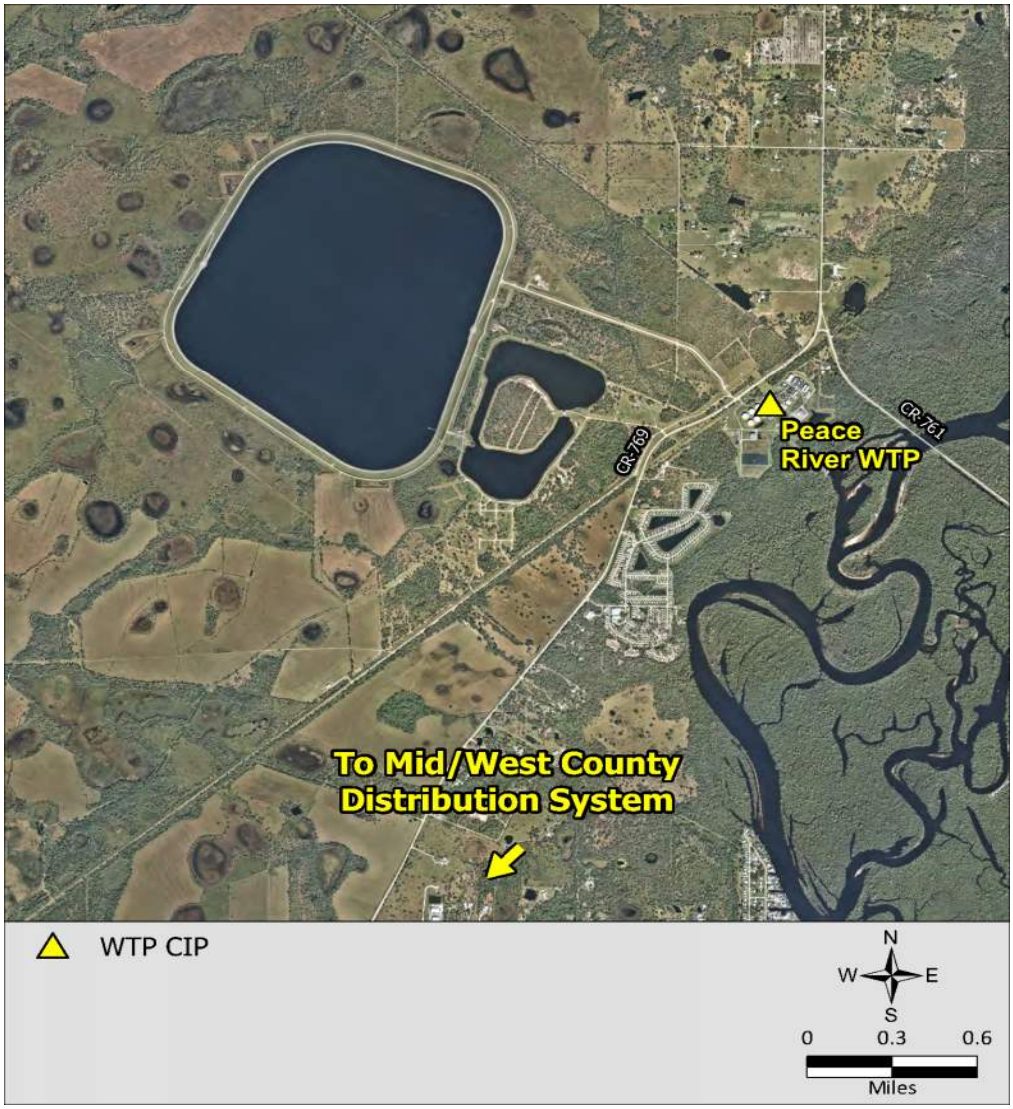
Project Type
Water Supply

Pipe Length
N/a

Pipe Diameter
N/a

PROJECT COMPONENTS

- ☑ Water Treatment Plant
- ☐ Water Booster Station
- ☐ Water Main
- ☐ Hydrants or Valves
- ☐ Water Storage
- ☐ Report / Study



Expenditure Plan ($1000)

	Year 1	Year 2	Year 3	Year 4	Total
Professional Services	19,680	5,904	3,936		29,520
Internal Costs					
Construction Cost		83,640	83,640		167,280
Other Fees and Costs					
Total Project Cost	**19,680**	**89,544**	**87,576**		**196,800**

(Costs expressed in 2023 dollars)

Attachment 1

Regional Water Supply Agreements

Return to:
Douglas Manson, Esq.
Carey, O'Malley, Whitaker & Manson, P.A.
712 S. Oregon Avenue
Tampa, Florida 33606

PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY
MASTER WATER SUPPLY CONTRACT

THIS CONTRACT, entered into this 5th day of October, 2005, by and between the **PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY**, a regional water supply authority created and existing pursuant to Sections 373.196, 373.1962 and 163.01, Florida Statutes, and other applicable law, acting by and through its Board of Directors, the governing board thereof ("Authority"); **MANATEE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Manatee"); **CHARLOTTE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Charlotte"); **DeSOTO COUNTY**, a political subdivision of the State of Florida, acting through its Board of County Commissioners, the governing board thereof ("DeSoto"); **SARASOTA COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Sarasota"); and the **CITY OF NORTH PORT**, a municipal corporation of the State of Florida, acting by and through its Board of City Commissioners, the governing board thereof ("North Port") (collectively "Customers").

WITNESSETH:

WHEREAS, the Authority was created for the purpose of developing, storing and supplying water for county and municipal purposes and exists pursuant to the Second Amended Interlocal Agreement Creating the Peace River/Manasota Regional Water Supply Authority executed concurrent with this Contract; and

WHEREAS, the Authority has determined that the potable water supply needs for citizens residing within Charlotte, Manatee, DeSoto and Sarasota Counties and North Port, can best be met in whole or in part by expanding the Authority Water Supply Facilities, in a cooperative and coordinated manner; and

WHEREAS, the Authority and the Customers agree it is necessary to expand the Peace River Regional Water Treatment Facility to be known as the Regional Expansion Program ("REP"), as more specifically set forth in Exhibit "G" and incorporated herein by reference in order to provide a total of 32.7 MGD of water to meet the water supply needs of the Authority's Customers; and

WHEREAS, it is the intent of the Parties that this Contract govern the operation, maintenance, alteration, replacement and expansion of the Authority Water Supply Facilities; and

WHEREAS, the Authority has applied and the Southwest Florida Water Management District ("SWFWMD") has provided New Water Source Initiative funds to assist in development and construction of the REP; and

WHEREAS, the Authority and its Customers recognize that as a result of increased Customers' demands, the REP will not satisfy all future Customers' demands and the Authority has begun developing other water supplies; and

WHEREAS, Manatee has adopted Resolution No. R-05-108 on June 7, 2005 conditionally requesting the development of potable water by the Authority for Manatee beginning January of 2014; and

WHEREAS, expansions to the Authority Water Supply Facilities and the design and construction of new Water Supply Sources may be financed for the Customer(s) through the issuance of Authority revenue bonds, capital contributions from the Customer(s), capital contributions from SWFWMD, or other governmental grants, or any combination thereof; and

WHEREAS, the Customers desire to purchase water from the Authority according to the terms and conditions of this Contract, and the Authority desires to provide the Customers water

according to the terms and conditions of this Contract; and

WHEREAS, recognizing the benefits provided by the REP and future Water Supply Sources, the Customers and the Authority agree that the Authority shall implement a common Debt Service Cost for the Water Rate only for the REP and all future Water Supply Source projects of the Authority; and

WHEREAS, the Customers desire that the Authority facilitate the transfer of Authority water among Customers, with such transfers being made through the Authority at the same Water Rate assessed by the Authority; and

WHEREAS, this Contract is intended to constitute the entire agreement of the Authority, Manatee, Charlotte, DeSoto, Sarasota and North Port with respect to the Water Allocations and the terms and conditions contained herein; and

NOW, THEREFORE, in consideration of the foregoing premises, which shall be deemed an integral part of this Contract and of the mutual covenants and agreements hereafter set forth, the Authority and the Customers intending to be legally bound hereby agree as follows:

1. **DEFINITIONS**. In the absence of a clear implication otherwise, capitalized terms used in this Contract and in the attached exhibits shall have the following meanings:

1.1 Annual Average Daily Quantity. The total water quantity provided by the Authority to a Customer in a Contract Year divided by 365 as set by its Water Allocation.

1.2 Authority. The Peace River/Manasota Regional Water Supply Authority.

1.3 Authority Board. The Authority's governing body.

1.4 Authority Water Supply Facilities. All real property, interest in real property, fixtures, personal property, wells, treatment systems, pumps, pipes, storage facilities, reservoirs, aquifer storage and recovery facilities, water transmission mains, any future expansion of said facilities and appurtenant or associated installations owned, leased or otherwise controlled by the Authority and used for the provision of potable water supply.

1.5 Available Water. That portion of a Customer's Water Allocation that is temporarily available to other Customers.

1.6 Base Rate Charge. For any Contract Year, the rate established by resolution of the Authority for payment of the Authority Obligations, Bond Coverage Costs, Debt Service Costs, Charlotte Oversized Facilities Payment, Capital Component Charge, Hydraulic

Pipeline Capacity Entitlement Cost and Renewal and Replacement Costs for the Authority Water Supply Facilities. The Base Rate Charge also includes the Fixed Operations and Maintenance Costs budgeted by the Authority for expanding, operating, repair and replacement, maintaining and securing the Authority Water Supply Facilities regardless of the quantity of water, if any, being produced or delivered by the Authority, with such fixed costs being assessed proportionately in accordance with the Annual Average Daily Water Allocation.

1.7 Bond Coverage Costs. The costs of providing the coverage requirements established by the Financing Documents.

1.8 Capital Component Charge. For any Contract Year, the charge established by resolution of the Authority for payment of the Capital Component Charge paid to Charlotte for the transfer of the Peace River Regional Water Treatment Facility. The Capital Component Charge shall be assessed by the percentages in Exhibit "F" for the Peace River Regional Water Treatment Facility.

1.9 Charlotte Oversized Facilities Payment. The 1991 Facility was stated to possess certain components that had a larger capacity than the 1991 Facility treatment capacity. Charlotte acquired the 1991 Facility then transferred to the Authority the entire 1991 Facility. However, payment for the oversized components was deferred until the Authority used these oversized components. Under the PRO and REP, the Authority will pay for all the remaining oversized components.

1.10 Conservation Rate. For any Contract Year, the charge established by resolution by the Authority to any Customer that exceeds its Water Allocation set forth in Exhibit "B".

1.11 Contract Year. The period between execution of the Contract and September 30, 2005, and each fiscal year of the Authority (beginning on each October 1, and ending on the immediately following September 30) thereafter during the term of this Contract.

1.12 Customers. Manatee, DeSoto, Charlotte, Sarasota and North Port.

1.13 Debt Service Cost(s). For any Contract Year, all costs including reserve or coverage requirement, if any, incurred by the Authority during such Contract Year in connection with the Authority Water Supply Facilities for principal payments, interest payments, redemption premiums, if any, and service charges with respect to payment of Obligations.

1.14 Delivery Point(s). The point(s) of connection between the Regional Transmission System and the distribution system of the Customers to this Contract having a Water Allocation. The Delivery Point(s) for each Customer is attached hereto as Exhibit "D."

1.15 DeSoto Payment. For any Contract Year, an amount included in the Water Rate, transmitted by the Authority to DeSoto in the amounts set forth on Exhibit "A" for the term of the Contract. The DeSoto Payment as defined herein supersedes the "Facility Use Cost" as defined in Section 1.8 of the Peace River Regional Water Supply Contract dated May 21, 1991.

1.16 Exclusive Provider Customer. A subset of Customers that includes only DeSoto in this Master Water Supply Contract.

1.17 Financing Documents. Any resolution or resolutions of the Authority, as well as any indenture of trust, trust agreement or similar document relating to the issuance or security of the Obligations.

1.18 Fixed Operating and Maintenance Costs. All operating and maintenance costs and expenses other than Variable Operating and Maintenance Costs incurred by the Authority for the operation, maintenance, management, security and development of the Authority Water Supply Facilities.

1.19 Hydraulic Capacity Entitlement. The Hydraulic Capacity Entitlement for the Regional Transmission System for each Customer is attached as Exhibit "E."

1.20 Hydraulic Capacity Entitlement Cost. The debt service cost associated with Customers' Hydraulic Capacity Entitlement.

1.21 Maximum Daily Quantity. The maximum water quantity to be provided by the Authority to a Customer for any given day as set by its Water Allocation.

1.22 Member Governments. Members of the Authority. This term refers jointly to Charlotte, DeSoto, Manatee and Sarasota.

1.23 MGD. Million gallons per day.

1.24 New Water Supply Demands. The new water supplies the Authority is committed by this Contract to develop and complete to meet Customer demands as shown on Exhibit "C" as updated annually pursuant to Section 11.

1.25 Obligation(s). A series of bonds or other evidence of indebtedness, including but not limited

to, Financing Documents, notes, commercial paper, capital leases or any other debt of the Authority issued or incurred.

1.26 Operating and Maintenance Cost(s). For any Contract Year, all costs budgeted and reserves established by the Authority for operating, maintaining and securing the Authority Water Supply Facilities during such Contract Year, including, but not limited to: a) personnel, staffing and operating costs of the Authority related to the operation, maintenance and security of the Authority Water Supply Facilities; b) the general and administrative costs of the Authority related to the operation, maintenance and security of the Authority Water Supply Facilities; c) minor capital expenditures of the Authority for items such as tools, parts, and other equipment and vehicles necessary for the operation, maintenance and security of the Authority Water Supply Facilities; and d) all costs incurred in obtaining and maintaining the Permits for the Authority Water Supply Facilities.

1.27 Party or Parties. Party shall mean a signatory to this Contract. Parties shall mean DeSoto, Charlotte, Sarasota, Manatee, North Port and the Authority.

1.28 Peace River Regional Water Treatment Facility (the "1991 Facility"). All real property, interest in real property, fixtures, personal property, wells, buildings, treatment systems, pumps, pipes, storage facilities, reservoirs, aquifer storage facilities and appurtenant or associated facilities located in DeSoto and Sarasota, which were transferred by Charlotte to the Authority pursuant to that certain "Acquisition Agreement" dated May 21st, 1991 by and among the Authority, Charlotte, DeSoto, Manatee, Sarasota and the Southwest Florida Water Management District and any expansion of said facilities undertaken pursuant to that certain "Peace River Water Supply Contract" dated May 21st, 1991 by and among the Authority, Charlotte, DeSoto, Manatee and Sarasota. The foregoing notwithstanding, this term shall not include the construction, acquisition or use of any groundwater production wells. "Groundwater production wells" shall not include facilities withdrawing water from the Peace River through the use of horizontal wells not more than 50 feet deep or aquifer storage and recovery wells.

1.29 Peak Month Average Daily Quantity. The total water quantity provided by the Authority during the calendar month of the Customer's highest water use, divided by the number of days in that month and expressed in MGD as set by the Customer's Water

Allocation.

1.30 Permits. All licenses, permits, authorizations or other approvals from any government or governmental agency, whether federal, state, regional or local, necessary or convenient for the acquisition, construction, expansion and operation of Water Supply Facilities and Water Supply Sources, including but not limited to any general water use permit, temporary water use permit or individual water use permit issued by the Southwest Florida Water Management District or any entity.

1.31 PRO. The Amended Peace River Option Water Supply Contract dated March 8th, 1996 that expanded the Peace River Regional Water Treatment Facility by adding 6 MGD annual average daily quantity of water to the System Capacity.

1.32 Redistribution Pool. A depository of each Customer's Available Water for any Contract Year for purchase by all Customers.

1.33 Regional Transmission System. Those facilities, including appurtenant and associated facilities, owned by the Authority pertaining to the delivery and measurement of potable water to the Customers of the Authority including but not limited to primary transmission pipes, real property, interest in real property, fixtures and personal property. Regional Transmission System does not include the Aquifer, Storage and Recovery ("ASR") system or its connecting piping.

1.34 Regional Water System. All real property, interest in real property, fixtures, personal property, wells, buildings, treatment system, pumps, pipes, storage facilities, reservoir(s), aquifer storage and recovery facilities and appurtenant or associated facilities owned by the Authority, excluding the Regional Transmission System.

1.35 Renewal and Replacement Charges. The charges established by the Authority for the exclusive purpose of funding renewals and replacements of the Authority Water Supply Facilities. The charges will be established to satisfy the requirements of the Authority's Obligations and shall be set forth in the annual budget approved by the Authority for the ordinary renewal, replacement, upgrade and betterment of the Authority Water Supply Facilities.

1.36 Renewal and Replacement Costs. The capital expenditures set forth in the annual budget approved by the Authority for the ordinary renewal, replacement, upgrade, and betterment of

the Authority Water Supply Facilities. Renewal and Replacement Costs do not include capital expenditures associated with the expansion or addition of water treatment, storage, pumping or transmission capacity or the costs associated with reconstruction of any major components of the Authority Water Supply Facilities.

1.37 Renewal and Replacement Fund. The fund established by the Authority for the exclusive purpose of funding renewals and replacements of the Authority Water Supply Facilities. The deposits to such fund shall be made in accordance with the requirements of the Financing Documents of the Authority. The balances on deposit in the Renewal and Replacement Fund will be expended for those Renewal and Replacement Costs specifically identified in the annual budget approved by the Authority.

1.38 Second Amended Interlocal Agreement. The Second Amended Interlocal Agreement Creating the Peace River/Manasota Regional Water Supply Authority executed concurrently with this Contract.

1.39 System Capacity. The total combined capacities of the various components of the Regional Water System in terms of a quantity of water on an average annual daily basis expressed in MGD.

1.40 Variable Operating and Maintenance Costs. All operating and maintenance costs and expenses of the Authority for the operation, maintenance and management of the Authority Water Supply Facilities that change in proportion to changes in the volume of water produced by the Authority, including, but not limited to, power, chemicals and water purchases.

1.41 Water Allocation. The portion of the System Capacity of the Regional Water System allotted to a Customer for the term of this Contract as initially specified at Exhibit "B" as increased from time to time pursuant to Section 11.

1.42 Water Rate. For any Contract Year, the rate established by resolution of the Authority for the sale of water, which, to the extent applicable, shall be comprised of a Base Rate Charge, the DeSoto Payment, and a Water Use Charge.

1.43 Water Supply Emergency. A loss or reduction in System Capacity caused by drought or a sudden, unexpected, unavoidable interruption in water delivery as declared by resolution by the Authority Board.

1.44 Water Supply Facilities. All real property, interest in real property, fixtures, personal property, wells, treatment systems, pumps, pipes, storage facilities, reservoirs, aquifer storage and recovery facilities, water transmission mains, any future expansion of said facilities and appurtenant or associated installations owned, leased or otherwise controlled by Charlotte, DeSoto, Manatee, North Port, Sarasota or the Authority and used for the provision of potable water supply.

1.45 Water Supply Source. Any project, construction, acquisition, transfer or transaction creating a new water source or expanding an existing water source developed by the Authority, Charlotte, Sarasota, Manatee, DeSoto or North Port.

1.46 Water Use Charge. For any Contract Year, the rate established by the Authority for payment of the Variable Operating and Maintenance Costs. This Water Use Charge shall be based on Customer metered water usage and shall be the same charge per thousand gallons used for each Customer.

2. **TERM**. The term of this Contract shall begin on the date of its complete execution by all Parties and end on the last day of the Contract Year in which the thirty-fifth (35th) anniversary of the execution date falls. The rights and obligations of any Customer may be extended prior to expiration of the initial term at the option of that Customer for another thirty-five (35) years, said extension to expire on the last day of the Contract Year in which the seventieth (70th) anniversary of the execution date falls. Such option must be exercised at least two (2) years prior to expiration. If during the Contract term, the Authority issues Obligations to construct additional System Capacity to provide additional or maintain existing Water Allocation of the Customers that is secured from the payments made by the Customers for service from the Authority and which repayment period extends beyond the termination date of the Contract as set forth above, the Contract will automatically be extended to include the last payment date of such additional Obligations. Before the expiration of this Contract, the Authority and Customers recognize that a new contract or extension of this Contract will need to be in place to provide ongoing water service from the Authority Water Supply Facilities and all Parties agree to work together in good faith to extend this Contract or create a new contract prior to this Contract's expiration date to meet the overall intent of the Authority to provide regional drinking water.

3. **AUTHORITY CAPACITY**. The Authority shall not be prohibited from maintaining

unallocated capacity of the Authority Water Supply Facilities.

4. **CONDITIONS PRECEDENT**. All rights, obligations and liabilities of the Authority and the Customers shall be subject to the satisfaction of the conditions precedent identified in Section 4.1.

4.1 Conditions Precedent. The following are conditions precedent to the Parties' rights, obligations and liabilities under this Contract:

4.1.1 The complete execution of this Contract by the Authority and the Customers.

4.1.2 The representations set forth in Section 8 are true and correct as of the date this Contract is fully executed by all Parties.

4.1.3 No change shall have occurred on or before the date this Contract is fully executed by all the Parties in any applicable federal, state or local law, or any applicable federal, state or local rule, regulation or ordinance thereunder, or an interpretation thereof by any applicable regulatory authority or court of competent jurisdiction, that would make the execution or delivery of this Contract, or that would make compliance by the Parties with the terms and conditions of said Contract or the consummation by the Parties of the transactions contemplated thereunder, a violation of such law, rule, regulations or ordinance.

4.1.4 The Authority and North Port shall execute a Settlement Agreement that requires North Port to file a Voluntary Dismissal with prejudice in *City of North Port v. Peace River/Manasota Regional Water Supply Authority*, Case No. 05-05254, Thirteenth Judicial Circuit in and for Hillsborough County, Florida within ten (10) days of execution of this Contract.

4.1.5 DeSoto and the Authority shall execute a transfer agreement pursuant to Section 21 herein.

4.1.6 Notwithstanding Paragraphs 8.4 and 10.5 herein, Charlotte and Sarasota shall establish a means to settle their disagreement over the "Water Sale and Purchase Agreement" between Charlotte and Sarasota dated March 8, 1996.

4.2 Satisfaction of the Conditions Precedent. The Parties shall exercise good faith and due diligence in satisfying the conditions precedent set forth above and the Authority shall give prompt notice to the other Parties when the foregoing conditions precedent have been

satisfied or waived in writing by all the Parties.

5. **FUNDING FROM THE FEDERAL ENVIRONMENTAL PROTECTION AGENCY ("EPA").** The funding from the EPA grant dated March 28, 1995 shall be used for the construction of the REP.

6. **INTANGIBLE ASSETS OF THE CUSTOMERS**. Each Customer's Water Allocation and Hydraulic Capacity Entitlement is an intangible asset of that Customer's utility system pursuant to the terms and conditions of the Contract.

7. **FUNDING FROM SWFWMD**. The funding from the SWFWMD New Water Sources Funding Agreements shall be used for the construction of the REP. All Parties shall work to obtain the maximum amount of funding from SWFWMD for the REP, any future expansion of or addition to the Authority Water Supply Facilities and new Authority Water Supply Sources.

8. **REPRESENTATION OF THE PARTIES**. The Authority, Manatee, Charlotte, DeSoto, Sarasota and North Port make the following representations:

8.1 Each Party is duly organized and existing in good standing under the laws of the State of Florida and is duly qualified and authorized to carry on the governmental functions and operations as contemplated by this Contract.

8.2 Each Party has the power, authority and legal right to enter into and perform its obligations set forth in this Contract, and the execution, delivery and performance hereof by it a) has been duly authorized by its governing board; b) does not require any other approvals by any other governmental officer or body; c) does not require any consent or referendum of the voters for Authority financed projects; d) will not violate any judgment, order, law or regulation applicable to the Party; and e) does not constitute a default under, or result in the creation of, any lien, charge, encumbrance or security interest upon the assets of the Party under any agreement or instrument to which it is a Party or by which the Party and its assets may be found or affected except as provided herein under Sections 16.5 and 16.6.

8.3 This Contract has been duly entered into and delivered by the respective governing boards and, as of the date of its full execution by all Parties, constitutes a legal, valid and binding obligation of said Party, fully enforceable in accordance with its terms provided the enforceability thereof may be limited by any applicable bankruptcy, insolvency, reorganization or other similar laws affecting creditors' rights generally, or by the exercise of

judicial discretion in accordance with general principles of equity.

8.4 There is no action, suit or proceeding, at law or in equity, before or by any court or governmental authority, pending or, to the best of the Party's knowledge, threatened against the Party which is not resolved by the execution of this Contract, wherein any unfavorable decision, ruling or finding would materially adversely affect the performance by the Party of its obligations hereunder or the other transactions contemplated hereby, or which, in any way, would adversely affect the validity or enforceability of this Contract, or any other agreement or instrument entered into by the Party in connection with the transaction contemplated hereby.

9. **REP CONSTRUCTION**. In consideration for financial and other commitments made by the Customers herein, the Authority agrees to permit and construct the REP as a necessary Water Supply Source for the Water Allocations. The cost of construction and construction schedule are attached as Exhibit "G". The Authority agrees to use its best efforts to construct the REP in accordance with the schedule set forth in Exhibit "G". The Customers recognize that the construction schedule may be affected by circumstances beyond the control of the Authority including, but not limited to, weather, availability of material and contractors, governmental approvals, and other force majuere. The Authority agrees to keep the Customers apprised of the progress made in construction of the REP and of any delays that may affect the scheduled completion date.

9.1. Cost of Construction. The Authority will use its best efforts to complete the REP construction project within the budgeted amount shown in Exhibit "G". The Authority will comply with its procurement procedures in the construction of the REP.

9.2. Insurance. The Authority shall require suitable payment and performance bonds from all principal contractors working on the construction of the project. The Authority shall further require the provision by the principal contractors of hazard insurance, general liability insurance, and worker's compensation insurance from such carriers and at such limits as are customary.

10. **DELIVERY OF WATER**. During each Contract Year, the Authority shall deliver water to each Customer in accordance with their Water Allocations and the terms and conditions of this Contract. Customers shall pay for and the Authority shall timely develop and deliver new Water

Supply Sources and facilities to meet the needs of its Customers as set forth in Sections 11 and 12 herein.

10.1 Allocation. The Authority shall be required to deliver water for a Customer's water demand from its Water Allocation. Future Water Allocations will be delivered only in accordance with a Customer's New Water Supply Demands in Exhibit "C" as modified by projected water demands pursuant to Section 11 herein. If a Customer meets its payment obligations to the Authority, the Authority shall have the absolute and unequivocal obligation to develop and provide for the Customer's permittable future potable water demand in its Water Allocation and New Water Supply Demands.

10.2 Limitation of Allocation. The Authority shall not be required to deliver water to a Customer if prohibited by any applicable federal, state, regional or local statute, rule, ordinance, law, administrative order or judicial decree or in violation of applicable Permits. If, at any time, there is insufficient potable water available to fully meet the Water Allocations described above for any reason, then the Customers shall have their Water Allocations reduced on a pro-rata basis.

10.3 Delivery Point. The Authority shall deliver water through the Regional Transmission System to each Customer only at their respective Delivery Point(s) as identified in Exhibit "D". Additional Delivery Point(s) may be added by mutual agreement of the Authority and receiving Customer(s).

10.4 Exceedance of Delivery Schedule. Subject to Section 10.5 herein, in the event a Customer should receive delivery of water in excess of its Peak Month Average Daily Quantity, its Maximum Daily Quantity, and/or its Annual Average Daily Quantity of its Water Allocation, the Customer shall pay a Conservation Rate as set forth in the Water Rate resolution. During emergency conditions as declared by resolution of the Authority Board, the Authority shall not charge the Conservation Rate for water delivery in excess of the Water Allocation.

10.5 Authority Water Transfers. Upon execution of this Contract by all Customers, all prior contracts transferring Authority water between any of the Customers shall terminate. All Authority water transfers shall be provided solely through the Authority. Notwithstanding the termination of the Water Sale and Purchase Agreement between Charlotte and Sarasota pursuant to this paragraph, both Charlotte and Sarasota hereby reserve and do not in any

manner waive any rights or causes of action that one may have against the other with regard to any past due obligations or debts arising out of said Water Sale and Purchase Agreement, to be resolved pursuant to Section 4.1.6. As part of the New Water Supply Demands process set forth below, each Customer shall annually provide to the Authority its projected Authority Water Demands for the next twenty (20) years. The Authority shall then determine the total Customer demands for Authority Water. The Authority shall determine the difference between each Customer's Water Allocation and projected water demands for the next ten (10) years on an annual basis. By February 15 of each year, the Authority shall provide each Customer with a Notice of Available Water indicating the amount of Water Allocation, if any, above the Authority's projected water demands for each of the next ten (10) years. Each Customer shall file a response with the Authority within thirty (30) days of receipt of the Notice of Available Water, either accepting the Available Water quantities as determined by the Authority or providing alternative Available Water quantities, if any, for each of the next ten (10) years. Failure of a Customer to respond within thirty (30) days shall result in that Customer's Available Water quantity as determined by the Authority, being transferred into the Redistribution Pool. Nothing herein shall be construed to require any Customer that timely responds to the Notice of Available Water to provide any of its Water Allocation to the Redistribution Pool. The Redistribution Pool shall be maintained by the Authority to provide the amount of Available Water by Contract Year for up to ten (10) years. Each year shall have a separate Redistribution Pool of water quantities designated. A receiving Customer's failure to pay for water transferred from the Redistribution Pool shall be treated as a default of this Contract. The Authority shall not transfer more water than the amount of Available Water placed in the Redistribution Pool. Nothing in this Section shall relieve a Customer from the irrevocable commitment to pay for its Water Allocations in this Contract.

10.5.1 Assignment and Payment. The Authority shall assign the Available Water based upon Customer request and written confirmation by their governing body of the corresponding payment obligations under this Contract. Customers may request Available Water from the Redistribution Pool for the corresponding timeframe of their need for additional water. If there is more

demand for water than there is Available Water in a given year, the Authority shall distribute the water on pro-rata basis based on the proportionate Customer demand in the New Water Supply Demands for the year at issue.

10.5.2 Payment. Payment adjustments to the Customers supplying Available Water shall be on a pro-rata basis, based on the percentage of water supplied to the Redistribution Pools for water sold from each Redistribution Pool.

10.5.3 Assessment of Conservation Rate. Only for purposes of calculating the assessment of the Conservation Rate, the Water Allocation of the Customer(s) receiving the Available Water and the Customer(s) providing the Available Water to the Redistribution Pool will be adjusted by the transferred water quantity.

10.6 Water Supply Emergency. The Authority and its Customers shall seek the interconnection of the Water Supply Facilities with other water supply facilities in the region and the Authority's Water Supply Facilities for the purpose of facilitating the transfer of water among the Authority and the Customers under emergency conditions. The Authority and its Customers shall make available capacity, if any, in their respective Water Supply Facilities to the Customers experiencing a Water Supply Emergency at the established rate of the supplying entity. In a Water Supply Emergency, Conservation Rates, inclining block rates, or excess demand charges of any type shall be waived by all Parties to this Contract for the duration of the declared Water Supply Emergency.

11. **FUTURE WATER SUPPLY PROCEDURE.** It is the intention of the Parties that this Section set forth the manner in which each Customer will request, and the Authority will provide, future water supply from the Authority Water Supply Facilities. The Customers acknowledge that a procedure is necessary to provide the Authority with sufficient lead-time for planning and development of new Water Supply Sources to meet New Water Supply Demands.

11.1 No later than January 15th of each Contract Year, each Customer shall submit to the Authority a report which identifies the following:

(i) Total projected water demand by Contract Year for the next 20 years ("Total 20 Year Demand");

(ii) That portion of the Total 20 Year Demand the Customer requires the Authority to fulfill ("Authority Supplied Water") in terms of Annual Average Daily Quantity, Peak Month Average Daily Quantity and Maximum Daily Quantity; and

(iii) The basis for each projection.

The Authority shall review, coordinate, and compile the submitted Total 20 Year Demand and Authority Supplied Water and provide such information to all Customers and the Authority Board. The Authority shall also report to the Customers and Authority Board, its estimation of water demand projections to be supplied by the Authority for its Customers on an annual basis for the applicable twenty-year planning period. The Authority shall use this data, as well as other population and water demand data, as a basis for the planning and development of new Water Supply Sources to meet New Water Supply Demands. Each Customer may modify its Total 20 Year Demand and projections for Authority Supplied Water with each subsequent annual filing, subject to the provisions in this Section.

11.2 By submitting its projections for Authority Supplied Water, each Customer is identifying that quantity of water it shall purchase from the Authority in the designated Contract Year. For the initial time period through Contract Year 2013, the New Water Supply Demands as modified at Exhibit "C" shall be the water each Customer irrevocably commits to purchase from the Authority, and the Authority agrees to supply such water. After Contract Year 2013, by submitting its projection for Authority Supplied Water each Customer agrees to purchase, and the Authority agrees to supply, that quantity of Authority Supplied Water identified in the first seven (7) Contract Years of the Total 20 Year Demand. Each Customer may annually update its Total 20 Year Demand and its projection of Authority Supplied Water. However, unless it otherwise has excess water capacity available, the Authority shall not be obligated to accept any change in demand for Authority Supplied Water within the upcoming seven (7) Contract Year period. Annually, the Authority shall issue an addendum to the Contract to update the New Water Supply Demands table at Exhibit "C" for the applicable years beyond Contract Year 2013 to reflect the first seven (7) Contract Years of projected demand for Authority Supplied Water by the Customers.

11.3 The parties acknowledge that the planning, permitting and construction of new Authority Water Supply Sources cannot exactly match the annual New Water Supply Demands. Therefore, the Authority will, from time to time, develop new Authority Water Supply Sources with water quantities that exceed immediate Customer demands. Upon the Authority determination to develop a specific Water Supply Source, the Authority shall assign a proportionate share of the new Water Supply Source Water Allocation to the Customers, to the extent practicable, by applying the new Water Supply Source project quantity to the most immediate New Water Supply Demands. The Authority shall assign Water Allocations to the Customers pro-rata based on their proportionate New Water Supply Demands at the time when the new Water Supply Source Water Allocation would be fully utilized by the total New Water Source Demand. For example, in year 2006, the Authority designates a new Water Supply Source project for 6 MGD to provide water by 2008. The total of New Water Supply Demands does not exceed 6 MGD until 2010, when it is 6.7 MGD. The Water Allocation assigned by the Authority to Customer A for the 6 MGD project is calculated by taking Customer A's New Water Supply Demand of 2.3 MGD for 2010 divided by the total of all the Customers' New Water Supply Demands of 6.7 for 2010 to determine the Customer Water Allocation Cost Percentage of 34.33%. When the Authority approves a new Water Supply Source project, it shall issue addendum to the following: (1) to increase and update the Water Allocation table at Exhibit "B;" (2) to update the Cost Allocation Percentages table at Exhibit "F" to show the new project's cost allocation percentages; and, (3) to update the table at Exhibit "H" to show the new project water quantity allocation. The Customers may only be assigned a Water Allocation for their New Water Supply Demands. All costs associated with a new Water Supply Source project, including, but not limited to, planning, design, and construction, shall be recovered from the Customer receiving the Water Allocations of the new Water Supply Source project.

12. **DESOTO DESIGNATION OF THE AUTHORITY AS ITS EXCLUSIVE PROVIDER OF WATER**. Notwithstanding the foregoing and pursuant to Section 8.1 of the Second Amended Interlocal Agreement, DeSoto elects to be an Exclusive Provider Customer. DeSoto agrees not to develop any additional Water Supply Sources beyond those currently existing identified in Exhibit "I" unless as a joint project with the Authority. If DeSoto meets its payment

obligations to the Authority, the Authority shall have the absolute and unequivocal obligation to develop and provide adequate potable water for DeSoto based upon its permittable future potable water demand as outlined herein. The Authority is free to meet DeSoto's water demands by any means it deems fit, including but not limited to using water from the Redistribution Pool or assignment of Water Allocation to meet DeSoto's demands and assigning the associated cost of constructing that portion of new Water Supply Sources to DeSoto as outlined herein.

12.1 Exclusive Provider Customer Water Allocation. DeSoto and the Authority agree that the current Water Allocation system must be adapted to assure that the Authority maintains its absolute and unequivocal obligation to provide adequate potable water for DeSoto and still assure that DeSoto pays its fair share of new water source development costs. For New Water Supply Demands, DeSoto has provided and agrees to continue to provide the Authority water demand projections in the same manner as other Customers pursuant to Section 11; however, the Authority shall use DeSoto's projections as well as other data collected by the Authority to set DeSoto's New Water Supply Demands for each Contract Year. DeSoto shall provide water demand projections in good faith and the Authority shall use its best efforts to match DeSoto's water demand to its assigned Water Allocation. This Water Allocation shall be used to determine DeSoto's Base Rate Charge and other share of costs in the same manner as all other Customers. Nothing in Section 12 shall allow the Authority to assign all or any portion of another Customer's Water Allocation to DeSoto.

12.2 Exclusive Provider Customer Water Allocation for the Redistribution Pool. The Authority may designate any portion of the DeSoto's Water Allocation as part of the Redistribution Pool.

13. **ALTERNATIVE DELIVERY.** The Authority shall consider alternative delivery, such as design-build, when developing new Water Supply Sources, including the REP.

14. **REFUNDING THE PRO BONDS.** The Authority shall issue Obligations to refund any and all debt outstanding and provide for the rights of bond holders for the PRO. Such refunding obligations shall be issued in an amount sufficient to provide for the payment of the principal of, redemption premium, if any, and interest on the outstanding debt to be refunded.

15. **SUPERSEDING AND REPLACING ALL PRIOR WATER SUPPLY CONTRACTS**. Upon full execution of this Contract and payment described in Section 14, this Contract shall supersede and replace the Amended Peace River Option Water Supply Contract dated March 8, 1996. Upon full execution of this Contract, this Contract shall supersede and replace all other water supply contracts with the Authority, including but not limited to the Peace River Option Water Supply Contract, dated September 20, 1995; the Peace River/Manasota Regional Water Supply Authority/City of North Port, Florida dated May 30, 1991; Peace River Water Supply Contract dated May 21, 1991; and the Acquisition Agreement dated May 15, 1991.

16. **WATER RATE**. For each Contract Year, each Customer with a Water Allocation from the Regional Water System shall pay the Authority the Water Rate adopted by resolution of the Authority Board.

16.1 Rate Setting. In conjunction with the Authority's annual budget development and adoption process, the Authority shall fix a Water Rate consisting of the Base Rate Charge (adjusted as necessary for customer financing), DeSoto Payment, and Water Use Charge to be paid on a monthly basis by the Customers for water furnished by the Authority. The Authority shall charge and collect rates that are reasonable and just for all Customers. The rates are not subject to the supervision or regulation by any other commission, board, bureau, agency or other political subdivision or agency of the county or state. Unless a common rate is established for all Debt Service Cost components of the Authority Water Supply Facilities, in determining a Customer's Water Rate, the Authority shall allocate to each Customer, a Base Rate Charge as follows: (1) the Base Rate Charge for 12 MGD 1991 Facility known as the Peace River Regional Water Treatment Facility pursuant to the 1991 Facility percentages set forth on Exhibit "F", (2) the 6 MGD PRO shall be allocated pursuant to the PRO percentages

set forth on Exhibit "F", and (3) the Base Rate Charge for the 14.7 MGD REP shall be allocated pursuant to the REP percentages set forth on Exhibit "F". All Debt Service Cost for new Authority Water Supply Sources and other costs associated therewith, such as reserves, coverages, expansion of existing water supply, or the fixed water purchase costs associated with a new Water Supply Source shall be combined with the REP Debt Service Cost for the common Debt Service Cost in the Water Rate. Provided, however, any Customer has the right to carry its own financing or pay in advance for their portion of a new Water Supply Source or expansion of the Authority Water Supply Facility and, in such event, the Debt Service Costs component of the Water Rate shall be adjusted accordingly.

16.2 Customer Financing. Each Customer shall have the option to issue their own debt or pay with its available money with respect to its portion of any new Authority Water Supply Source. The entire payment for a Customer's proportionate share shall be made to the Authority within fourteen (14) days of the Authority bond closing. The Authority shall provide notice to all Customers of the Authority bond closing date thirty (30) days prior to the Authority bond closing. To the extent not inconsistent with the Financing Documents, the Base Rate Charge for a Customer who issues its own debt or pays in advance for any such new Water Supply Source (including the REP) shall be adjusted to remove that Customer's Debt Service Costs attributed to the Customer's Water Allocation corresponding to the payment by the Customer for that new Water Supply Source or expansion.

16.3 Accounting, Audits and Adjustments. The Authority shall maintain accounts and records for all funds received and disbursed by it with respect to the Authority Water Supply Facilities in accordance with generally accepted accounting practices applicable to governmental owned and operated water utilities. On an annual basis, the Authority shall

provide for an audit to be conducted by a recognized certified public accounting firm experienced in water utility audits.

16.4 Joint Authority and Customer REP Review and Oversight. Each Party shall designate a staff representative for a joint Authority and Customer committee for the review and oversight of the REP design and construction activities. The Executive Director of the Authority shall be the Authority representative on the committee.

16.5 Water Charge to Customers. Each Customer shall pay the Authority its invoiced Water Rate and any applicable Conservation Rate charges on a monthly basis following the calendar month in which the charges were incurred and invoiced. The Customers shall submit payment to the Authority for the monthly charges within thirty (30) days of receipt of the invoice. Failure to pay monies shall create a debt with respect to the non-paying Customer's utility system. A Customer that fails to pay within ninety (90) days after the Authority has mailed its invoice shall be in default pursuant to this Contract. Upon thirty (30) days written notice, the Authority may discontinue delivery of water to any Customer in default for nonpayment and/or may transfer the defaulting Customer's Water Allocation in whole or in part to another Customer in good standing, for the remaining term of this Contract.

16.6 Source of Payments. Each Customer's obligation to pay any monies due under this Contract does not constitute general indebtedness. Neither the Authority nor the holders of any obligations issued by the Authority in order to finance or refinance the expansion, alteration, improvement, replacement or operation of the Authority Water Supply Facilities shall have a right to require or compel any Customer to exercise its ad valorem taxing power to pay its obligations and liabilities under this contract or to compel payment from any source other than as indicated in this Section. Each of the Customers, however, shall and do hereby

covenant to set water rates for its respective customers at a level sufficient to pay all monies due the Authority under this Contract.

16.7 DeSoto Payment. The Authority shall collect from its Customers in accordance with Exhibit "A", the DeSoto Payment and remit it to DeSoto. If the quantities of water allocated to the Authority under SWFWMD Water Use Permit Number 2010420.01 issued in 1996 for 32.7 MGD annual average water use are modified or if additional entities become Customers of the Authority, then the amount of the DeSoto Payment to be paid to DeSoto shall be readdressed by all Parties to this Contract.

17. **FUNDING FOR MANAGEMENT AND PLANNING.** It is acknowledged that Management and Planning Costs of the Authority may be obtained from the Customers in a manner determined by the Authority Board, and that additional funds available for Management and Planning Costs shall be sought by the Authority from the federal and state government, including but not limited to the Florida Department of Environmental Protection, Florida Department of Community Affairs, the Southwest Florida Water Management District, the Basin Boards of the Southwest Florida Water Management District, and appropriate utilities and agencies.

18. **PAYMENT TO CHARLOTTE FOR OVERSIZED FACILITIES.** Pursuant to prior contract provisions, payment is due to Charlotte for certain oversized facilities. Any Customer may prepay its portion of the Charlotte Oversized Facilities Payment directly to Charlotte, but must elect to do so on or before October 15, 2005 with immediate notice to the Authority and payment to Charlotte by November 30, 2005.

18.1 Payment for Oversized Facilities for the PRO. The PRO oversized facility payment was made to Charlotte in the amount of $3,191,883.00. When the PRO bonds are refunded, Customers other than Charlotte are to pay the Debt Service Cost on the remaining financed portion of the $3,191,883.00

with Sarasota paying 87.5% and DeSoto paying 12.5%.

18.2 Payment for Oversized Facilities for the REP. The Authority shall pay Charlotte all remaining oversized facility charges totaling $3,287,098.00 upon closing of the bond issuance for the REP. This payment is calculated as the total oversize facility charge of $4,515,864.00 less Charlotte's portion of 27.21% of the REP allocation percentage from Exhibit "F", or $1,228,766.00. All obligations to Charlotte for oversized facilities payment set forth in all previous contracts or agreements, including but not limited to, the Peace River Water Supply Contract dated May 21, 1991; the Amended Interlocal Agreement creating the Peace River/Manasota Regional Water Supply Authority dated May 21, 1991; and the Acquisition Agreement dated May 21, 1991, shall be satisfied upon receipt of the payment by Charlotte of the $3,287,098.00. The REP oversized facilities payment is to be paid by Customers other than Charlotte, and shall be based on the Debt Service Cost associated with financed portion of the oversized facilities payment to Charlotte of $3,287,098.00 for the REP and shall be allocated with Sarasota paying 85.62%, North Port paying 13.28% and DeSoto paying 1.1%.

19. **PAYMENT TO CHARLOTTE FOR PEACE RIVER REGIONAL WATER TREATMENT FACILITY ("1991 FACILITY")**. Upon payment of the $3,287,098.00 specified above, the Authority's total debt to Charlotte for the transfer from Charlotte of the 1991 Facility shall be $18,299,274.17 with the Authority annually paying $1,971,557.00 in equal installments on a monthly basis, with the last payment being on October 1, 2021. The redemption of this debt shall be governed by Exhibit "J". The Authority's payment to Charlotte for the 1991 Facility shall be allocated among DeSoto, Charlotte and North Port pursuant to the 1991 Facility cost allocation percentages set forth on Exhibit "F". This payment schedule shall supersede and replace any prior agreement, contract or other document for any payment or Obligation to Charlotte for transfer of the

1991 Facility or any other assets, real estate, facilities or any other property or service to the Authority prior to the date of this Contract.

20. **NORTH PORT PAYMENT TO CHARLOTTE.** Pursuant to the Peace River/Manasota Regional Water Supply Authority/City of North Port, Florida Water Supply Contract dated May 30, 1991, Charlotte reserved water capacity for a period of time for North Port. North Port was then obligated to repay the cost of the water reservation to Charlotte. Payment by North Port through the Authority to Charlotte has been made since 1992 at a monthly amount of $398.42. Since the Master Water Supply Contract supersedes the Peace River/Manasota Regional Water Supply Authority/City of North Port, Florida Water Supply Contract dated May 30, 1991, this North Port obligation is established in this Contract. North Port shall pay the Authority $398.42 monthly with the last payment on October 1, 2021. The Authority shall pass through the payment being made to Charlotte each month.

21. **TRANSFER OF DESOTO FACILITY.** Provided a transfer agreement is executed by DeSoto and the Authority, the Authority shall pay DeSoto $800,000.00 for DeSoto to transfer to the Authority the real property and water well, appurtenances and any necessary permits for use of the water well and specified facilities in place identified in the transfer agreement. This payment from the Authority shall be funded from REP Debt Service Cost. The payment to DeSoto will be in the form of a credit for DeSoto's payment obligation pursuant to the DeSoto County Regional Pipeline Extension Amended Pipeline Agreement dated June 21, 2004.

22. **DEVELOPMENT OF FUTURE WATER SOURCES.** The Authority and its Customers shall develop new Water Supply Facilities as follows:

22.1. General. The Authority shall develop new Authority Water Supply Facilities to meet the water demands of its Customers in Exhibits "B" and "C" which will reflect the projections

provided as specified above or at the determination of the Authority for DeSoto.

22.2 Procedures for New Authority Water Supply Facilities. The Authority shall have written consent of the governing body of a Customer in whose jurisdiction the Authority intends to acquire, develop, construct or operate new Authority Water Supply Facilities. For new Authority Water Supply Facilities located or proposed to be located within the jurisdiction of North Port, North Port shall be the sole entity that grants or denies consent to the Authority.

22.2.1. The Authority shall provide written notification of its intention to apply or seek the transfer of a Permit for new Authority Water Supply Facilities to the Customer in whose jurisdiction the Authority Water Supply Facilities are located or will be located. Such notification shall be given no less than sixty (60) days prior to submitting the Permit application or requesting the Permit transfer. The Customer shall notify the Authority within sixty (60) days of its decision to grant or deny consent to the Authority to acquire, develop, construct or operate the new Authority Water Supply Facilities within its jurisdiction. If a Customer denies consent, the Customer's notification shall provide an explanation of the reasons for denial.

22.2.2. Upon notification of denial by a Customer to the Authority, a meeting between the staff of the Authority and the Customer shall be held within forty-five (45) days of the notification of denial. This meeting shall be organized and scheduled by the Authority. During this meeting, the staff of the Authority and the Customer shall attempt to reach an agreement to grant consent to the Authority to acquire, develop, construct or operate new Authority Water Supply Facilities within the Customer's jurisdiction.

22.2.3. If no agreement is reached within forty-five (45) days of notification of denial, the Authority and the Customer shall participate in mediation, the costs of which shall be equally divided between them. The Authority and the Customer shall endeavor in good faith to select a mutually acceptable mediator. If the Authority and the Customer are unable to mutually agree on a mediator within fourteen (14) days after the staff meeting held pursuant to paragraph 22.2.2., the Authority and the Customer shall agree to accept a mediator selected by the Florida Conflict Resolution Consortium. Upon the selection of a mediator, the Authority and the Customer shall schedule mediation to occur within fourteen (14) days. Mediation shall be completed within forty-five (45) days of the first mediation conference unless extended by mutual written agreement of the Authority and the Customer. Subsections (b), (c), (d), and (e) of Rule 1.720 of the Florida Rules of Civil Procedure are applicable to the mediation proceedings. Designees of the Authority and the Customer attending the mediation shall include a governing body member who has the full authority to negotiate on behalf of its entity and to recommend an agreement to its governing body. In the event of any breach or failure to perform mediation under this section, the Authority or Customer may seek appropriate remedies to mandate this mediation process.

22.2.4 If consent to the Authority by a Customer is not agreed to at the mediation, the Authority shall withdraw the Permit application or request for Permit transfer.

22.3 Procedure for the Authority's Customers. Whenever a Customer ("Applicant Customer")

intends to apply or seek the transfer of a Permit for Water Supply Facilities located or that will be located within the jurisdiction of another Customer, the Applicant Customer shall provide written notification of its intention to apply or seek the transfer of a Permit for Water Supply Facilities to the Customer ("Host Customer") in whose jurisdiction the Water Supply Facilities are located or will be located. Such notification shall be given no less than sixty (60) days prior to submitting the Permit application or requesting the Permit transfer. The Host Customer shall notify the Applicant Customer within sixty (60) days of its decision to grant or deny consent to the Applicant Customer to acquire, develop, construct or operate the Water Supply Source within its jurisdiction. If a Host Customer denies consent, the Host Customer's notification shall provide an explanation of the reasons for denial. The Applicant Customer shall immediately withdraw its Permit application or request for transfer of a Permit upon notification of denial by the Host Customer.

23. **HYDRAULIC CAPACITY ENTITLEMENT IN REGIONAL TRANSMISSION SYSTEM**. Each Customer shall be provided its respective Hydraulic Capacity Entitlement of the hydraulic capacity in the transmission facilities that has been constructed at the time of execution of this Contract or will be constructed by the Authority during the term of this Contract for the benefit of such Customer(s) to deliver potable water from the Regional Water System to the respective Customer(s) Delivery Point. Each Customer's Hydraulic Capacity Entitlement percentage or amount in the current Regional Transmission System is set forth on Exhibit "E". A Customer's Hydraulic Capacity Entitlement in segments of the Regional Transmission System constructed after the date of this Contract will be determined on a transmission line segment basis by the Authority. All Hydraulic Capacity Entitlement Cost of the Hydraulic Capacity Entitlement will by the sole responsibility of the Customer(s) benefiting from such facilities. If more than one Customer uses the

same transmission segment as designated by the Authority, then each shall pay their proportionate share of the Hydraulic Capacity Entitlement Cost.

23.1 In the event a Customer requests capacity in a transmission line segment that is an existing component of the Regional Transmission System, and the capacity percentage of which has been fully allocated, the Authority shall not grant capacity to the requesting Customer without first obtaining approval from the Customer(s) to whom the hydraulic capacity in that transmission line has previously been allocated. In the event the Authority modifies the Hydraulic Capacity Entitlement, the application of all future service rates and charges will be adjusted accordingly.

23.2 If requested by North Port, the Authority shall construct, and North Port shall pay for its proportional share of the Hydraulic Capacity Entitlement Cost of a new segment of the Regional Transmission System between Delivery Points identified by North Port and acceptable to the Authority on the basis of system hydraulics. The Authority and North Port may agree to a water delivery alternative utilizing the existing stub-outs along the 42-Inch RTS (2) transmission main identified in Exhibit "D", subject to the change of apportionment of Hydraulic Capacity Entitlement Cost on terms mutually agreeable to North Port, Sarasota and Authority.

24. **ADDITIONAL REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE AUTHORITY.** The Authority hereby represents, warrants and covenants to the Customers as follows:

24.1 System Operation. Operation and maintenance of the Authority Water Supply Facilities shall be the responsibility and the obligation of the Authority. The Authority shall be responsible to adopt an adequate budget to pay all of the Operating and Maintenance Costs of the

Authority, to satisfy all the Authority's Obligations, to provide for the requisite Bond Coverage Costs to meet all required tests set forth in the Financing Documents, to provide for renewal and replacement costs to keep the Authority Water Supply Facilities in good operating order and to provide for any sinking funds and other reserves necessary to provide the water service as set forth in this Master Water Supply Contract. The Authority shall provide sufficient personnel, with appropriate experience to undertake all regulatory requirements, including, but not limited to, those imposed by the Florida Department of Environmental Protection, the Southwest Florida Water Management District, the State of Florida Department of Health and the United States Environmental Protection Agency. If new regulatory requirements necessitate capital improvements or budget amendments, the Authority shall take all necessary actions to accomplish the same. The Authority shall be responsible for all regulatory violations including compliance costs or penalties assessed for same, which arise out of or are solely created through: (1) material errors or omissions by its personnel and agents in the day-to-day operations of the Authority Water Supply Facilities; or (2) the failure of the Authority to timely proceed administratively to undertake or complete a requirement imposed by any regulatory agency in any consent order or operating permit. The Authority shall maintain adequate catastrophic insurance on the Authority Water Supply Facilities on such terms and amounts as established by the Authority.

24.2 Water Quality. The Authority shall use its best efforts to deliver water of good and uniform quality from the Authority Water Supply Facilities to the Delivery Point(s). The water delivered by the Authority to the Delivery Point(s) shall be stabilized and shall meet all federal, state or regional regulations and orders relating to drinking water, which are applicable to water produced, stored and transported at and through the Authority Water

Supply Facilities.

24.3 Water Measurement. The Authority shall use its reasonable efforts to measure all water delivered to the Delivery Point(s) of Customers. The Authority shall own and maintain the meters at all Delivery Point(s). The Authority shall maintain complete and accurate records of its water measurements. Water flow measurements recorded by the Authority shall be the exclusive means of determining the quantity of water delivered to the Delivery Point(s) under this Contract. The metering equipment shall be of standard make and type, installed at a readily accessible location, and shall record flow with accuracy sufficient to meet all applicable reporting requirements. The Authority will check the accuracy of the meters annually, provide a report regarding the condition, accuracy and state of the meters and provide for a certified calibration test and any appropriate recalibration. Upon request and at the expense of the Customer, the Authority shall make arrangements for a meter test to be conducted by an independent testing facility who shall conform to the manufacture's standards and where appropriate conduct the test as a field test. The Customers may be present when the meters are checked for accuracy, and the test records shall be made available for inspection by the Customers upon reasonable request. If the accuracy of the meter is determined to be at least four (4) percent beyond the limits prescribed by the manufacturer, the meter will be assumed to have been inaccurate from the mid-point of the time since the last annual inspection, or the last calibration, or the last independently certified test, or the last six (6) months whichever is less. The following month's billing will be adjusted taking into account the nature of the inaccuracy to show a credit or additional charge to the respective Customer for the metered flow for that period.

24.4 Permits. The Authority shall use its best efforts to obtain all Permits necessary to provide

the Customers with water in accordance with the Water Allocations, New Water Supply Demands and its duty to its Exclusive Provider Customer(s).

24.5 Financing the Authority Water Supply Facilities. The Authority shall use its best efforts to borrow funds and to set adequate reserves and budgeted expenditures necessary to cover costs to be incurred in constructing, acquiring, operating, maintaining, repairing, replacing or upgrading the Authority Water Supply Facilities.

24.6 Acquisition of Real Property. The Authority shall use its best efforts to acquire all interest in real and personal property (if any) necessary for the expansion, construction, management and operation of the Authority Water Supply Facilities. The Authority shall retain in its own name any interest in real property acquired in connection with the Authority Water Supply Facilities.

24.7 Water Pressures. The Authority shall use its best efforts to supply water under normal operating conditions at the Annual Average Daily Quantity at a pressure not less than 65 psi at the Customer Delivery Point(s) to the Customer unless a different pressure is specified in Exhibit "D". The Authority will not be responsible for interruptions or abnormal operating conditions that cause reduced pressures for interim periods that are beyond the Authority's control.

24.8 Priority of Payment. All monies received by the Authority from the Customers pursuant to this Contract shall be applied in the following order of priority:

FIRST: To the payment of Operating and Maintenance Cost (other than renewal of replacement costs) as provided in the Financing Documents for the Obligations;

SECOND: To the payment of Debt Service Cost as provided in the Financing Documents for the Obligations;

THIRD: To the payment of the renewal and replacement costs;

FOURTH: To the payment of the DeSoto Payment and Charlotte Obligations;

FIFTH: To the payment of any charges or Obligations due and owing by the Authority.

25. **ADDITIONAL REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE CUSTOMERS.** The Customers hereby represent, warrant and covenant to the Authority as follows:

25.1 Irrevocable Commitment to Pay. The Customers recognize that circumstances, such as equipment maintenance or failure, construction delays, failure to obtain Permits, limitations on Permits, transmission line ruptures or defects, acts of God, etc., may prevent the performance by the Authority of its obligations pursuant to this Contract. Under such circumstances, the Customers shall continue to pay their respective Water Rate throughout the term of this Contract. Said payments by the Customers shall be made without notice or demand and without set-off, counterclaim, abatement, suspension or deduction. The Authority is undertaking construction of the REP and additional water supply projects and operation and maintenance of the Authority Water Supply Facilities based in part on the representations, warranties and covenants of the Customers set forth in this Contract.

25.2 Acquisition of Real Property. Subject to Section 22 herein, the Customers shall promptly cooperate with the Authority in acquiring all interests in real property necessary to construct, manage and operate the Authority Water Supply Facilities and Water Supply Sources.

25.3 Utility System Charges. The Customers shall fix, revise, maintain and collect such fees, rates, tariffs, rentals or other charges for the use of products, services and facilities of their water utility systems as shall be necessary to fund the timely payment of their respective

obligations and liabilities under this Contract as well as all other obligations payable from the revenues of their water systems.

25.4 Cooperation on Permits. Subject to Section 22 herein, for the construction and operation of the facilities necessary for the REP and future Authority Water Supply Sources, the Customers shall promptly cooperate with the Authority in obtaining any and all Permits necessary or convenient for construction, expansion, alteration, replacement or operation.

25.5 Cooperation on the REP. The Customers shall promptly cooperate with the Authority in operating or expanding for the REP.

25.6 Utility System Operation and Maintenance Account. Each Customer shall maintain its water utility system operation and maintenance accounts throughout the term of this Contract for the purpose of paying its obligations and liabilities under this Contract. At all times during the term of this Contract, the Customers' obligations and liabilities under this Contract shall be considered an operating expense of its water utility systems and shall be paid from its water utility systems operation and maintenance accounts or capacity fee account or facility investment fees, if appropriate; provided, however, that such obligations and liabilities of a Customer shall not be considered an operating expense of its water utility system nor need it be paid from the operation and maintenance account to the extent the Customer has budgeted and appropriated legally available moneys for such purpose and is current on all its obligations arising hereunder. For the purpose of paying their obligations and liabilities under this Contract, Customers may utilize, in addition to their water utility operation and maintenance accounts, facility investment fees or other capacity fees as identified in their adopted rate resolutions.

25.7 Cooperation on Issuance of Authority Obligations. Each Customer shall cooperate with the

Authority in issuance of the Authority's Obligations. In such connection, each Customer and the Authority shall comply with reasonable requests of each other and will, upon request, do as follows: (i) make available general and financial information about itself; (ii) consent to publication and distribution of its financial information; (iii) certify that its general and financial information is accurate, does not contain any untrue statements of a material fact and does not omit a material fact necessary to make the statements in the information, in light of circumstances under which they are made, not misleading; (iv) make available certified copies of official proceedings; (v) provide reasonable certifications to be used in a transcript of closing documents; and (vi) provide and pay for reasonable requested opinions of counsel as to the validity of its actions taken in respect to and the binding effect of the Second Amended Interlocal Agreement and this Contract, and pending litigation which could materially affect its performance hereunder. Each Customer shall provide the Authority reasonable assurance that no actions taken by it shall adversely affect the exclusion from gross income of interest on the Authority's Obligations for purposes of federal income taxation. Each Customer covenants to assist the Authority in any reasonable manner with respect to the issuance of such Obligations, including but not limited to participation and assistance with any court proceeding seeking to validate the Obligations pursuant to Chapter 75, Florida Statutes.

25.8 Payment for Obligations. If a Customer defaults on the payment of its Water Rate established pursuant to this Contract, each non-defaulting Customer shall have the option to take the defaulting Customer's pro-rata share (based of each Customer's percentage of the total Water Allocation of the Authority) and corresponding payment obligation of the defaulting Customer's Water Allocation within sixty (60) days of notice of the defaulting

Customer's Water Allocation from the Authority. If any of the defaulting Customer's Water Allocation remains after the expiration of sixty (60) days notice period, then each non-defaulting Customer may by mutual agreement with the Authority take any or all of the remaining Water Allocation and corresponding payment obligation created by the default. Any portion of the defaulting Customer's Water Allocation that remains unallocated shall be added to the Redistribution Pool or designated as Authority water capacity; however, these actions shall not relieve the defaulting Customer of its payment obligation to the Authority.

26. **PLEDGE OF CONTRACT REVENUES.** The Authority may pledge any payments, interest or other income or revenues derived under this Contract for the purpose of securing any revenue bonds issued by the Authority to finance the REP and new water supply projects of the Authority Water Supply Facilities.

27. **NORTH PORT'S OPTION TO BECOME A MEMBER.** If the Authority pursuant to the process set forth in the Second Amended Interlocal Agreement, adds a municipality as an Authority Member Government, then North Port at its option may become a member of the Authority upon the same terms and conditions as the new municipality member. North Port must exercise its option within thirty (30) days of the effective date of the amendment to the Second Amended Interlocal Agreement adding the new municipality as a member.

28. **IMPLEMENTATION AGREEMENT.** An Implementation Agreement dated March 8, 1996 was entered into by the Authority and Charlotte that provides, in part, that no further expansion of the Peace River Regional Water Treatment Facility beyond the PRO can be implemented without the Southwest Florida Water Management District setting the Minimum Flow and Levels for the Peace River. Charlotte, without waiving the application of the Implementation Agreement to any further expansion of the Authority Water Supply Facilities beyond the REP, agrees

not to apply the provision of the Implementation Agreement to the development, construction or operation of the REP. However, the Implementation Agreement applies to any further expansion of the Peace River Regional Water Treatment Facility beyond the REP; and it requires that before any further expansion is implemented, Minimum Flows and Levels must be set for the Peace River or the Authority must complete a Section 403.412, Florida Statutes, action including an appeal of an adverse ruling of the lower tribunal, against the District to require it to set Minimum Flows and Levels for the Peace River.

29. **RE-RATING REGIONAL WATER SYSTEM.** To the extent that any component of the Regional Water System is re-rated or treatment capacity is modified with the appropriate regulatory agencies (either an increase or decrease in capacity), then each Customer's corresponding Water Allocation will be adjusted pro-rata on a basis consistent with the Cost Allocation percentage of each Customer. The Authority agrees not to initiate a re-rating process with the intent to reduce System Capacity. For example, a Customer with a Water Allocation of 10% would receive an increase in Water Allocation of 100,000 gallons per day for a 1,000,000 gallon per day re-rating increase. To the extent that the re-rating of the Regional Water System results in the incurrence of additional capital expenditures, the Authority will notify the affected Customers of such expenditures. The expenditures required for and the associated re-rating will be allocated proportionately pursuant to the Water Allocation percentage unless any Customer(s) decide not to participate in the cost and associated benefits of the re-rating. If a Customer does not participate in the re-rating, then the change in Water Allocation and the expenditures will be allocated pro-rata to the participating Customers in accordance with their Water Allocation. All expenditures associated with re-rating will be the responsibility of the participating Customers and are to be paid to the Authority in accordance with the Contract. To the extent any increase in Water Allocation is not

allocated to the Customers, it shall be transferred to the Redistribution Pool.

30. **DEFAULT AND REMEDY.** Recognizing the region's paramount need for a safe and dependable source of water supply, the Parties agree this Contract may not be terminated prior to the normal expiration date specified in Section 2 and the remedy for a breach of the Contract shall be specific performance, injunctive relief and any other equitable relief, as well as monetary damages.

31. **DESIGNATION AS REPRESENTATIVE AND CO-APPLICANT STATUS.** The Authority and the Customers shall be co-applicants for any SWFWMD water use permits needed for the Authority Water Supply Facilities and Authority Water Supply Sources. Subject to Section 22 herein, the Customers shall waive all objections to the Permit applications relating to the acquisition, operation, replacement or expansion of the Authority Water Supply Facilities and Authority Water Supply Sources issued by a federal, state, or regional governmental entity. The Customers hereby designate the Authority as their representative with respect to any such Permit or in any administrative or judicial proceeding relating thereto.

32. **APPLICABLE LAW AND VENUE.** The laws of the State of Florida govern the validity, interpretation, construction and performance of this Contract and venue for any suit involving this Contract shall be in Hillsborough County, Florida.

33. **NO ASSIGNMENT.** The rights, obligations and interests of the Customers and Authority under this Contract may not be wholly or partially sold, assigned, transferred, pledged or hypothecated unless approved in writing by all Parties.

34. **NOTICE.** All notices, demands, requests and other communications shall be deemed sufficient and properly given, if in writing and delivered in person to the following addresses, sent by certified or registered mail, or by overnight delivery, postage prepaid with return receipt requested, at such addresses; provided, if such notices demands, requests or other

communications are sent by mail or overnight delivery, they shall be deemed as given on the third day following such mailing which is not a Saturday, Sunday or a day on which United States mail is not delivered: The Authority's Executive Director's Office, 1645 Barber Road, Suite A, Sarasota, Florida 34240; the Charlotte County Administrator's Office, Charlotte County Administration Center, 18500 Murdock Circle, Port Charlotte, Florida 33948-1094; Manatee County Administrator's Office, Manatee County Administration Center, 1112 Manatee Avenue West, Suite 920, Bradenton, Florida 34205; the DeSoto County Administrator's Office, 201 East Oak Street, Arcadia, Florida 34266; the Sarasota County Administrator's Office, 1660 Ringling Boulevard, Sarasota, Florida 34236; and the North Port City Manager's Office, 5650 North Port Boulevard, North Port, Florida 34287. Any Party may, by like notice, designate any further or different addresses to which subsequent notices shall be sent.

35. **RELATIONSHIP OF THE PARTIES.** Nothing herein shall be deemed to constitute any Party a partner or joint venturer, or to create any fiduciary relationship among the Parties.

36. **THIRD PARTY BENEFICIARIES.** No right or cause of action shall accrue upon or by reason hereof, or for the benefit of any person not expressly named as a Party in this Contract, except for any holders of Obligations and/or credit enhancers relating to Obligations who shall be third party beneficiaries of this Contract.

37. **WAIVER.** Unless otherwise specifically provided by the terms of this Contract, no delay or failure to exercise a right resulting from any breach of this Contract shall impair such right or shall be construed to be a waiver thereof, but such right may be exercised from time to time and as often as may be deemed expedient. Any waiver shall be in writing and signed by the Party granting such waiver. If any representation, warranty or covenant contained in this Contract is breached by

any Party and thereafter waived by another Party, such waiver shall be limited to the particular breach so waived and shall not be deemed to waive, either expressly or impliedly, any other breach under this Contract.

38. **AUTHORIZED REPRESENTATIVES**. For purposes of this Contract, the Parties authorized representatives are as follows: the Authority Executive Director, the Charlotte County Administrator, the DeSoto County Administrator, the Manatee County Administrator, the Sarasota County Administrator, and the City of North Port City Manager. Any Party may change its authorized representative at any time by written notice to all other Parties.

39. **SECTION CAPTIONS AND REFERENCES**. The section headings and captions contained herein are included for convenience only and shall not be considered part of this Contract or affect in any manner its construction or interpretation. Except as otherwise indicated, all references herein to sections are to sections of this Contract.

40. **SEVERABILITY**. In the event any provision of this Contract shall, for any reason, be determined invalid, illegal or unenforceable in any respect, the Parties shall negotiate in good faith and agree to such amendments, modifications or supplements to this Contract or such other appropriate actions as shall, to the maximum extent practicable in the light of such determination, implement and give effect to the intentions of the Parties as reflected herein, and the other provisions of this Contract, as amended, modified, supplemented or otherwise affected by such action, shall remain in full force and effect.

41. **ATTORNEYS FEES AND COST**. In the event there is litigation arising under or related to this Contract, the losing Party or Parties shall pay to the successful Party or Parties all attorney's fees and costs and expenses incurred in enforcing the Contract, including attorneys' fees incurred on appeal, in adversarial administrative proceedings and in connection with bankruptcy

proceedings, to the extent allowed by law. This provision shall survive the termination of this Contract.

42. **AMENDMENT**. This Contract may only be amended by a writing duly executed by the Authority, Manatee, Charlotte, DeSoto, Sarasota and North Port and only to the extent permitted by the Financing Documents authorizing the issuance of the Obligations.

43. **ENTIRE AGREEMENT**. This Contract shall constitute the entire agreement of the Authority, Charlotte, Manatee, DeSoto, Sarasota, and North Port with respect to the Authority's provision of drinking water supply.

44. **FURTHER ASSURANCES**. The Authority, Manatee, Charlotte, DeSoto, Sarasota, and North Port each shall use all reasonable efforts to provide such information, execute such further instruments and documents and take actions as may be reasonably requested by another Party and not inconsistent with the provisions of this Contract and not involving the assumption of obligations or liabilities different from, in excess of or in addition to those expressly provided for in this Contract to carry out the intent of this Contract.

45. **CONSENTS**. To the extent that the consent of any Party to this Contract is required as a condition to the action of other Parties, such consent shall not be unreasonably withheld.

46. **SUCCESSORS AND ASSIGNS**. This Contract shall be binding upon and inure to the benefit of the respective successors, permitted assigns, administrators and trustees of the Authority, Manatee, Charlotte, DeSoto, Sarasota, and North Port.

47. **EXECUTION OF DOCUMENTS**. This Contract shall be executed in fifteen (15) duplicate originals, any of which shall be regarded for all purposes as an original and all of which shall constitute one and the same instrument.

48. **INTERLOCAL AGREEMENT**. This Contract shall constitute an interlocal agreement pursuant to Section 163.01, Florida Statutes. A true and correct copy of this Contract and any subsequent amendments shall be recorded by the Authority with the clerk of the circuit court in Manatee, Charlotte, DeSoto and Sarasota.

49. **AMBIGUITY**. The Parties agree that each one has played an equal part in the negotiation and drafting of this Contract, and in the event any ambiguity should be asserted or realized in the interpretation or construction of this Contract, the result of such ambiguity shall be equally assumed and realized by each Party.

50. **SOVERIGN IMMUNITY**. The Customers intend to avail themselves to the benefits of Sections 768.28 and 163.01(9)(c), Florida Statutes, and of other statutes and common law governing sovereign immunity to the fullest extent possible. In accordance with Section 163.01(5)(o), Florida Statutes, therefore the Customers are not jointly liable for the torts of the officers or employees of the Authority, or any other tort attributable to the Authority, and that only the Authority shall be liable for torts attributable to it or for torts of its officers or employees, and then only to the extent of the waiver of sovereign immunity or limitation of liability specified in Section 768.28, Florida Statutes. The Customers intend the Authority to have all the privileges and immunities from liability and exemptions from laws, ordinances, rules and common law which apply to the municipalities and counties of the State of Florida. Nothing in this Contract is intended to inure to the benefit of any third-party for the purposes of allowing any claim which would otherwise be barred under the Doctrine of Sovereign Immunity or by operation of law.

51. **CONFLICT WITH INTERLOCAL AGREEMENT**. To the extent any provision herein shall conflict with a provision in the Second Amended Interlocal Agreement, the provision in the Second Amended Interlocal Agreement shall be controlling.

52. **GOOD FAITH**. The Parties agree to exercise good faith and fair dealing in respect to all matters relating to this Contract.

53. **WATER PURCHASE**. The Customers shall have a preferential right to purchase water from the Authority. The Authority may purchase water from any source available.

IN WITNESS WHEREOF, the Authority, Manatee, Charlotte, DeSoto, Sarasota, and North Port have executed this Contract on the day, month and year first above written.

PEACE RIVER/MANASOTA REGIONAL
WATER SUPPLY AUTHORITY

WITNESS:

Edward Yates

Linda Stewart

By: Patricia M. Glass

Date: October 5, 2005

PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY SEAL

Approved as to form:

Attorney for Peace River/Manasota
Regional Water Supply Authority

PRMRWSA
OCT - 5 2005
BOARD APPROVED

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Patricia M. Glass, to me known to be the person described in and who executed the foregoing instrument on behalf of the Peace River/Manasota Regional Water Supply Authority, and Patricia M. Glass, acknowledged before me that Patricia M. Glass, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 5th day of October, 2005.

Edward Yates

Notary Public, My
Commission
Expires:

NOTARY PUBLIC STATE OF FLORIDA
Edward Yates
Commission # DD297679
Expires March 17, 2008
Bonded Troy Fain - Insurance, Inc. 800-385-7019

WITNESS:

CHARLOTTE COUNTY
BOARD OF COUNTY COMMISSIONERS

By: Sara J. Devos
Sara J. Devos, Chairman

Date: 9/29/05

Approved as to form:
Janette S. Knowlton
Attorney for Charlotte County MB
Janette S. Knowlton
LR#05-43

ATTEST:
Barbara T. Scott, Clerk of Circuit Court and Ex-Officio Clerk to the Board of County Commissioners

By: Anne L Keller
Deputy Clerk

STATE OF FLORIDA
COUNTY OF CHARLOTTE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Sara J. Devos, to me known to be the person described in and who executed the foregoing instrument on behalf of the Charlotte County, and _____, acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 29th day of September, 2005.

Stacey K. Miller
Notary Public, My Commission Expires:

NOTARY PUBLIC-STATE OF FLORIDA
Stacey K. Miller
Commission # DD448505
Expires: JULY 07, 2009
Bonded Thru Atlantic Bonding Co., Inc.

FL#2005012976 B 570 P1050
REC NO. 07528506341

DESOTO COUNTY

WITNESS:

Craig M. Cottey

Donna J Hoth

By: Ronald P Meads

Date: September 13, 2005

Approved as to form:

Attorney for DeSoto County

STATE OF FLORIDA
COUNTY OF DESOTO

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, RONALD P. NEADS, to me known to be the person described in and who executed the foregoing instrument on behalf of the DeSoto County, and RONALD P. NEADS, acknowledged before me that RONALD P. NEADS, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 14th day of September, 2005.

Carol Treadwell

Notary Public, My Commission Expires:

CAROL TREADWELL
Notary Public, State of Florida
My comm. expires March 15, 2006
Comm. No. DD098119

MANATEE COUNTY

WITNESS:

_____ By: _____

_____ Date: 9/20/05

BOARD OF COUNTY COMMISSIONERS SEAL MANATEE CO. FLA.

Approved as to form:
Not applicable
Attorney for Manatee County

ATTEST: R. B. SHORE
Clerk of the Circuit Court

By: _____

STATE OF FLORIDA
COUNTY OF MANATEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, _____, to me known to be the person described in and who executed the foregoing instrument on behalf of the Manatee County, and _____, acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this ____ day of _____, 2005.

_____
Notary Public, My
Commission
Expires:

SARASOTA COUNTY

WITNESS:

Kathleen F Schneider

Tricia Granger

By: Paul H Mercier

Date: SEPT 29, 2005

Approved as to form:

Attorney for Sarasota County

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, PAUL H MERCIER, to me known to be the person described in and who executed the foregoing instrument on behalf of the Sarasota County, and _____, acknowledged before me that HE, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 29th day of SEPTEMBER, 2005.

Jean W Owens

Notary Public, My Commission Expires:

Jean W Owens
My Commission DD220275
Expires June 05, 2007

FL#2005012976 B 570 P1053
REC NO. 07528506341

WITNESS:

[signature]

Cynthia Mick

Approved as to form: Robert K. Rol

Attorney for City of North Port

CITY OF NORTH PORT

Richard A. Lockhart, Commission Chair

By: [signature]

Date: October 4, 2005

ATTEST: [signature]

Helen M. Raimbeau, CMC

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Commissioner Richard A. Lockhart, to me known to be the person described in and who executed the foregoing instrument on behalf of the City of North Port, and Commissioner Richard A. Lockhart acknowledged before me that Commissioner Richard A. Lockhart executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 4th day of October, 2005.

Patsy C. Adkins

Notary Public, My Commission Expires: October 15, 2007

Patsy C. Adkins
Commission # DD258739
Expires October 15, 2007
Bonded Troy Fain - Insurance, Inc. 800-385-7019

PR Contract Exhibits

A	DESOTO PAYMENT
B	WATER ALLOCATION
C	NEW WATER SUPPLY DEMANDS
D	REGIONAL TRANSMISSION SYSTEM DELIVERY POINTS
E	REGIONAL TRANSMISSION SYSTEM HYDRAULIC CAPACITY ENTITLEMENT
F	COST ALLOCATION PERCENTAGES
G	REGIONAL EXPANSION PROGRAM
H	WATER ALLOCATION BY PROJECT
I	DESOTO EXISTING WATER SOURCES TO REMAIN AFTER DESIGNATION OF THE AUTHORITY AS EXCLUSIVE PROVIDER
J	PEACE RIVER REGIONAL WATER TREATMENT FACILITY – ANNUAL CAPITAL COMPONENT CHARGE REDEMPTION PROVISION

EXHIBIT "A"

DeSoto Payment Schedule

DeSoto Payment (Annual Assessment)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	$368,564	$15,889	$101,111	$34,436	$520,000
FY06	$368,564	$15,889	$101,111	$34,436	$520,000
FY07	$368,564	$15,889	$101,111	$34,436	$520,000
FY08	$368,564	$15,889	$101,111	$34,436	$520,000
FY09	$361,403	$15,424	$177,073	$44,346	$598,247
FY10	$363,140	$15,341	$244,396	$53,586	$676,463
FY11	$369,266	$15,482	$303,326	$61,927	$750,000
FY12	$369,266	$15,482	$303,326	$61,927	$750,000
FY13	$369,266	$15,482	$303,326	$61,927	$750,000
FY14	$369,266	$15,482	$303,326	$61,927	$750,000
Remaining Years	$369,266	$15,482	$303,326	$61,927	$750,000

EXHIBIT "B"

Water Allocation

Annual Average Daily (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	12.525	0.535	3.048	1.192	17.300
FY06	12.758	0.550	3.500	1.192	18.000
FY07	12.758	0.550	3.500	1.192	18.000
FY08	12.758	0.550	3.500	1.192	18.000
FY09	13.895	0.593	6.808	1.705	23.001
FY10	15.031	0.635	10.116	2.218	28.000
FY11	16.100	0.675	13.225	2.700	32.700
FY12	16.100	0.675	13.225	2.700	32.700
FY13	16.100	0.675	13.225	2.700	32.700
FY14	16.100	0.675	13.225	2.700	32.700
Remaining Years	16.100	0.675	13.225	2.700	32.700

Peak Monthly Average Day (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	15.030	0.642	3.658	3.146	22.476
FY06	15.310	0.660	4.200	3.146	23.316
FY07	15.310	0.660	4.200	3.146	23.316
FY08	15.310	0.660	4.200	3.146	23.316
FY09	16.187	0.690	7.931	3.146	27.954
FY10	17.512	0.740	11.785	3.146	33.183
FY11	18.757	0.786	15.407	3.146	38.096
FY12	18.757	0.786	15.407	3.146	38.096
FY13	18.757	0.786	15.407	3.146	38.096
FY14	18.757	0.786	15.407	3.146	38.096
Remaining Years	18.757	0.786	15.407	3.146	38.096

Maximum Day (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	17.535	0.749	4.267	3.780	26.331
FY06	17.861	0.770	4.900	3.780	27.311
FY07	17.861	0.770	4.900	3.780	27.311
FY08	17.861	0.770	4.900	3.780	27.311
FY09	19.453	0.830	9.531	3.780	33.594
FY10	21.043	0.889	14.162	3.780	39.874
FY11	22.540	0.945	18.515	3.780	45.780
FY12	22.540	0.945	18.515	3.780	45.780
FY13	22.540	0.945	18.515	3.780	45.780
FY14	22.540	0.945	18.515	3.780	45.780
Remaining Years	22.540	0.945	18.515	3.780	45.780

Annual Average Day, Peak Monthly Average Day, Maximum Day are expressed in million gallons per day (MGD).

EXHIBIT "C"
New Water Supply Demands

Annual Average Day (MGD)					
Fiscal Year	Charlotte Co.	DeSoto Co.	Sarasota Co.	North Port	Total
FY05	0.000	0.000	0.000	0.000	0.000
FY06	0.000	0.153	0.000	0.808	0.961
FY07	0.000	0.578	0.000	1.558	2.136
FY08	0.000	1.200	0.000	2.308	3.508
FY09	0.000	2.080	0.000	2.065	4.145
FY10	0.000	3.114	0.000	2.082	5.196
FY11	1.658	3.429	0.000	2.200	7.287
FY12	1.658	3.785	0.000	2.700	8.143
FY13	1.658	4.140	3.000	3.200	11.998

Peak Monthly Average Day (MGD)					
Fiscal Year	Charlotte Co.	DeSoto Co.	Sarasota Co.	North Port	Total
FY05	0.000	0.000	0.000	0.000	0.000
FY06	0.000	0.184	0.000	1.547	1.731
FY07	0.000	0.694	0.000	2.731	3.425
FY08	0.000	1.440	0.000	3.714	5.154
FY09	0.000	2.496	0.000	4.740	7.236
FY10	0.000	3.737	0.000	5.255	8.992
FY11	0.000	4.115	0.000	5.825	9.940
FY12	1.990	4.542	0.000	6.229	12.761
FY13	1.990	4.968	3.600	6.599	17.157

Maximum Day (MGD)					
Fiscal Year	Charlotte Co.	DeSoto Co.	Sarasota Co.	North Port	Total
FY05	0.000	0.000	0.000	0.000	0.000
FY06	0.000	0.214	0.000	2.460	2.674
FY07	0.000	0.809	0.000	4.010	4.819
FY08	0.000	1.680	0.000	5.285	6.965
FY09	0.000	2.912	0.000	6.606	9.518
FY10	0.000	4.360	0.000	7.245	11.605
FY11	0.000	4.801	0.000	7.950	12.751
FY12	2.321	5.299	0.000	8.430	16.050
FY13	2.321	5.796	4.200	8.860	21.177

Annual Average Day, Peak Month Average Day, Peak Day are expressed in million gallons per day (MGD)

EXHIBIT "D"

Regional Transmission System
Delivery Points

	Delivery Points	Pressure (5)
36-Inch/12-Inch RTS (1)	Charlotte County: • Harbor Boulevard @ Bachman • Kings Highway @ DeSoto/Charlotte County Line DeSoto County: • Pem Brook Pines • Kings Highway @ Lake Suzy Utilities City of North Port: • Raintree @ Serris Drive	65 psi
42-Inch RTS (2)	Sarasota County: • T. Mabry Carlton: Jr. WTP	20 psi
24-Inch Kings Highway RTS (3)	Charlotte County: • Kings Highway @ Kingsway Circle DeSoto County: • Kings Highway @ Riverside RV Park • Kings Highway @ Peace River Street* • Kings Highway @ adjacent to Lake Suzy*	65 psi
20-Inch DeSoto Regional Pipeline (4)	DeSoto County: • 8 delivery points along the transmission line as identified in the contract*	65 psi

(1) The 36-Inch/12-Inch RTS consists of approximately 7 miles of 36-inch pipeline starting at the Peace River Water Treatment Facility and ending south of the Charlotte/Sarasota County border; and 12-inch pipeline extending from the 36-inch pipeline at the DeSoto/Sarasota County border south to Kings Highway and ending at the DeSoto/Charlotte County line.

(2) The 42-inch RTS consists of approximately 23 miles of 42-inch pipeline starting at the Peace River Water Treatment Facility and ending at the T. Mabry Carlton Jr. Water Treatment Plant in Sarasota County.

(3) The 24-inch Kings Highway RTS consists of approximately 5 miles of 24-inch pipeline starting at the Peace River Water Treatment Facility and paralleling Kings Highway ending at the DeSoto/Charlotte County line. See contract entitled: Kings Highway

Segment Regional Transmission System Pipeline Agreement between The Peace River/Manasota Regional Water Supply Authority and Charlotte County dated October 27, 1998.

(4) The 20-Inch DeSoto Regional Pipeline. See contract entitled: DeSoto County Regional Pipeline Extension Amended Pipeline Agreement dated June 21, 2004.

(5) Water pressure at delivery points at a quantity no greater than the average annual daily rate as designated on Exhibit "B" or as specifically designated by the Authority for a delivery point.

* Future Delivery Points already in planning, design or construction.

EXHIBIT "E"

Regional Transmission System
Hydraulic Capacity Entitlement

	Charlotte County	DeSoto County	Sarasota County	City of North Port
36-Inch/12-Inch RTS (1)	89.65%	0.42%	0.000	9.93%
42-Inch RTS (2)	0.000	0.000	100%	0.000
24-Inch Kings Highway RTS (3)	80%	20%	0.000	0.000
20-Inch DeSoto(4)	0.000	3.1 MGD	0.000	0.000

(1) The 36-Inch 12-Inch RTS consists of approximately 7 miles of 36-inch pipeline starting at the Peace River Water Treatment Facility and ending south of the Charlotte/Sarasota County border; and 12-inch pipeline extending from the 36-inch pipeline at the DeSoto/Sarasota County border south to Kings Highway and ending at the DeSoto/Charlotte County line.

(2) The 42-inch RTS consists of approximately 23 miles of 42-inch pipeline starting at the Peace River Water Treatment Facility and ending at the T. Mabry Carlton Jr. Water Treatment Plant in Sarasota County.

(3) The 24-inch Kings Highway RTS consists of approximately 5 miles of 24-inch pipeline starting at the Peace River Water Treatment Facility and paralleling Kings Highway ending at the DeSoto/Charlotte County line. See contract entitled: Kings Highway Segment Regional Transmission System Pipeline Agreement between The Peace River/Manasota Regional Water Supply Authority and Charlotte County dated October 27, 1998.

(4) The 20-Inch DeSoto Regional Pipeline. See contract entitled: DeSoto County Regional Pipeline Extension Amended Pipeline Agreement dated June 21, 2004.

Current pipelines are more than adequate to transport Charlotte's 16.1 MGD to its water system.

EXHIBIT "F"

COST ALLOCATION PERCENTAGES

	Charlotte	DeSoto	Sarasota	North Port
Peace River Regional Water Treatment Facility (1991 Facility) Cost Allocation	89.65%	0.42%	0.00%	9.93%
PRO Cost Allocation	33.33%	8.33%	58.34%	0.00%
REP Cost Allocation*	27.21%	0.81%	61.72%	10.26%

* The REP cost allocation percentages were applied to the total oversized facilities payment to Charlotte for the REP; however, Charlotte paid in advance for its portion so that payment by the remaining participating Customers is made pursuant to the cost allocation percentages in Section 18.2, as follows: Sarasota paying 85.62%, North Port paying 13.28% and DeSoto paying 1.1%.

EXHIBIT "G"

Regional Expansion Program
Proposed Project Plan

Authority Water Supply Facilities Overview

The Authority Water Supply Facilities, located in DeSoto County, provide public drinking water to residents of Charlotte, DeSoto and Sarasota counties. The facilities allow for the use of surface water to alleviate further stress on groundwater supplies and resultant degradation in the Southern Water Use Caution Area ("SWUCA").

The Regional Expansion Program ("REP") is to build out the Authority Water Supply Facilities to its existing water use permit ("WUP") capacity and intended to meet water demand in the Authority's system service area, as detailed in Figure A, attached. The issuance of the WUP in 1996 provides for expansion of the Authority Water Supply Facilities to meet an anticipated demand of 32.7 million gallons per day ("MGD") by the year 2016. The permit includes future water quantities to meet the needs of Charlotte, DeSoto and Sarasota counties and the City of North Port.

The Authority Water Supply Facilities have a current delivery capacity to supply 18 MGD of water and is located next to the Peace River in southwest DeSoto County. The Authority Water Supply Facilities utilizes the Peace River as a primary source and integrates the use of an off-stream reservoir for raw water storage and aquifer storage and recovery (ASR) wellfield for treated water storage. The reservoir and ASR wellfield are used for source supply when river flow is below minimum limits for withdrawal or when river water quality is poor.

PROJECT Description

The existing water treatment plant capacity is 24 MGD to provide for ASR recharge capacity. The treatment process provides for color removal of surface water including alum coagulation, filtration and disinfection. Build out of the facility to meet projected water demands projected within the WUP of 32.7 MGD by 2016 is proposed by the Authority's Regional Expansion Program. The Southwest Florida Water Management District ("SWFWMD") issued a WUP to the Authority in 1996 that allows for withdrawal from the Peace River to meet a demand of 32.7 MGD. The term of the permit is for 20 years through 2016.

The source of raw water for the Authority Water Supply Facilities is the Peace River. Under the SWFWMD's WUP issued to the AUTHORITY, the AUTHORITY can divert up to 10 percent of the Peace River flow to the Authority Water Supply Facilities when flow exceeds 130 cubic feet per second (cfs). During periods of high flows from the Peace River, raw water is stored in an off-stream reservoir and any water after treatment in excess of customers' demand is stored in the ASR wellfield which consists of 21 ASR wells. When the conditions of the Peace River are such that the ability to withdraw from the river is partially or completely eliminated, the off-stream reservoir and ASR wellfield are utilized to meet the water supply demands of the Authority's customers.

The Authority's Regional Expansion Program will provide expanded facilities to provide the ability to deliver the total allocation of 32.7 MGD to the Authority's customers. The PROJECT includes expanding the raw water reservoir capacity with a second new off-stream reservoir with a capacity of 6 billion gallons, increasing the water treatment plant capacity by 24 MGD and extension of the regional transmission system to serve areas of DeSoto County.

Regional Reservoir Expansion

The existing off-stream reservoir capacity is approximately 0.6 billion gallons for the purpose of storing raw water withdrawn from the Peace River. The reservoir is used for raw water supply to the Authority Water Supply Facilities when river flow is below minimum limits for withdrawal or when river water quality is poor. The proposed Regional Reservoir Expansion is to provide approximately 6 billion gallons of additional storage, resulting in a total reservoir storage capacity of approximately 6.6 billion gallons. This storage volume is required to provide a sustainable supply to meet the Authority's customers' demand during dry periods when withdrawal from the Peace River is limited in order to maintain minimum flow to the downstream estuary and Charlotte Harbor.

The new reservoir will be an above-ground basin formed by an engineered earthen embankment approximately 30 feet above existing ground surface. The embankment will consist of compacted fill with a geosynthetic membrane and an impervious, water retaining zone within the embankment. A soil-bentonite slurry wall will be installed extending from the geosynthetic membrane zone to the underlying clay layer to cut off underseepage beneath the embankment. In addition, an internal chimney drain will be installed to intercept potential seepage through the embankment. A perimeter seepage collection ditch will be constructed at the downstream toe of the embankment to collect and convey seepage. Access to the reservoir will be limited for security reasons.

Mitigation for the reservoir impacts is planned through restoration of the RV Griffin Reserve. This reservoir is the largest surface area that can reasonably be built on the site without the need for off-site mitigation of on-site wetland impacts

New piping to pump up to 90 MGD of raw water from the river to the reservoir and piping to transfer water from the new reservoir to the exiting reservoir is also included in the project. The PROJECT includes design, permitting and construction of the reservoir expansion, including raw water piping improvement to improve the ability to divert raw water from the Peace River to the Reservoir.

The reservoir expansion will be located on AUTHORITY property and the RV Griffin Reserve owned by the SWFWMD. The land use plan presented in "A Plan for the Use and Management of the RV Griffin Reserve" (SWFWMD, November 1996) provides a conceptual siting of a reservoir expansion.

Peace River Water Treatment Plant Treatment Capacity Expansion

The current water treatment plant treatment capacity is 24 MGD. The proposed expansion is anticipated to provide an additional 24 MGD of treatment capacity and result in a total capacity of 48 MGD. The facility expansion is to include raw water pumping (river and reservoir), powder

activated carbon (PAC) contact basins, rapid mix, flocculation and sedimentation basins, filters, chlorine contact basins, chemical feed systems, above ground storage tanks, high service pumping, backwash recovery basins, residual thickening and mechanical dewatering system, instrumentation and controls. The additional treatment components will be incorporated into the existing treatment scheme and supervisory control and data acquisition (SCADA) system. The expansion also includes the construction of an operations center.

Improvements to the river raw water pump station will include the addition of new river pumps to increase the installed diversion pumping capacity to 90 MGD, consistent with the maximum day withdrawal allowed by the Authority's WUP, and construction of a second 48-inch raw water pipeline from the river pumping station to the reservoir site.

New pumps will be added to the existing reservoir pumping station to increase the reservoir pumping capacity to a firm capacity of 54 MGD of raw water from the reservoir to the treatment plant. A new 30-inch pipeline from the reservoir pump station to the treatment plant is also planned to accommodate the increased capacity of the reservoir pumping station.

DeSoto County Regional Transmission System Extension

The DeSoto County Regional Transmission System (RTS) extension will provide transmission of potable water from the Authority Water Supply Facilities to extended areas of DeSoto County. The RTS extension consists of approximately 5 miles of 20-inch diameter pipeline from the Peace River Facility to an end point at U.S. 17 and Enterprise Drive where it connects to the DeSoto County utility system. The pipeline route is adjacent to County Road 761 and U.S. 17 and is entirely within DeSoto County.

The RTS is sized beyond DeSoto's need to provide the capacity for potential future expansion of the Authority Water Supply Facilities to locations beyond DeSoto County and future interconnection with other neighboring utilities within DeSoto and Charlotte counties. Further interconnection of utility systems would enhance regional supply management and provide the opportunity to rotate and rest sources of supply.

Schedule

The anticipated schedule is provided in Table 1.

Table 1
Authority Water Supply Facilities Expansion
Project Schedule

	Regional Reservoir Expansion	Water Treatment Plant Expansion	DeSoto County RTS Extension
Consultant Selection	Completed	Completed	Completed
Expansion Analysis	Completed	Completed	Completed
'Water Quality Master Plan Update'	N/A	Completed	N/A
'Basis of Design Report'	September 2005	September 2005	Completed
Permitting	September 2006	September 2006	Completed
Detailed Plans and Specifications	September 2006	September 2006	Completed
Bidding	November 2006	November 2006	Completed
Award Construction Contract	December 2006	December 2006	Completed
Project Substantial Completion*	October 2008	October 2008	September 2005
Final Completion of Construction	March 2009	March 2009	September 2005

*Project Substantial Completion is the beneficial use of the facilities to produce and deliver water.

Costs

The summary of probable costs (2005 dollars) is provided in Table 2.

Table 2
Authority Water Supply Facilities Expansion
Summary of Probable Costs

Activity	Total Project Cost
Regional Reservoir Expansion	$49,000,000
Water Treatment Plant Expansion	$70,768,000
DeSoto County RTS Extension	$3,632,000
TOTAL REP COST	$123,400,000

The probable costs shown are hard costs for engineering services and construction. The costs do not include Authority administrative costs or cost of bond issuance.

EXHIBIT "H"

Water Allocation by Project

	Charlotte	DeSoto	Sarasota	North Port
Peace River Regional Water Supply Facility (1991 Facility)	10.758	0.050	0.000	1.192
PRO Water Allocation	2.000	0.500	3.500	0.000
REP Water Allocation	3.342	0.125	9.725	1.508

EXHIBIT "I"

DeSoto Existing Water Sources to Remain After Designation of the Authority as Exclusive Provider

1) Sources associated with that certain Interlocal Bulk Water and Wastewater Supply Agreement Between the City of Arcadia and DeSoto County dated January 30, 2001.

2) The Reverse Osmosis Facility at DeSoto Correctional Institute.

3) The Reverse Osmosis Facility at the G. Perce Wood Memorial Hospital Facility.

EXHIBIT "J"

Peace River Regional Water Treatment Facility – Annual Capital Component Charge Redemption Provision

Annual Capital Component Charge After REP Oversized Capacity Payment made to Charlotte County of $3,287,098.00	$1,971,557.00
Monthly Capital Component Charge payable To Charlotte County beginning January 1, 2006 Through and including October 1, 2021	$ 164,296.42
Level Debt Service Factor based on Allocable Amount of Bond Issue related to Peace River Facility	7.491893%
Redemption value of Capital Component Charge Assuming a Series 2005 bond closing of December 14, 2005 and a Level Debt Service Factor of 7.491893% (Illustrative purposed only)	$18,299,274.17

Redemption of Annual Capital Component Charge

Upon mutual agreement between the Authority and Charlotte, the remaining Annual Capital Component Charges of $1,971,557.00 can be redeemed on any date at the following redemption price:

The sum of the present values of the remaining scheduled Annual Capital Component Charges on a monthly basis ($164,296.42) discounted to the date of redemption on a monthly basis (assuming a 360 day year consisting of twelve 30-day months) at the Capital Component Charge for Peace River Regional Water Treatment Facility – level debt service factor based on allocable amount of 7.491893%.

9

2 Indexes

Peace River Manasota
8311 Atrium Dr. Suite 100
Bradenton, FL 34202

FIRST AMENDMENT TO PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY MASTER WATER SUPPLY CONTRACT

THIS FIRST AMENDMENT TO PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY MASTER WATER SUPPLY CONTRACT (this "Amendment") is made and entered into as of the 4th day of JUNE, 2008, by and between the **PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY**, a regional water supply authority created and existing pursuant to Sections 373.196, 373.1962 and 163.01, Florida Statutes, and other applicable law, acting by and through its Board of Directors, the governing board thereof ("Authority"); **MANATEE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Manatee"); **CHARLOTTE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Charlotte"); **DeSOTO COUNTY**, a political subdivision of the State of Florida, acting through its Board of County Commissioners, the governing board thereof ("DeSoto"); **SARASOTA COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, the governing board thereof ("Sarasota"); and the **CITY OF NORTH PORT**, a municipal corporation of the State of Florida, acting by and through its Board of City Commissioners, the governing board thereof ("North Port") (collectively "Customers").

WITNESSETH:

WHEREAS, the Authority and Customers entered into the Peace River/Manasota Regional Water Supply Authority Master Water Supply Contract effective October 5, 2005 (the "Agreement"); and

WHEREAS, pursuant to the Agreement, each Customer submitted to the Authority a report which identified its projections for Authority Supplied Water, each Customer identified that quantity of water it shall purchase from the Authority in the designated Contract Year. For the initial time period through Contract Year 2013, the New Water Supply Demands in Exhibit "C" was the water each Customer irrevocably committed to purchase from the Authority, and the Authority agreed to supply such water; and

WHEREAS, at the time Customers submitted their New Water Supply Demands to the Authority in 2005, Customers were experiencing rapid population growth and intense development; and

WHEREAS, the Customers have since submitted their New Water Supply Demands to the Authority in 2008, the rapid population growth and intense development previously experienced by the Customers has declined; and

WHEREAS, the Agreement may only be amended by a writing duly executed by the Authority, Manatee, Charlotte, DeSoto, Sarasota and North Port and pursuant to the terms and conditions of the Agreement.

NOW, THEREFORE, in consideration of the foregoing recitals, Authority and the Customers hereby agree as follows:

1. **Incorporation of Recitals**. The foregoing recitals are true and correct and are incorporated herein by reference.

2. **Amendments**.

2.1 Exhibit "C" of the Agreement, entitled "New Water Supply Demands" is hereby deleted in its entirety and replaced with the amended Exhibit "C" attached to this amendment.

3. **Ratification**. The terms and conditions of the Agreement, as amended by this Amendment, are hereby ratified and confirmed by the parties.

IN WITNESS WHEREOF, the Authority, Manatee, Charlotte, DeSoto, Sarasota, and North Port have caused this Amendment to be executed effective as of the date first above written.

IN WITNESS WHEREOF, have executed this Contract on the day, month and year first above written.

PEACE RIVER MANASOTA REGIONAL
WATER SUPPLY AUTHORITY

WITNESS:

By: _____
Shannon Staub, Chairman

PRMRWSA BOARD APPROVED JUN 4 2008

Date: 6-4-08

Approved as to form:

Attorney for Peace River Manasota Regional
Water Supply Authority

PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY SEAL

STATE OF FLORIDA
COUNTY OF MANATEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Shannon Staub, to me known to be the person described in and who executed the foregoing instrument on behalf of the Peace River Manasota Regional Water Supply Authority and Shannon Staub, acknowledged before me that Shannon Staub, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 4th day of June, 2008

Notary Public, My
Commission
Expires:

EDWARD YATES
Commission DD 760115
Expires March 17, 2012
Bonded Thru Troy Fain Insurance 800-385-7019

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY

By _____
Thomas C. D'Aprile, Chairman

Date: _____

ATTEST:
Barbara T. Scott, Clerk of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By: Anne L. Keller
5-13-08 Deputy Clerk CHGR 2005-048

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

Janette S. Knowlton, County Attorney MB
LR 08-43

STATE OF FLORIDA
COUNTY OF CHARLOTTE

I HEREBY CERTIFY that on this day, before, me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Tom D'Aprile, to me known to be the person described in and who executed the foregoing instrument on behalf of Charlotte County, and _____ acknowledged before me that TOM D'APRICE, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 14th day of May, 2008.

Bonnie S. Stoner
Notary Public
My Commission Expires:

NOTARY PUBLIC-STATE OF FLORIDA
Bonnie S. Stoner
Commission # DD447969
Expires: JULY 06, 2009
Bonded Thru Atlantic Bonding Co., Inc.

Peace River/Manasota
Regional Water Supply Authority

MAY 27 2008

DESOTO COUNTY
BOARD OF COUNTY COMMISSIONERS

WITNESS:

By: T. Felton Garner

Carol Treadwell

Date: May 16, 2008

Approved as to form:

Howard C. Hollyday
Attorney for DeSoto County

STATE OF FLORIDA
COUNTY OF FLORIDA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, T. Felton Garner, to me known to be the person described in and who executed the foregoing instrument on behalf of DeSoto County, and he acknowledged before me that he, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 16th day of May, 2008.

Notary Public, My
Commission
Expires:

BETTY PHILLIPS
Notary Public, State of Florida
My comm. expires Dec. 18, 2011
Comm. No. DD741978

MANATEE COUNTY
BOARD OF COUNTY COMMISSIONERS

WITNESS:

_____ By: _____

_____ Date: 4/22/08

Approved as to form:

_____
Attorney for Manatee County

ATTEST: R. B. SHORE
CLERK OF CIRCUIT COURT
BY: _____
DEPUTY CLERK

BOARD OF COUNTY COMMISSIONERS SEAL MANATEE CO. FLA.

STATE OF FLORIDA
COUNTY OF MANATEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, _____, to me known to be the person described in and who executed the foregoing instrument on behalf of Manatee County, and _____ acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this _____ day of _____, 2008

_____
Notary Public, My
Commission
Expires:

SARASOTA COUNTY
BOARD OF COUNTY COMMISSIONERS

WITNESS:

Deborah Shaffer

Paula J. Clintoman

By: Shannon Staub

Date: 5/28/2008

Approved as to form:

Attorney for Sarasota County

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Shannon Staub, to me known to be the person described in and who executed the foregoing instrument on behalf of Sarasota County, and _____ acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 28th day of May, 2008

Roberta Ilene Benson

Notary Public, My Commission Expires:

ROBERTA ILENE BENSON
MY COMMISSION # DD 706512
EXPIRES: August 20, 2011
Bonded Thru Notary Public Underwriters

CITY OF NORTH PORT

WITNESS:

Ida Strong

Susan Hale

By: _____

Date: April 28, 2008

Approved as to form:

Robert K. Robinson

Attorney for City of North Port

ATTEST:

Helen M. Raimbeau, CMC
City Clerk

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, FRED E. TOWER, III, to me known to be the person described in and who executed the foregoing instrument on behalf of the City of North Port, and _____ acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 5th day of May, 2008

BETH E. LEGARE
MY COMMISSION # DD743658
EXPIRES: December 23, 2011
1-800-3-NOTARY Fl. Notary Discount Assoc. Co.

Beth E. Legare

Notary Public, My Commission Expires:

EXHIBIT "C"
New Water Supply Demands

Annual Average Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY08	0.000	0.000	0.000	0.000	0.250	0.250
FY09	0.000	0.000	0.000	0.000	0.250	0.250
FY10	0.000	0.032	0.000	0.000	0.250	0.282
FY11	0.000	0.123	0.000	0.000	0.250	0.373
FY12	0.000	0.279	0.000	0.000	0.250	0.529
FY13	0.000	0.409	0.000	0.000	0.400	0.809
FY14	1.658	0.539	0.000	0.000	0.500	2.697
FY15	1.658	0.763	0.000	0.000	0.500	2.921

Peak Month Average Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY08	0.000	0.000	0.000	0.000	0.400	0.400
FY09	0.000	0.000	0.000	0.000	0.400	0.400
FY10	0.000	0.038	0.000	0.000	0.400	0.438
FY11	0.000	0.148	0.000	0.000	0.400	0.548
FY12	0.000	0.335	0.000	0.000	0.400	0.735
FY13	0.000	0.491	0.000	0.000	0.600	1.091
FY14	1.990	0.647	0.000	0.000	1.000	3.637
FY15	1.990	0.916	0.000	0.000	1.000	3.906

Maximum Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY08	0.000	0.000	0.000	0.000	0.500	0.500
FY09	0.000	0.000	0.000	0.000	0.500	0.500
FY10	0.000	0.045	0.000	0.000	0.500	0.545
FY11	0.000	0.172	0.000	0.000	0.500	0.672
FY12	0.000	0.391	0.000	0.000	0.500	0.891
FY13	0.000	0.573	0.000	0.000	1.000	1.573
FY14	2.321	0.755	0.000	0.000	1.500	4.576
FY15	2.321	1.068	0.000	0.000	1.500	4.889

Annual Average Day, Peak Month Average Day and Maximum Day are expressed in million gallons per day (MGD).

Linda Stewart
9415 Town Center Pkwy
Lakewood Ranch, FL 34202

MAD

Inst:201514004166 Date:8/5/2015 Time:10:56 AM
DC,Mitzie McGavic,Desoto County Page 1 of 13

SECOND AMENDMENT TO PEACE RIVER/MANASOTA REGIONALWATER SUPPLY AUTHORITY MASTER WATER SUPPLY CONTRACT

THIS SECOND AMENDMENT TO PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY MASTER WATER SUPPLY CONTRACT ("Second Amendment") is made and entered into as of the 5th day of AUGUST, 2015, by and between the **PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY**, a regional water supply authority created and existing pursuant to Sections 373.713 and 163.01, Florida Statutes, and other applicable law, acting by and through its governing board ("Authority"); **MANATEE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners ("Manatee"); **CHARLOTTE COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, ("Charlotte"); **DESOTO COUNTY**, a political subdivision of the State of Florida, acting through its Board of County Commissioners, ("DeSoto"); **SARASOTA COUNTY**, a political subdivision of the State of Florida, acting by and through its Board of County Commissioners, ("Sarasota"); and the **CITY OF NORTH PORT**, a municipal corporation of the State of Florida, acting by and through its Board of City Commissioners, ("North Port") (collectively "Customers").

WITNESSETH:

WHEREAS, the Authority and Customers entered into the Peace River/Manasota Regional Water Supply Authority Master Water Supply Contract effective October 5, 2005 ("MWSC") and entered into a First Amendment to Peace River/Manasota Regional Water Supply Authority Master Water Supply Contract on June 4th, 2008; and

WHEREAS, the Authority and Charlotte County entered into an Interlocal Agreement Resolving 1991 Rebuild Project Dispute ("Settlement") on November 25, 2014. This Settlement, in part, provides for Charlotte County and the Authority to cooperate to modify certain provisions of the MWSC including changing the definition of the term "Renewal and Replacement Costs" and modifying potions of Exhibit B entitled Water Allocation for Sarasota and City of North Port; and,

RECORDED IN OFFICIAL RECORDS
INSTRUMENT # 2015098517 13 PG(S)
August 07, 2015 10:51:46 AM
KAREN E. RUSHING
CLERK OF THE CIRCUIT COURT
SARASOTA COUNTY, FL

CHARLOTTE COUNTY CLERK OF CIRCUIT COURT
OR BOOK: 3999 PAGE 612 PAGE: 1 OF 13
INSTR # 2372563 Doc Type: AGR
Recorded: 8/5/2015 at 12:05 PM
Rec. Fee: RECORDING $112.00
Cashier By: MICHELED

WHEREAS, pursuant to the MWSC, each Customer submitted to the Authority a report which identified its projections for Authority Supplied Water and the quantity of water it shall purchase from the Authority in the designated Contract Year. The New Water Supply Demands in Exhibit "C" of the MWSC provides for the quantity of water each Customer is irrevocably committed to purchase from the Authority, and the Authority agrees to supply such water; and

WHEREAS, the Customers have sought to modify the MWSC to remove all request for additional water from Exhibit "C" of the MWSC; and

WHEREAS, the MWSC may only be amended by in writing duly executed by the Authority, Manatee, Charlotte, DeSoto, Sarasota and North Port and pursuant to the terms and conditions of the MWSC.

NOW, THEREFORE, in consideration of the foregoing recitals, Authority and the Customers agree as follows:

1. **Incorporation of Rights**. The foregoing recitals are true and correct and are incorporated herein by reference.

2. **Amendments**.

2.1 Exhibit "B" of the MWSC, entitled Water Allocation is deleted in its entirety and replaced with the Exhibit "B" table attached to this Second Amendment.

2.2 Exhibit "C" of the MWSC, entitled "New Water Supply Demands" and previously modified by the First Amendment to Peace River/Manasota Regional Water Supply Authority Master Water Supply Contract dated June 4th, 2008, is deleted in its entirety and replaced with the Exhibit "C" table attached to this Second Amendment.

2.3 The definition of Renewal and Replacement Costs at provision 1.36 of the MWSC is deleted in its entirety and replaced with the following: "1.36 Renewal and Replacement Costs. The capital expenditures set forth in the annual budget approved by the Authority for the ordinary renewal, replacement, upgrade and betterment of the Authority Water Supply Facilities. Renewal and Replacement Costs do not include capital expenditures associated with the expansion or addition of water treatment, storage, pumping or transmission capacity."

2.4. Paragraph 16.7 Desoto Payment shall be deleted in its entirety and replaced with the following: "16.7 DeSoto Payment. The Authority shall collect from its

Customers in accordance with Exhibit "A", the DeSoto Payment and remit it to DeSoto. If the quantities of water allocated to the Authority under SWFWMD Water Use Permit Number 20010420.008 are modified and Authority Customer's Water Allocation in Exhibit "B" is amended for more than 34.7 MGD (Annual Average Daily) or if additional entities become Customers of the Authority, then the amount and methodology of the DeSoto Payment to be paid shall be readdressed by all Parties to the Contract."

2.5. Exhibit "A" of the MWSC, entitled Water Allocation is deleted in its entirety and replaced with the Exhibit "A" table attached to this Second Amendment.

IN WITNESS WHEREOF, the Authority, Manatee, Charlotte, DeSoto, Sarasota, and North Port have caused this Second Amendment to be executed effective as of the date first above written.

IN WITNESS WHEREOF, have executed this Second Amendment on the day, month and year first above written.

PEACE RIVER MANASOTA REGIONAL WATER SUPPLY AUTHORITY

WITNESS:

By: _____
John Chappie, Chairman

Date: August 5, 2015

Approved as to form:

General Counsel for Peace River Manasota Regional Water Supply Authority

BOARD APPROVED

AUG - 5 2015

Peace River Manasota
Regional Water Supply Authority

STATE OF FLORIDA
COUNTY OF MANATEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, John Chappie, to me known to be the person described in and who executed the foregoing instrument on behalf of the Peace River Manasota Regional Water Supply Authority and John Chappie, acknowledged before me that John Chappie, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 5th day of August, 2015.

Notary Public
My Commission Expires:

Ann Lee
COMMISSION # FF203768
EXPIRES: February 25, 2019
WWW.AARONNOTARY.COM

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY

By: William G. Truex
Chairman
Date: July 14, 2015

ATTEST:
Barbara T. Scott, Clerk of Circuit Court and Ex-Officio Clerk to the Board of County Commissioners

By: Joanne Lourenz
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

Janette S. Knowlton
Janette S. Knowlton, County Attorney

STATE OF FLORIDA
COUNTY OF CHARLOTTE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Wm G. Truex, to me known to be the person described in and who executed the foregoing instrument on behalf of Charlotte County, and NA, acknowledged before me that Wm G. Truex, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 14th day of July, 2015.

Bonnie S. Stoner
Notary Public
My Commission Expires: 7/6/17

BONNIE S. STONER
MY COMMISSION EXPIRES
July 6, 2017
#FF 020794
Bonded thru
Notary Public Underwriters
NOTARY PUBLIC STATE OF FLORIDA

DESOTO COUNTY
BOARD OF COUNTY COMMISSIONERS

WITNESS:
Mandy J. Hines

MANDY J. HINES

By: _____
Chair
Date: May 26, 2015

Approved as to form:
_____
Attorney for DeSoto County

STATE OF FLORIDA
COUNTY OF DESOTO

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Gabriel Duave, to me known to be the person described in and who executed the foregoing instrument on behalf of DeSoto County, and BOCC, acknowledged before me that Gabriel Duave, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 3rd day of June, 2015.

Jill Thompson
Notary Public
My Commission Expires:

JILL THOMPSON
Notary Public, State of Florida
My Comm. Expires Jan. 29, 2016
Commission No. EE 164593

MANATEE COUNTY
BOARD OF COUNTY COMMISSIONERS

By: _____
Chair
Date: June 16, 2015

ATTEST: R. B. SHORE
Clerk of Circuit Court
By: _____
Deputy Clerk

STATE OF FLORIDA
COUNTY OF MANATEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Betsy Benac, to me known to be the person described in and who executed the foregoing instrument on behalf of Manatee County, and _____, acknowledged before me that _____, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 16th day of June, 2015.

KATHLEEN C. ELLIS
Notary Public - State of Florida
My Comm. Expires Jun 17, 2015
Commission # EE 96572
Bonded Through National Notary Assn.

Kathleen C Ellis
Notary Public
My Commission Expires: 6-17-2015

WITNESS:

Charles Maloney

SARASOTA COUNTY
BOARD OF COUNTY COMMISSIONERS

By: Carolyn J. Mason
Chair

Date: 7/7/15

Approved as to form:

Attorney for Sarasota County

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Carolyn J. Mason, to me known to be the person described in and who executed the foregoing instrument on behalf of Sarasota County, and she, acknowledged before me that she, executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 7th day of July, 2015.

JoAnn D Mann
Notary Public
My Commission Expires:

JO ANN D. MANN
Notary Public - State of Florida
My Comm. Expires Jul 18, 2018
Commission # FF 104410

CITY OF NORTH PORT

WITNESS:

Beth Scott

By: Rhonda DiFranco
Mayor

Date: 6-8-15

Approved as to form:

Attorney for City of North Port

ATTEST:
Helen M. Raimbeau
Helen M. Raimbeau, MMC
City Clerk

STATE OF FLORIDA
COUNTY OF SARASOTA

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgements, personally appeared, Mayor Rhonda Y. DiFranco, to me known to be the person described in and who executed the foregoing instrument on behalf of the City of North Port, and _____, acknowledged before me that Rhonda DiFranco executed same as a free act and deed for the uses and purposes therein stated.

WITNESS my hand and official seal in the County and State last aforesaid this 8th day of June, 2015.

CYNTHIA D. KELLY
MY COMMISSION # FF062012
EXPIRES: November 24, 2017

Cynthia D Kelly
Notary Public
My Commission Expires: 11/24/17

EXHIBIT "A"

DeSoto Payment Schedule
(approved 2015)

DeSoto Payment (Annual Assessment)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	$368,564	$15,889	$101,111	$34,436	$520,000
FY06	$368,564	$15,889	$101,111	$34,436	$520,000
FY07	$368,564	$15,889	$101,111	$34,436	$520,000
FY08	$368,564	$15,889	$101,111	$34,436	$520,000
FY09	$361,403	$15,424	$177,073	$44,346	$598,247
FY10	$363,140	$15,341	$244,396	$53,586	$676,463
FY11	$369,266	$15,482	$303,326	$61,927	$750,000
FY12	$369,266	$15,482	$303,326	$61,927	$750,000
FY13	$369,266	$15,482	$303,326	$61,927	$750,000
FY14	$369,266	$15,482	$303,326	$61,927	$750,000
FY15	$369,266	$15,482	$303,326	$61,927	$750,000
FY16	$369,266	$15,482	$345,541	$65,711	$796,000
Remaining Years	$369,266	$15,482	$345,541	$65,711	$796,000

EXHIBIT "B"

Water Allocation
(approved 2015)

Annual Average Daily (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	12.525	0.535	3.048	1.192	17.300
FY06	12.758	0.550	3.500	1.192	18.000
FY07	12.758	0.550	3.500	1.192	18.000
FY08	12.758	0.550	3.500	1.192	18.000
FY09	13.895	0.593	6.808	1.705	23.001
FY10	15.031	0.635	10.116	2.218	28.000
FY11	16.100	0.675	13.225	2.700	32.700
FY12	16.100	0.675	13.225	2.700	32.700
FY13	16.100	0.675	13.225	2.700	32.700
FY14	16.100	0.675	13.225	2.700	32.700
FY15	16.100	0.675	13.225	2.700	32.700
FY16	16.100	0.675	15.060	2.865	34.700
Remaining Years*	16.100	0.675	15.060	2.865	34.700

Peak Monthly Average Day (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	15.030	0.642	3.658	3.146	22.476
FY06	15.310	0.660	4.200	3.146	23.316
FY07	15.310	0.660	4.200	3.146	23.316
FY08	15.310	0.660	4.200	3.146	23.316
FY09	16.187	0.690	7.931	3.146	27.954
FY10	17.512	0.740	11.785	3.146	33.183
FY11	18.757	0.786	15.407	3.146	38.096
FY12	18.757	0.786	15.407	3.146	38.096
FY13	18.757	0.786	15.407	3.146	38.096
FY14	18.757	0.786	15.407	3.146	38.096
FY15	18.757	0.786	15.407	3.146	38.096
FY16	19.320	0.810	18.084	3.438	41.652
Remaining Years*	19.320	0.810	18.084	3.438	41.652

Maximum Day (MGD)					
Contract Fiscal Year	Charlotte County	DeSoto County	Sarasota County	City of North Port	Total
FY05	17.535	0.749	4.267	3.780	26.331
FY06	17.861	0.770	4.900	3.780	27.311
FY07	17.861	0.770	4.900	3.780	27.311
FY08	17.861	0.770	4.900	3.780	27.311
FY09	19.453	0.830	9.531	3.780	33.594
FY10	21.043	0.889	14.162	3.780	39.874
FY11	22.540	0.945	18.515	3.780	45.780
FY12	22.540	0.945	18.515	3.780	45.780
FY13	22.540	0.945	18.515	3.780	45.780
FY14	22.540	0.945	18.515	3.780	45.780
FY15	22.540	0.945	18.515	3.780	45.780
FY16	22.540	0.945	21.084	4.011	48.580
Remaining Years*	22.540	0.945	21.084	4.011	48.580

Annual Average Day, Peak Monthly Average Day, Maximum Day are expressed in million gallons per day (MGD).

*Remaining Years means the remaining years of the term of this MWSC.

EXHIBIT "C"
New Water Supply Demands
(approved 2015)

Annual Average Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY15	0.000	0.000	0.000	0.000	0.000	0.000
FY16	0.000	0.000	0.000	0.000	0.000	0.000
FY17	0.000	0.000	0.000	0.000	0.000	0.000
FY18	0.000	0.000	0.000	0.000	0.000	0.000
FY19	0.000	0.000	0.000	0.000	0.000	0.000
FY20	0.000	0.000	0.000	0.000	0.000	0.000
FY21	0.000	0.000	0.000	0.000	0.000	0.000
FY22	0.000	0.000	0.000	0.000	0.000	0.000

Peak Month Average Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY15	0.000	0.000	0.000	0.000	0.000	0.000
FY16	0.000	0.000	0.000	0.000	0.000	0.000
FY17	0.000	0.000	0.000	0.000	0.000	0.000
FY18	0.000	0.000	0.000	0.000	0.000	0.000
FY19	0.000	0.000	0.000	0.000	0.000	0.000
FY20	0.000	0.000	0.000	0.000	0.000	0.000
FY21	0.000	0.000	0.000	0.000	0.000	0.000
FY22	0.000	0.000	0.000	0.000	0.000	0.000

Maximum Daily Quantity (MGD)						
Fiscal Year	Charlotte County	DeSoto County	Manatee County	Sarasota County	City of North Port	Total
FY15	0.000	0.000	0.000	0.000	0.000	0.000
FY16	0.000	0.000	0.000	0.000	0.000	0.000
FY17	0.000	0.000	0.000	0.000	0.000	0.000
FY18	0.000	0.000	0.000	0.000	0.000	0.000
FY19	0.000	0.000	0.000	0.000	0.000	0.000
FY20	0.000	0.000	0.000	0.000	0.000	0.000
FY21	0.000	0.000	0.000	0.000	0.000	0.000
FY22	0.000	0.000	0.000	0.000	0.000	0.000

Annual Average Day, Peak Month Average Day and Maximum Day are expressed in million gallons per day (MGD).

Attachment 2

Interlocal/Emergency Agreements

AG 94-165

FIRST AMENDMENT TO CITY OF NORTH PORT, FLORIDA/CHARLOTTE COUNTY INTERLOCAL UTILITY AGREEMENT

THIS AGREEMENT is made and entered into this 6th day of September, 1994, by and between the CITY OF NORTH PORT, FLORIDA, a municipal corporation created under the laws of the State of Florida (hereafter "NORTH PORT"), and CHARLOTTE COUNTY, a political subdivision of the State of Florida (hereafter "CHARLOTTE").

RECITALS

1. NORTH PORT and CHARLOTTE executed the City of North Port, Florida/Charlotte County Interlocal Utility Agreement (hereafter "Original Interlocal Utility Agreement") on May 30, 1991.

2. NORTH PORT acquired the Myakkahatchee Creek Water Treatment Plant on December 9, 1992, as contemplated in subsection 4.2(5) of the Original Interlocal Utility Agreement.

3. NORTH PORT provided water service to CHARLOTTE as contemplated in subsection 3.1 of the Original Interlocal Utility Agreement.

4. A good faith dispute arose between the parties as to the rate which should be charged to CHARLOTTE by NORTH PORT pursuant to the Original Interlocal Utility Agreement.

5. The parties held a joint public hearing pursuant to Section 164.103, Florida Statutes, to fulfill their statutory duty to negotiate and discuss their dispute in an effort to amicably settle the controversy.

6. NORTH PORT and CHARLOTTE mediated the dispute on August 29, 1994, at the South Sarasota County Administration Center.

7. A recommended settlement document was signed by the respective chairmen of NORTH PORT and CHARLOTTE and the legal counsel representing NORTH PORT and CHARLOTTE during the mediation, which settlement document is attached to and incorporated in this Agreement as Exhibit "A."

8. The parties have now decided to resolve their dispute through the payment by CHARLOTTE to NORTH PORT for water

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service previously rendered and through the express inclusion of the legal principle in the Agreement that neither NORTH PORT nor CHARLOTTE can contract for the delivery of water service below the cost of the water producer to produce the water.

9. NORTH PORT and CHARLOTTE now wish to memorialize the recommended settlement document and their agreements in writing.

10. Section 18 of the Original Interlocal Utility Agreement provides that amendments to the provisions of that agreement must be entered into in writing by formal amendment.

11. NORTH PORT and CHARLOTTE covenant and agree that they have the power and authority to enter into this agreement and bind themselves according to the provisions of this agreement.

ACCORDINGLY, and in consideration of the above stated recitals and other good and valuable mutual consideration, the receipt and sufficiency of which is hereby acknowledged by the parties, the parties agree as follows:

SECTION 1. RECITALS. The above Recitals are true and correct, and form a material part of this Agreement.

SECTION 2. PAYMENT BY CHARLOTTE TO NORTH PORT. In settlement of all past claims of which NORTH PORT has alleged are due and owing to it from CHARLOTTE, CHARLOTTE agrees to pay and NORTH PORT agrees to accept **NINE HUNDRED THOUSAND DOLLARS ($900,000.00)** to be paid in the following manner:

(1) CHARLOTTE shall pay **TWO HUNDRED THOUSAND DOLLARS ($200,000.00)** to NORTH PORT on the date of execution of this agreement, and

(2) Beginning on January 1, 1995, and on each January 1 thereafter for the next four calendar years (that is, through January 1, 1999), CHARLOTTE shall pay to NORTH PORT **ONE HUNDRED FORTY THOUSAND DOLLARS ($140,000.00)** for a total of **SEVEN HUNDRED THOUSAND DOLLARS ($700,000.00)** in five equal annual installments.

In consideration and upon the payment in full of said **NINE HUNDRED THOUSAND DOLLARS ($900,000.00)** by CHARLOTTE, NORTH PORT agrees that it shall release and forever discharge CHARLOTTE of and from any and all claims, actions, suits and controversies arising out of or related to amounts due and owing up to and including January 17, 1994, for water delivered from NORTH PORT to CHARLOTTE.

SECTION 3. AMENDMENT TO SUBSECTION 3.2. The parties hereby amend subsection 3.2, page 8, of the Original Interlocal Utility Agreement as follows:

"3.2. Water Service; Purchase and Payments. In providing water service under this agreement, NORTH PORT and CHARLOTTE agree to charge for the delivery of said water service from one to the other at a Rate that is based upon and reflects the actual cost of the providing party in delivering said water service. Until January 1, 1995, the parties agree that they shall charge each other $1.90 per thousand gallons for water consumed by the parties from one to another, and after that date, NORTH PORT and CHARLOTTE shall be free to set their respective rates based upon their respective actual costs as set forth in this subsection 3.2. Notwithstanding any thing to the contrary contained in section 6 of the Original Interlocal Utility Agreement, this subsection 3.2 shall control as to the establishment of rates, fees, and charges established, set or promulgated by NORTH PORT to CHARLOTTE and CHARLOTTE to NORTH PORT, even if said rates, fees, charges differ and are not equal to the other on or after January 1, 1995. Rates, fees, and charges set by either party shall be promulgated from time to time in rate resolutions or ordinances."

SECTION 4. AMENDMENT TO SECTION 6. The parties hereby amend section 6, pages 25 and 26 of the Original Interlocal Utility Agreement as follows:

"SECTION 6. CHANGE OF RATES. In the event either party or MANASOTA, during the term of this Agreement, shall propose any new rate schedule or amended rate schedule applicable to water service furnished by that party to the other party, the party proposing the new or amended rate shall forward to the other party a copy of such rate schedule or amended rate schedule prior to the effective date thereof. Any increase or decrease in rates shall be consistent with state law and the terms and conditions of this Agreement. Furthermore, the parties agree to provide to each other written notice in accordance with Section 11 of this agreement of any proposed increase in rates charged under this Agreement, no less than seventy-five (75) days prior to the adoption of any such rate. Aggregate amounts owed hereunder will of course vary based upon consumption, and shall be paid from the consuming party to the distributing party within thirty (30) days of receipt of each billing.

SECTION 5. EFFECT OF FIRST AMENDMENT. This agreement constitutes an amendment to the Original Interlocal Utility Agreement. Except as expressly amended and set forth herein, nothing contained in this Agreement shall be construed to amend, modify, change, or repeal any of the provisions of the Original Interlocal Utility Agreement.

IN WITNESS WHEREOF, the Parties hereto have hereunder executed this agreement on the date and year first above written.

SEAL

ATTEST:

City Clerk

CITY OF NORTH PORT, FLORIDA

By: _____
Benjamin Hardin, Chairman
City Council

Date: September 6, 1994

ATTEST:

Clerk to the Board of County Commissioners of Charlotte County, Florida

BOARD OF COUNTY COMMISSIONERS OF CHARLOTTE COUNTY, FLORIDA

By: _____
Richard Leonard, Chairman
County Commission

Date: 9-6-94

As authorized for execution by the Board of County Commissioners at their Sept 6, 1994 regular meeting.

For the use and reliance of CHARLOTTE COUNTY only.

Approved as to form and legal sufficiency.

Matthew G. Minter, Special Counsel to Charlotte County

Date: _____

For the use and reliance of the CITY OF NORTH PORT, FLORIDA

Approved as to form and legal sufficiency.

Thomas A. Cloud, Esquire
Special Counsel and City Attorney for Public Utilities

Date: SEPTEMBER 6, 1994

EXHIBIT "A"

SETTLEMENT

1. The City of North Port ("City") and Charlotte County ("County") have mediated a dispute over payment for water consumed by the County from December 1992 to January 1994.

2. After due deliberations, the City and the County representatives have reached accord on the basis for settling this dispute.

3. The City and the County representatives agree to present the following settlement agreement to their respective commissions:

3.1. The County shall pay the City for the past due amounts in the amount of $900,000.00, to be paid as follows: (1) $200,000.00 upon execution of the settlement agreement, + (2) $140,000.00 per year for the next 5 calendar years both the first payment due January 1, 1995 and then each January thereafter.

3.2. Henceforth, the parties shall charge for water consumed at $1.90 per thousand gallons until January 1, 1995, went rates for water consumed shall be set based upon the actual costs to the provider party of producing

the water.

4. The City and County representatives shall prepare an amendment to the May 30, 1991 Interlocal Utility Agreement to incorporate these terms as soon as possible, and shall present this settlement agreement for approval and execution by the County and the City.

THE CITY OF NORTH PORT

BEN HARDIN, CHAIRMAN

DATE: August 29, 1994

THOMAS A. CLOUD

CHARLOTTE COUNTY

RICHARD LEONARD, CHAIRMAN

DATE: AUGUST 29, 1994

MATTHEW G. MINTER

IMAGED
12/13/96
AR

AG 94-165

FIRST AMENDMENT TO CITY OF NORTH PORT, FLORIDA/CHARLOTTE COUNTY INTERLOCAL UTILITY AGREEMENT

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RECITALS

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3. NORTH PORT provided water service to CHARLOTTE as contemplated in subsection 3.1 of the Original Interlocal Utility Agreement.

4. A good faith dispute arose between the parties as to the rate which should be charged to CHARLOTTE by NORTH PORT pursuant to the Original Interlocal Utility Agreement.

5. The parties held a joint public hearing pursuant to Section 164.103, Florida Statutes, to fulfill their statutory duty to negotiate and discuss their dispute in an effort to amicably settle the controversy.

6. NORTH PORT and CHARLOTTE mediated the dispute on August 29, 1994, at the South Sarasota County Administration Center.

7. A recommended settlement document was signed by the respective chairmen of NORTH PORT and CHARLOTTE and the legal counsel representing NORTH PORT and CHARLOTTE during the mediation, which settlement document is attached to and incorporated in this Agreement as Exhibit "A."

8. The parties have now decided to resolve their dispute through the payment by CHARLOTTE to NORTH PORT for water

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10. Section 18 of the Original Interlocal Utility Agreement provides that amendments to the provisions of that agreement must be entered into in writing by formal amendment.

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In consideration and upon the payment in full of said **NINE HUNDRED THOUSAND DOLLARS ($900,000.00)** by CHARLOTTE, NORTH PORT agrees that it shall release and forever discharge CHARLOTTE of and from any and all claims, actions, suits and controversies arising out of or related to amounts due and owing up to and including January 17, 1994, for water delivered from NORTH PORT to CHARLOTTE.

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SECTION 5. EFFECT OF FIRST AMENDMENT. This agreement constitutes an amendment to the Original Interlocal Utility Agreement. Except as expressly amended and set forth herein, nothing contained in this Agreement shall be construed to amend, modify, change, or repeal any of the provisions of the Original Interlocal Utility Agreement.

IN WITNESS WHEREOF, the Parties hereto have hereunder executed this agreement on the date and year first above written.

SEAL

ATTEST:

City Clerk

CITY OF NORTH PORT, FLORIDA

By: _____
Benjamin Hardin, Chairman
City Council

Date: September 6, 1994

ATTEST:

Clerk to the Board of County Commissioners of Charlotte County, Florida

BOARD OF COUNTY COMMISSIONERS OF CHARLOTTE COUNTY, FLORIDA

By: _____
Richard Leonard, Chairman
County Commission

Date: 9-6-94

As authorized for execution by the Board of County Commissioners at their Sept 6, 1994 regular meeting.

For the use and reliance of CHARLOTTE COUNTY only.

Approved as to form and legal sufficiency.

Matthew G. Minter, Special Counsel to Charlotte County

Date: _____

For the use and reliance of the CITY OF NORTH PORT, FLORIDA

Approved as to form and legal sufficiency.

Thomas A. Cloud, Esquire
Special Counsel and City Attorney for Public Utilities

Date: SEPTEMBER 6, 1994

EXHIBIT "A"

SETTLEMENT

1. The City of North Port ("City") and Charlotte County ("County") have mediated a dispute over payment for water consumed by the County from December 1992 to January 1994.

2. After due deliberations, the City and the County representatives have reached accord on the basis for settling this dispute.

3. The City and the County representatives agree to present the following settlement agreement to their respective commissions:

3.1. The County shall pay the City for the past due amounts in the amount of $900,000.00, to be paid as follows: (1) $200,000.00 upon execution of the settlement agreement, + (2) $140,000.00 per year for the next 5 calendar years both the first payment due January 1, 1995 and then each January thereafter.

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the water.

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THE CITY OF NORTH PORT

BEN HARDIN, CHAIRMAN

DATE: August 29, 1994

THOMAS A. CLOUD

CHARLOTTE COUNTY

RICHARD LEONARD, CHAIRMAN

DATE: AUGUST 29, 1994

MATTHEW G. MINTER

IMAGED
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AGR 2006-039

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INTERLOCAL AGREEMENT
FOR SALE AND PURCHASE OF WATER

THIS INTERLOCAL AGREEMENT FOR SALE AND PURCHASE OF WATER ("AGREEMENT") is made and entered into this 8th day of August, 2006, by and between **CHARLOTTE COUNTY**, a political subdivision of the State of Florida, hereinafter referred to as **"COUNTY,"** and **THE ENGLEWOOD WATER DISTRICT**, an independent special district of the State of Florida, hereinafter referred to as **"DISTRICT,"** collectively referred to as the **"PARTIES."**

WITNESSETH:

WHEREAS, both the COUNTY and the DISTRICT are authorized to enter into interlocal agreements, pursuant to Chapter 163, Florida Statutes; and

WHEREAS, the COUNTY and the DISTRICT each own and operate public water supply treatment and distribution systems which provide service to their respective customers; and

WHEREAS, the COUNTY and the DISTRICT wish to establish a mechanism for the transfer of water from one system to the other as needed and convenient, and for public purposes, as agreed upon by the PARTIES; and

WHEREAS, the COUNTY acknowledges that the DISTRICT could in the future become one of the COUNTY's suppliers of potable water; and

WHEREAS, to that end, the COUNTY and the DISTRICT plan to construct certain improvements that provide for the connection of their respective water distribution systems so as to permit the transfer of water from one system to the other.

NOW, THEREFORE, for and in consideration of the mutual covenants and premises contained herein, the PARTIES hereby agree as follows:

1. **PURPOSE.** The purpose of this Agreement is to provide the authorization and framework for the PARTIES to construct an interconnect to transfer water from one water distribution system to the other, to establish certain procedures for the sale and purchase of such water, and to ensure adequate protections for the two systems. Each party shall pay for and construct a twelve (12)-inch water

BARBARA T. SCOTT, CLERK, CHARLOTTE COUNTY
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transmission main to the site of the point-of-connection (in the vicinity of the northwest corner of Winchester Boulevard and SR 776 or a point within the same geographic area mutually agreed upon by the PARTIES), with both PARTIES making a good faith effort, subject to permitting requirements, to begin construction by the end of 2006 and complete construction during 2007.

2. **TERM.** The term of this Agreement shall be twenty (20) years from its effective date.

3. **RATE OF SUPPLY.** The maximum rate of supply from the selling party shall not exceed a rate in gallons per minute that would be detrimental or harmful to the selling party's system. The rate of supply will be determined at the sole discretion of the selling party. The selling party shall not be required to draw water in excess of its Water Use Permits, and shall not be liable to the purchasing party or its customers for any interruptions of water service provided hereunder.

4. **PRICE.** Water supplied by either party under this Agreement and distributed through the point-of-connection shall initially be charged at the highest (as between the PARTIES) approved bulk (or government, if such a rate exists) water sales rate, which is subject to change from time to time, in addition to a processing fee of $25.00 per billing. An "energy surcharge" may be added to the cost per 1,000 gallons if the Florida Power & Light (FPL) cost per kilowatt-hour increases by more than five percent (5%) during any one-year period of time as evidenced by FPL billings. The "energy surcharge" will cover the unit-cost driven increase of electrical energy as metered at the water treatment facilities. The billing rate under this Agreement shall always be the same for both PARTIES.

5. **WATER QUALITY.** Water supplied hereunder shall be of the same quality as that furnished by the selling party to its own customers, and said quality shall not be less than that required to meet the minimum requirements established by the Florida Department of Environmental Protection, as may be amended from time to time.

6. **WATER QUANTITY.** By February 1 of each year, the District will send a notice to the COUNTY of how much water will be available for purchase during the following calendar year. Within 30 days of the DISTRICT'S notice, the COUNTY will respond to the DISTRICT with the amount of water it desires to purchase during the following calendar year. The amount to be purchased may be revised at any

time during the year upon written notice by the party requesting the change and written acceptance by the other party.

7. **BILLING AND PAYMENT.** The selling party shall bill on or around the last day of the month for all water sold hereunder during the month. Bills not paid within forty-five (45) days of receipt shall be deemed delinquent and shall be assessed a one and one-half percent (1½%) per month late charge. The purchasing party shall pay all costs, including a reasonable attorney's fee, which may be incurred by the selling party in collecting any delinquent charges. The selling party, in addition to any other available remedies, after five (5) days advance notice, may terminate water service in the event the purchasing party fails to pay all or a portion of a bill for more than twenty (20) days after said bill becomes delinquent.

8. **WATER METER INSTALLATION AND CALIBRATION.** A bi-directional water meter, gate valves, and appurtenances of a type and design as approved by the DISTRICT and the COUNTY will be installed by the DISTRICT at the point-of-connection. The PARTIES shall equally share the cost of the metering device(s), gate valves, approved SCADA system and appurtenances and the installation of same. The meter(s) shall be jointly owned by the DISTRICT and the COUNTY. Each party shall be responsible for design, permitting and construction of any water transmission mains that may be required to transfer water through the point-of-connection on its respective side of the meter.

Annual meter calibration shall be performed by a qualified third party mutually agreeable to both PARTIES, with costs split equally. For any additional testing, the requesting party shall bear the cost of such meter examinations, tests and adjustments. If a meter test discloses a deviation of more than three percent (3%), the meter shall be corrected. If either party overpaid due to such deviation, the amount of the overpayment will be credited to that party on the next scheduled billing, or within 60 days.

A booster station will be used to equalize pressure between the two systems.

9. **NOT A COMBINED SYSTEM.** The purpose of this Agreement is to make excess water supply available between the PARTIES. It is not the intent of this Agreement to form a combined water supply system that would invoke Federal Environmental Protection Agency or DEP rules not otherwise applicable to the separate DISTRICT or COUNTY systems.

10. **RENEWAL.** This Agreement shall automatically be extended from year to year after the initial term, unless one party notifies the other in writing on or before the first day of January in the year in which expiration of this Agreement is desired.

11. **NOTICES.** In the event a party hereunder desires or is required to provide any notice to the other party, the party desiring or required to provide such notice shall provide it in writing, and hand-deliver it to the other party at the address listed below, or send it by U.S. Certified Mail, return receipt requested, postage propaid, to the other party at the address listed below:

If to the COUNTY: Bruce Loucks, County Administrator
18500 Murdock Circle
Port Charlotte, FL 33948

If to the DISTRICT: Richard L. Rollo, P.E., Administrator
Englewood Water District
201 Selma Avenue
Englewood, FL 34223

12. **AMENDMENT TO THIS AGREEMENT.** This Agreement may be amended only by written consent of both PARTIES.

13. **EXECUTION.** This Agreement shall be executed in duplicate, with each duplicate considered an original.

14. **DISCLAIMER OF THIRD PARTY BENEFICIARIES.** This Agreement is solely for the benefit of the PARTIES to this Agreement. No right or cause of action shall accrue upon or by reason hereof inure to or for the benefit of any third party.

15. **ASSIGNMENT.** This Agreement shall be binding on the PARTIES, their representatives, successors and assigns. Neither party shall assign this Agreement or the rights or obligations hereof to any other person or entity without the prior written consent of the other party.

16. **INDEMNIFICATION.** Neither party shall indemnify the other party. Each party acknowledges that its legal remedy shall be limited to filing suit against the other party to this Agreement in a court of competent jurisdiction.

17. **DISPUTES.** Any dispute involving litigation between the COUNTY and the DISTRICT is subject to all provisions of Chapter 164, Florida Statutes.

18. **SEVERABILITY.** If any part of this Agreement is found invalid or unenforceable by any court, such invalidity or unenforceability shall not affect the other parts of the Agreement, if the rights and obligations of the PARTIES contained herein are not materially prejudiced and if the intentions of the PARTIES continue to be effected.

19. **APPLICABLE LAW.** This Agreement and the provisions contained herein shall be construed, controlled and interpreted according to the laws of the State of Florida.

20. **COOPERATION.** Both PARTIES to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions (including but not limited to pursuing any water use permit amendments) that may be necessary or appropriate to give full force and effect to the terms and to the intent of this Agreement.

21. **EFFECTIVE DATE.** This Agreement shall take effect upon filing a fully executed copy with the Clerk of the Circuit Court of Charlotte County.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement for the purpose herein expressed.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By: _____
~~Thomas G. Moore, Chairman~~
Tom D'Aprile, Vice Chairman

ATTEST:
Barbara T. Scott, Clerk Of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By: _____
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

_____
Janette S. Knowlton, County Attorney

MB

ENGLEWOOD WATER DISTRICT
An Independent Special District

BY: _____
Paul J. Phillips, Chairman, Board of Supervisors

APPROVED AS TO FORM:

BY: _____
Robert H. Berntsson, District Counsel

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF:

BY: _____
Maureen Cronk, Secretary to the Board of Supervisors

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INTERLOCAL AGREEMENT
FOR SALE AND PURCHASE OF WATER

THIS INTERLOCAL AGREEMENT FOR SALE AND PURCHASE OF WATER ("AGREEMENT") is made and entered into this _____ day of _____, 2006, by and between **CHARLOTTE COUNTY**, a political subdivision of the State of Florida, hereinafter referred to as **"COUNTY,"** and **THE ENGLEWOOD WATER DISTRICT**, an independent special district of the State of Florida, hereinafter referred to as **"DISTRICT,"** collectively referred to as the **"PARTIES."**

W I T N E S S E T H:

WHEREAS, both the COUNTY and the DISTRICT are authorized to enter into interlocal agreements, pursuant to Chapter 163, Florida Statutes; and

WHEREAS, the COUNTY and the DISTRICT each own and operate public water supply treatment and distribution systems which provide service to their respective customers; and

WHEREAS, the COUNTY and the DISTRICT wish to establish a mechanism for the transfer of water from one system to the other as needed and convenient, and for public purposes, as agreed upon by the PARTIES; and

WHEREAS, the COUNTY acknowledges that the DISTRICT could in the future become one of the COUNTY's suppliers of potable water; and

WHEREAS, to that end, the COUNTY and the DISTRICT plan to construct certain improvements that provide for the connection of their respective water distribution systems so as to permit the transfer of water from one system to the other.

NOW, THEREFORE, for and in consideration of the mutual covenants and premises contained herein, the PARTIES hereby agree as follows:

1. PURPOSE. The purpose of this Agreement is to provide the authorization and framework for the PARTIES to construct an interconnect to transfer water from one water distribution system to the other, to establish certain procedures for the sale and purchase of such water, and to ensure adequate protections for the two systems. Each party shall pay for and construct a twelve (12)–inch water

transmission main to the site of the point-of-connection (in the vicinity of the northwest corner of Winchester Boulevard and SR 776 or a point within the same geographic area mutually agreed upon by the PARTIES), with both PARTIES making a good faith effort, subject to permitting requirements, to begin construction by the end of 2006 and complete construction during 2007.

2. **TERM.** The term of this Agreement shall be twenty (20) years from its effective date.

3. RATE OF SUPPLY. The maximum rate of supply from the selling party shall not exceed a rate in gallons per minute that would be detrimental or harmful to the selling party's system. The rate of supply will be determined at the sole discretion of the selling party. The selling party shall not be required to draw water in excess of its Water Use Permits, and shall not be liable to the purchasing party or its customers for any interruptions of water service provided hereunder.

4. PRICE. Water supplied by either party under this Agreement and distributed through the point-of-connection shall initially be charged at the highest (as between the PARTIES) approved bulk (or government, if such a rate exists) water sales rate, which is subject to change from time to time, in addition to a processing fee of **$25.00** per billing. An "energy surcharge" may be added to the cost per 1,000 gallons if the Florida Power & Light (FPL) cost per kilowatt-hour increases by more than five percent (5%) during any one-year period of time as evidenced by FPL billings. The "energy surcharge" will cover the unit-cost driven increase of electrical energy as metered at the water treatment facilities. The billing rate under this Agreement shall always be the same for both PARTIES.

5. WATER QUALITY. Water supplied hereunder shall be of the same quality as that furnished by the selling party to its own customers, and said quality shall not be less than that required to meet the minimum requirements established by the Florida Department of Environmental Protection, as may be amended from time to time.

6. WATER QUANTITY. By February 1 of each year, the District will send a notice to the COUNTY of how much water will be available for purchase during the following calendar year. Within 30 days of the DISTRICT'S notice, the COUNTY will respond to the DISTRICT with the amount of water it desires to purchase during the following calendar year. The amount to be purchased may be revised at any

time during the year upon written notice by the party requesting the change and written acceptance by the other party.

7. BILLING AND PAYMENT. The selling party shall bill on or around the last day of the month for all water sold hereunder during the month. Bills not paid within forty-five (45) days of receipt shall be deemed delinquent and shall be assessed a one and one-half percent (1½%) per month late charge. The purchasing party shall pay all costs, including a reasonable attorney's fee, which may be incurred by the selling party in collecting any delinquent charges. The selling party, in addition to any other available remedies, after five (5) days advance notice, may terminate water service in the event the purchasing party fails to pay all or a portion of a bill for more than twenty (20) days after said bill becomes delinquent.

8. WATER METER INSTALLATION AND CALIBRATION. A bi-directional water meter, gate valves, and appurtenances of a type and design as approved by the DISTRICT and the COUNTY will be installed by the DISTRICT at the point-of-connection. The PARTIES shall equally share the cost of the metering device(s), gate valves, approved SCADA system and appurtenances and the installation of same. The meter(s) shall be jointly owned by the DISTRICT and the COUNTY. Each party shall be responsible for design, permitting and construction of any water transmission mains that may be required to transfer water through the point-of-connection on its respective side of the meter.

Annual meter calibration shall be performed by a qualified third party mutually agreeable to both PARTIES, with costs split equally. For any additional testing, the requesting party shall bear the cost of such meter examinations, tests and adjustments. If a meter test discloses a deviation of more than three percent (3%), the meter shall be corrected. If either party overpaid due to such deviation, the amount of the overpayment will be credited to that party on the next scheduled billing, or within 60 days.

A booster station will be used to equalize pressure between the two systems.

9. NOT A COMBINED SYSTEM. The purpose of this Agreement is to make excess water supply available between the PARTIES. It is not the intent of this Agreement to form a combined water supply system that would invoke Federal Environmental Protection Agency or DEP rules not otherwise applicable to the separate DISTRICT or COUNTY systems.

10. **RENEWAL.** This Agreement shall automatically be extended from year to year after the initial term, unless one party notifies the other in writing on or before the first day of January in the year in which expiration of this Agreement is desired.

11. **NOTICES.** In the event a party hereunder desires or is required to provide any notice to the other party, the party desiring or required to provide such notice shall provide it in writing, and hand-deliver it to the other party at the address listed below, or send it by U.S. Certified Mail, return receipt requested, postage prepaid, to the other party at the address listed below:

If to the COUNTY: Bruce Loucks, County Administrator
18500 Murdock Circle
Port Charlotte, FL 33948

If to the DISTRICT: Richard L. Rollo, P.E., Administrator
Englewood Water District
201 Selma Avenue
Englewood, FL 34223

12. **AMENDMENT TO THIS AGREEMENT.** This Agreement may be amended only by written consent of both PARTIES.

13. **EXECUTION.** This Agreement shall be executed in duplicate, with each duplicate considered an original.

14. **DISCLAIMER OF THIRD PARTY BENEFICIARIES.** This Agreement is solely for the benefit of the PARTIES to this Agreement. No right or cause of action shall accrue upon or by reason hereof inure to or for the benefit of any third party.

15. **ASSIGNMENT.** This Agreement shall be binding on the PARTIES, their representatives, successors and assigns. Neither party shall assign this Agreement or the rights or obligations hereof to any other person or entity without the prior written consent of the other party.

16. **INDEMNIFICATION.** Neither party shall indemnify the other party. Each party acknowledges that its legal remedy shall be limited to filing suit against the other party to this Agreement in a court of competent jurisdiction.

17. **DISPUTES.** Any dispute involving litigation between the COUNTY and the DISTRICT is subject to all provisions of Chapter 164, Florida Statutes.

18. **SEVERABILITY.** If any part of this Agreement is found invalid or unenforceable by any court, such invalidity or unenforceability shall not affect the other parts of the Agreement, if the rights and obligations of the PARTIES contained herein are not materially prejudiced and if the intentions of the PARTIES continue to be effected.

19. **APPLICABLE LAW.** This Agreement and the provisions contained herein shall be construed, controlled and interpreted according to the laws of the State of Florida.

20. **COOPERATION.** Both PARTIES to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions (including but not limited to pursuing any water use permit amendments) that may be necessary or appropriate to give full force and effect to the terms and to the intent of this Agreement.

21. **EFFECTIVE DATE.** This Agreement shall take effect upon filing a fully executed copy with the Clerk of the Circuit Court of Charlotte County.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement for the purpose herein expressed.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By:_____
Thomas G. Moore, Chairman

ATTEST:
Barbara T. Scott, Clerk Of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By:_____
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

_____
Janette S. Knowlton, County Attorney

ENGLEWOOD WATER DISTRICT
An Independent Special District

BY: _____
Paul J. Phillips, Chairman, Board of Supervisors

APPROVED AS TO FORM:

BY: _____
Robert H. Berntsson, District Counsel

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF:

BY: _____
Maureen Cronk, Secretary to the Board of Supervisors

p:\wpdata\burton\agreements\EWDwaterinterconnect.revised.doc
LR06-288/2/16/2023

City of Punta Gorda, Florida
OFFICE OF THE CITY CLERK
(941) 575-3369

CITY HALL
326 WEST MARION AVENUE
PUNTA GORDA, FLORIDA 33950-4492

December 8, 2006

06 DEC 11 AM 10:55
COUNTY ADMINISTRATOR'S OFFICE

Mr. Bruce Loucks
County Administrator
Charlotte County Administration Center
18500 Murdock Circle
Port Charlotte, FL 33948-1094

RE: **Interlocal Agreement between Charlotte County and the City of Punta Gorda Water Interconnect**

Dear Mr. Loucks:

Enclosed is an original agreement as approved by City Council and signed by Mayor Larry Friedman on December 7, 2006.

Should you need further assistance, please do not hesitate to contact us.

Sincerely,

Sue Foster

Sue Foster, CMC
City Clerk

SF/sls

cc: File

R:\Clerk Correspondence\Loucks Agreement Return Water Interconnect.DOC

Jeff Pearson

AGR 2006-061

INTERLOCAL AGREEMENT BETWEEN
CHARLOTTE COUNTY AND CITY OF PUNTA GORDA
FOR WATER INTERCONNECT

This Interlocal Agreement ("Agreement") is made and entered into this 6th day of December, 2006, by and between Charlotte County, a political subdivision of the State of Florida ("County"), and the City of Punta Gorda, a Florida municipal corporation ("City"), collectively "the Parties."

WITNESSETH:

WHEREAS, pursuant to Chapter 163, Florida Statues, the Parties are authorized to enter into interlocal agreements to make the best use of their powers by enabling them to cooperate with one another on a basis of mutual advantage; and

WHEREAS, County currently owns and operates Charlotte County Utilities ("CCU"), which provides central potable water service to customers in the unincorporated part of the County, as well as portions of DeSoto and Lee Counties; and

WHEREAS, City currently owns and operates the City of Punta Gorda Water Treatment Plant located on Washington Loop Road ("Punta Gorda Plant") and provides central potable water service to customers within the Punta Gorda utility system service area, which extends outside the City limits to include some of the unincorporated portion of the County; and

WHEREAS, it is of the highest priority that Punta Gorda and CCU provide a secure water supply to the residents of Charlotte County within their respective service areas, now and in the future, as evidenced by the citizens of Charlotte County having approved by referendum on November 5, 2002, the need to join the water utility

systems of County and City to provide an interconnect for emergency and other purposes; and

WHEREAS, the Parties believe it beneficial and of regional importance to connect CCU's water plant/system with the Punta Gorda Plant and to provide an interconnect for the transfer of water between the two systems, and intend that this Agreement provide the basis for implementation of the interconnect; and

WHEREAS, the Parties support funding assistance from the Southwest Florida Water Management District ("SWFWMD") for the interconnect.

NOW THEREFORE, in consideration of the foregoing, which shall be deemed an integral part of this Agreement and of the mutual covenants contained herein, the Parties intending to be legally bound hereby agree as follows:

1. Purpose. The Parties are committed to an interconnect between CCU's water plant/system and the Punta Gorda Plant/system for the transmission of water in either direction, and agree that the interconnect is of regional importance. The interconnect will connect CCU's water plant/system to the Punta Gorda Plant/system, with the point of connection in the vicinity of U.S. Highway 17 as identified on the map attached hereto as Exhibit "A" and incorporated herein by reference.

2. Study. The "Regional Integrated Loop Feasibility/Routing System Study" will recognize this interconnect as part of the overall regional system.

3. Ownership. County will construct, own, and operate the interconnect, including all maintenance, testing, and repairs, up to the valving on City's side of the meter assembly where the connection is made to the Punta Gorda Plant/system.

4. Operation. The Parties will enter into negotiations for the operational protocol of the interconnect.

5. Purchase of Water. The City can only sell water to the County when the Peace River/Manasota Regional Water Supply Authority is unable to meet the County's present and/or future demands. The parties acknowledge and agree however, that the City shall sell to County a sufficient amount of water to maintain the integrity of the pipeline. The price for any water used by the County shall be no higher than the lowest price charged by City to any other bulk purchaser.

6. Authorization. City hereby authorizes this interconnect within City limits and its water utility system service area.

7. Funding. The Parties agree to cooperate in obtaining SWFWMD funding for the interconnect.

8. Notices. In the event one party hereunder desires or is required to provide any notice to the other party, the party desiring or required to provide such notice shall provide it in writing, send it by certified mail, return receipt requested, postage prepaid, to the other party at the addresses listed below:

If to County: Bruce Loucks, County Administrator
18500 Murdock Circle
Port Charlotte, FL 33948

If to City: Howard Kunik, City Manager
326 West Marion Avenue
Punta Gorda, FL 33950

9. Amendment. This Agreement may be amended only by written consent of the Parties.

10. Execution. This Agreement shall be executed in duplicate and each shall be considered an original.

11. Disclaimer of Third Party Benefits. This Agreement is solely for the benefit of the Parties. No right or cause of action shall accrue upon or by reason hereof enure to or for the benefit of any third party.

12. Assignment. This Agreement shall be binding on the Parties, their representatives, successors and assigns. No party shall assign this Agreement or the rights or obligations hereof to any other person or entity without the prior written consent of the other party.

13. Indemnification. Neither party shall indemnify the other party. Each party acknowledges that its legal remedy shall be limited to filing suit against the other party to this Agreement in a court of competent jurisdiction.

14. Applicable Law/Disputes. This Agreement and the provisions contained herein shall be construed, controlled, and interpreted according to the laws of the State of Florida. Any dispute involving litigation between the Parties is subject to all provisions of Chapter 164, Florida Statutes. The Parties agree that venue for any litigation over alleged breach or non-performance shall be in Charlotte County, Florida.

15. Severability. If any part of this Agreement is found invalid or unenforceable by any court, such invalidity or unenforceability shall not affect the other parts of the Agreement, if the rights and obligations of the Parties contained herein are not materially prejudiced and if the intentions of the Parties continue to be effected.

16. Cooperation. Both parties to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions (including but not limited to pursuing any water use permit amendments) that may be necessary or appropriate to give full force and effect to the terms and to the intent of this Agreement.

17. Effective Date. This Agreement shall take effect upon filing a fully executed copy with the Clerk of the Circuit Court of Charlotte County.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date first written above for the purposes herein expressed.

CITY OF PUNTA GORDA, FLORIDA

Stephen M. Fabian, Jr., Mayor
Lawrence J. Friedman, Mayor

ATTEST:
Sue Foster, City Clerk

By: _____

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

David Levin, City Attorney

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

Thomas G. Moore, Chairman

ATTEST:
Barbara T. Scott, Clerk Of Circuit Court
and Ex-Officio Clerk to the Board of
County Commissioners

By: _____
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

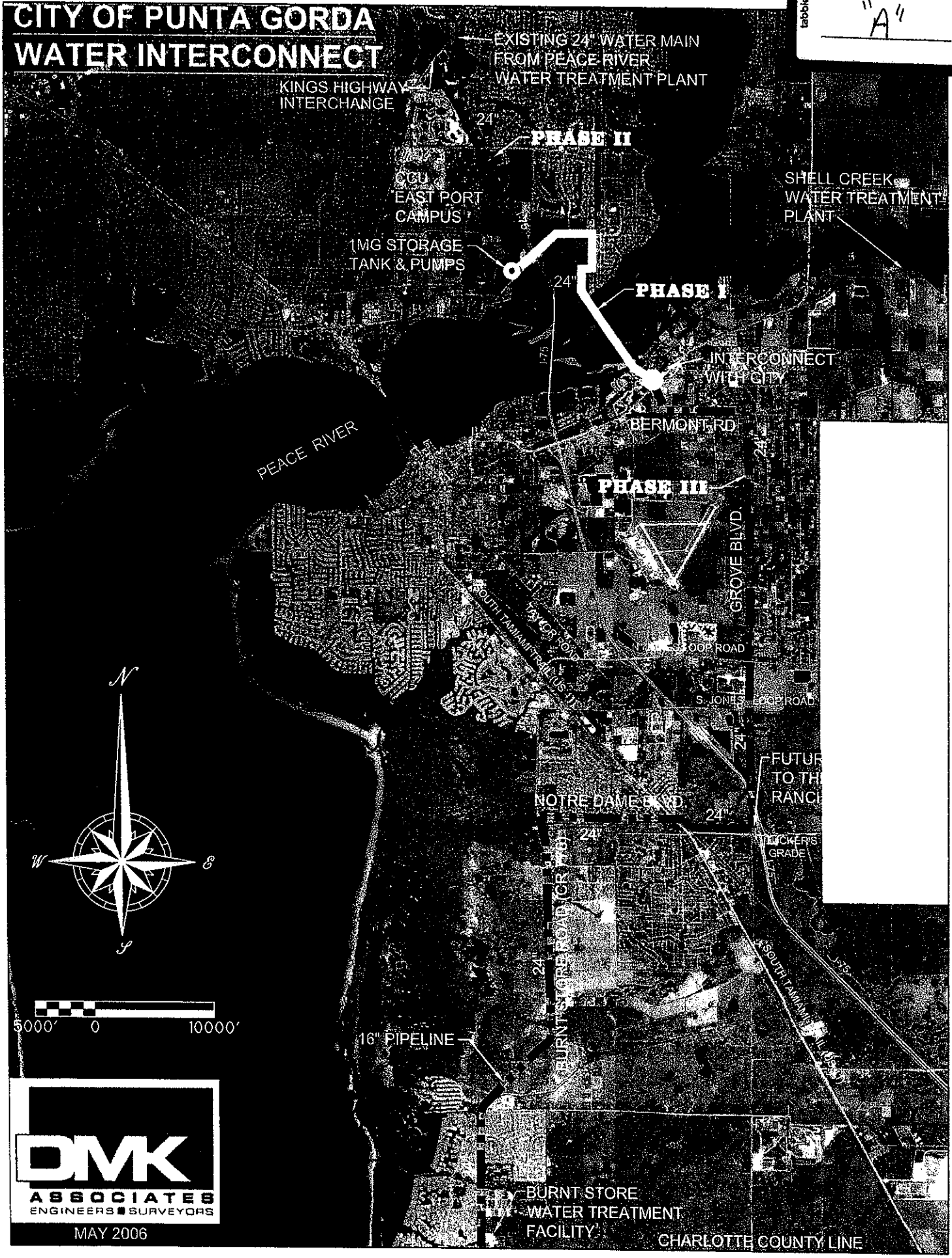
Janette S. Knowlton, County Attorney

NB

p:\wpdata\burton\agreements\puntagordacountyinterconnectFINAL.doc
LR05-313/October 24, 2006

EXHIBIT
"A"

CITY OF PUNTA GORDA
WATER INTERCONNECT



DMK ASSOCIATES
ENGINEERS ■ SURVEYORS

MAY 2006

AGREEMENT BETWEEN CHARLOTTE COUNTY AND CHWA FOR EMERGENCY SALE AND PURCHASE OF WATER

THIS AGREEMENT FOR EMERGENCY SALE AND PURCHASE OF WATER ("AGREEMENT") is made and entered into this _____ day of _____, 2011, by and between CHARLOTTE COUNTY, a political subdivision of the State of Florida, (hereinafter referred to as "COUNTY") and CHARLOTTE HARBOR WATER ASSOCIATION, INC., a Florida not-for-profit corporation (hereinafter referred to as "CHWA"), collectively referred to as the "PARTIES."

W I T N E S S E T H:

WHEREAS, COUNTY and CHWA each own and operate public water supply treatment and distribution systems which provide service to their respective customers; and

WHEREAS, the two systems are presently connected through two interconnects, one at Edgewater Drive and Vick Street and one on Mauritania Road in Deep Creek, both which are owned, metered, calibrated, and maintained by COUNTY, and used only for emergency purposes as determined by COUNTY; and [do you want to more specifically describe their locations or identify them on an attached map?]

WHEREAS, COUNTY and CHWA now wish to establish an additional mechanism for the transfer of water from one system to the other on an emergency basis, and for public purposes, as agreed upon by the PARTIES; and

WHEREAS, to that end, CHWA and COUNTY plan certain improvements that provide for an additional interconnection of the two water distribution systems so as to better permit the transfer of water from one system to the other.

NOW, THEREFORE, in consideration of the mutual covenants and premises contained herein, the PARTIES hereby agree as follows:

1. PURPOSE. The purpose of this Agreement is to provide the authorization and framework for the PARTIES to construct a new interconnect to transfer water from one water distribution system to the other, to establish certain procedures for the emergency sale and purchase of such water, and to ensure adequate protections for the two systems. CHWA shall pay for and construct a transmission main to the site of the Point-of-Connection, as shown in Exhibit A (in the vicinity of the intersection of Harborview Road and Discovery Drive or a point within the same geographic area mutually agreed upon by the PARTIES), with both PARTIES making a good faith effort, subject to permitting requirements, to begin construction within six (6) months of the date hereof and complete construction by twelve (12) months from the date hereof. [Per Jamie, this schedule is up to CHWA]

2. TERM. The term of this Agreement shall be twenty (20) years from its effective date.

3. RATE OF SUPPLY. The maximum rate of supply from the selling party shall not exceed a rate in gallons per minute that would be detrimental or harmful to the selling party's system. The rate of supply will be determined at the sole discretion of the selling party. The selling party shall not be required to sell water in excess of its Water

Use Permits, and shall not be liable to the purchasing party or its customers for any interruptions of water service provided hereunder.

4. PRICE. Water supplied by either party under this Agreement and distributed through the Point-of-Connection shall initially be charged at the highest COUNTY approved bulk water sales rate, which is subject to change from time to time, in addition to a processing fee of $25.00 per billing.

5. WATER QUALITY. Water supplied hereunder shall be of the same quality as that furnished by the selling party to its own customers, and said quality shall not be less than that required to meet the minimum requirements established by the Florida Department of Environmental Protection (FDEP), as may be amended from time to time, unless a water quality exemption has been granted by FDEP.

6. BILLING AND PAYMENT. The selling party shall bill on or around the last day of the month for all water sold hereunder during the month. Bills not paid within forty-five (45) days of receipt shall be deemed delinquent and shall be assessed a three percent (3%) per month late charge. The purchasing party shall pay all costs, including a reasonable attorney's fee, which may be incurred by the selling party in collecting any delinquent charges. The selling party, in addition to any other available remedies, after five (5) days advance notice, may terminate water service in the event the purchasing party fails to pay all or a portion of a bill for more than twenty (20) days after said bill becomes delinquent.

7. WATER METER INSTALLATION AND CALIBRATION. A bi-directional water meter, gate valves, and appurtenances of a type and design as approved by CHWA and COUNTY will be installed by CHWA at the Point-of-Connection. CHWA

shall bear the cost of the metering device(s) and gate valves and the installation of same. The meter(s) shall be jointly owned by CHWA and COUNTY. Each party shall be responsible for securing the design, permitting and construction of any water transmission mains on its respective side of the meter that may be required to transfer water through the Point-of-Connection, but all reasonable costs associated with this scope of work for COUNTY will be borne or reimbursed by CHWA.

Annual meter calibration shall be performed by a qualified third party mutually agreeable to both PARTIES, with costs split equally. For any additional testing, the requesting party shall bear the cost of such meter examinations, tests and adjustments. If a meter test discloses a deviation of more than three percent (3%), the meter shall be corrected. If either party overpaid due to such deviation, the amount of the overpayment (up to a maximum of thirty [30] days usage) will be credited to that party on the next scheduled billing, or within 60 days.

8. NOT A COMBINED SYSTEM. The purpose of this Agreement is to make emergency water supply available between the PARTIES. It is not the intent of this Agreement to form a combined water supply system that would invoke Federal Environmental Protection Agency, Southwest Florida Water Management District, or FDEP rules not otherwise applicable to the separate CHWA or COUNTY systems.

9. RENEWAL. This Agreement shall automatically be extended from year to year after the initial term, unless one party notifies the other in writing on or before the fifteenth day of January in the year in which expiration of this Agreement is desired.

10. NOTICES. In the event a party hereunder desires or is required to provide any notice to the other party, the party desiring or required to provide such notice shall

provide it in writing, and hand-deliver it to the other party at the address listed below, or send it by U.S. Certified Mail, return receipt requested, postage prepaid, to the other party at the address listed below:

If to the COUNTY: County Administrator
18500 Murdock Circle
Port Charlotte, FL 33948

If to CHWA: Paul Brayton, Manager & Corporate Secretary
Charlotte Harbor Water Association, Inc.
2515 Highland Road
Punta Gorda, FL 33983

11. AMENDMENT TO THIS AGREEMENT. This Agreement may be amended only by written consent of both PARTIES. This Agreement shall not operate to affect any rights of the parties pursuant to any existing Agreements between them or their predecessors.

12. EXECUTION. This Agreement shall be executed in duplicate, with each duplicate considered an original.

13. DISCLAIMER OF THIRD PARTY BENEFICIARIES. This Agreement is solely for the benefit of the PARTIES to this Agreement. No right or cause of action shall accrue upon or by reason hereof inure to or for the benefit of any third party.

14. ASSIGNMENT. This Agreement shall be binding on the PARTIES, their representatives, successors and assigns. Neither party shall assign this Agreement or the rights or obligations hereof to any other person or entity without the prior written consent of the other party.

15. INDEMNIFICATION. Neither party shall indemnify the other party. Each party acknowledges that its legal remedy shall be limited to filing suit against the other party to this Agreement in a court of competent jurisdiction.

16. DISPUTES. Any dispute between COUNTY and CHWA shall be submitted to mediation prior to initiation of litigation.

17. SEVERABILITY. If any part of this Agreement is found invalid or unenforceable by any court, such invalidity or unenforceability shall not affect the other parts of the Agreement, if the rights and obligations of the PARTIES contained herein are not materially prejudiced and if the intentions of the PARTIES continue to be effected.

18. APPLICABLE LAW/VENUE. This Agreement and the provisions contained herein shall be construed, controlled and interpreted according to the laws of the State of Florida. Venue shall lie in Charlotte County, Florida.

19. COOPERATION. Both PARTIES to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions (including but not limited to pursuing any water use permit amendments) that may be necessary or appropriate to give full force and effect to the terms and to the intent of this Agreement.

20. EFFECTIVE DATE. This Agreement shall take effect upon being fully executed by both Parties.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement for the purpose herein expressed.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By:_____
Robert J. Starr, Chairman

ATTEST:

Barbara T. Scott, Clerk Of Circuit
Court and Ex-Officio Clerk to the
Board of County Commissioners

By: _____
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

_____
Janette S. Knowlton, County Attorney

ATTEST:

CHARLOTTE HARBOR WATER
ASSOCIATION, INC.

By:_____
Paul Brayton, Corporate Secretary

BY: _____
Charles Cordis, President

P:\WPDATA\BURTON\Agreements\CHWA Agreement for Emergency Sale & Purchase.doc
LR 11-1497

AGR#2007-043

TRANSFER AGREEMENT

THIS TRANSFER AGREEMENT ("Agreement") is made this _____ day of _____, 2007, by and between Gasparilla Island Water Association, Inc., a Florida not-for-profit corporation, whose address is Post Office Box 310, Boca Grande, Florida 33921-0625, ("GIWA"), and Charlotte County, Florida, a political subdivision of the State of Florida, whose address is 18500 Murdock Circle, Port Charlotte, Florida 33980 ("County").

W I T N E S S E T H:

WHEREAS, GIWA and County each own and operate potable water supply, treatment, transmission and distribution systems located in the Placida area of Charlotte County, Florida; and

WHEREAS, GIWA wishes to transfer to County, and County agrees to accept the transfer of those customers in the Placida area of Charlotte County as identified in Exhibit "A", attached hereto and incorporated herein by reference; and

WHEREAS GIWA and County now wish to set forth the terms and conditions for the transfer of the Transferred System and the Transferred Area.

NOW, THEREFORE, in consideration of the foregoing, benefits to be derived from the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, GIWA and County hereby agree as follows:

1.0 RECITALS. The foregoing recitals are true and correct and are incorporated herein for all purposes.

2.0 COVENANT TO TRANSFER. The Placida customers shall be transferred in phases as follows:

2.1 Phase 1 is those Placida Customers as identified on Schedule "A" hereto. Upon execution of this Agreement, County shall immediately take action, in coordination with GIWA, to disconnect those customers from GIWA's water system and to connect them to County's water system.

2.2 Phase 2 is Gasparilla Mobile Estates and the Placida Customer as identified on Schedule "A" attached hereto. The transfer of Gasparilla Mobile Estates requires action by the membership of GIWA, which GIWA agrees to take by no later than January 31, 2008. Upon such action, County, in coordination with GIWA, shall disconnect this customer from GIWA's water system and connect it to County's water system.

2.3 Phase 3 are those Placida Customers on County road 771 (also known as "Gasparilla Road") south of the Coral Creek Bridge along the realignment of Gasparilla Road as identified on Schedule "A" attached hereto. The transfer of these Placida Customers shall occur upon the completion of the realignment of Gasparilla Road. Upon County's request, GIWA shall transfer to County for no compensation that portion of the 8-inch Asbestos Concrete main, water meters and fire hydrants that GIWA will be abandoning upon the completion of construction of GIWA's new main along the realigned Gasparilla Road. GIWA shall also assign to County the Easement from Gasparilla Diversified, Inc., to GIWA dated February 10, 1989, and recorded in Official Records Book 1026, Page 1247 of the Public Records of Charlotte County, Florida and shall transfer to County all water distribution facilities located within such Easement. All such transfers of facilities to County shall be "as is where is" without any representations or warranties.

2.4 Phase 4 is the Eldred's Marina and other properties as identified on Schedule "A" attached hereto. The transfer of these Placida Customers shall take place upon

redevelopment of the Eldred's Marina property, or ten (10) years from the date of this Agreement, whichever shall occur first.

3.0 COMPENSATION. Within thirty (30) days of execution of this Agreement by both parties, GIWA shall pay County Twenty Five Thousand Dollars ($25,000.00) to partially defray County's expenses in taking over the obligation to provide water service to the Placida Customers. No further compensation to County shall be due from GIWA, and no compensation shall be due from County to GIWA.

4.0 FIRE HYDRANTS. County shall install additional hydrants for those Placida Customers as described in Exhibit "A" as it takes over service to such Customers so that the distance between hydrants does not exceed 1,000 feet in accordance with the Charlotte County Code which shall be "deemed necessary" for the purposes of this Agreement under such wording as it appears in Section 9-1.2 of Charlotte County Code, entitled Fire Hydrant Spacing, Fire Flows, Duration of Flow.

5.0 MISCELLANEOUS PROVISIONS.

5.1 This Agreement, the Exhibits attached hereto, and the documents referred to herein collectively embody the entire agreement and understanding between the parties and there are no other agreements or understandings, oral or written, with reference to this Agreement that are not merged into and superseded by this Agreement. This Agreement may be executed in one or more counterparts, each of which shall be considered an original.

5.2 Any notice or other document required or allowed to be given pursuant to this Agreement by either party to the other shall be in writing and shall be delivered personally, or by recognized overnight courier or sent by certified mail, postage prepaid, return receipt requested, or by facsimile transmission with written confirmation. A single notice delivered to County or GIWA, as the case may be, in care of the representative designated below, or

such other representative designated by the GIWA or County from time to time, shall be sufficient notice.

If to GIWA such notice shall be addressed to GIWA at:

Gasparilla Island Water Association, Inc.
c/o Ms. Bonnie Pringle
P.O. Box 310
Boca Grande, FL 33921-0310

If to County, such notice shall be addressed to County at:

Charlotte County Utilities
c/o Director, Water Resources
25550 Harbor View Road, Unit 1
Port Charlotte, FL 33980

5.3. The headings used are for convenience only, and they shall be disregarded in the construction of this Agreement.

5.4. The drafting of this Agreement constituted a joint effort of the parties, and in the interpretation hereof it shall be assumed that no party had any more input or influence than any other. All words, terms, and conditions herein contained are to be read in concert, each with the other, and a provision contained under one heading may be considered to be equally applicable under another heading in the interpretation of this Agreement.

5.5 This Agreement is solely for the benefit of the parties hereto and no other causes of action shall accrue upon or by reason hereof to or for the benefit of any third party, who or which is not a formal party hereto

5.6 In the event any term or provision of this Agreement is determined by appropriate judicial authority to be illegal or otherwise invalid, such provision shall be given

its nearest legal meaning or be construed as deleted, as such authority determines, and the remainder of this Agreement shall be construed to be in full force and effect.

5.7 In the event of any litigation that arises between the parties with respect to this Agreement, the prevailing party shall be entitled to reasonable attorney fees and court costs at all trial and appellate levels.

5.8 This Agreement may be amended or modified only if executed in writing by the parties hereto, and if executed with the same formalities as the original Agreement.

5.9 This Agreement shall be governed by, and construed and interpreted in accordance with, the laws of the State of Florida.

5.10 County and GIWA shall, at any time and from time to time after the execution of this Agreement, upon reasonable request of the other party, execute, acknowledge and deliver, or cause to be executed, acknowledged and delivered, all such further documents, acts, deeds, assignments, transfers, powers of attorney and assurances as may be required in order to implement and perform any of the obligations, covenants and agreements of the parties pursuant to this Agreement.

IN WITNESS WHEREOF, the parties have hereunto caused this Agreement to be executed the day and year aforesaid in counterparts, each counterpart to be considered an original.

GASPARILLA ISLAND WATER
ASSOCIATION, INC.

Secretary

By: _____
Printed Name: Robert W. Caldwell, III
Title: Vice President

(SEAL)

BOARD OF COUNTY COMMISIONERS
OF CHARLOTTE COUNTY FLORIDA

By _____
Richard D. Loftus, Chairman

ATTEST:
Barbara T. Scott, Clerk of Circuit
Court and Ex-officio Clerk to the
Board of County Commissioners

By _____
Deputy Clerk 6-12-07

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

_____
Janette S. Knowlton, County Attorney

MB

P:\WPDATA\BURTON\Agreements\GIWA Transfer Agreement.doc
LR01-503 June 6, 2007

Gasparilla Island Water Asso, Inc.
Customers to transfer to CCU

Acct.	Name	Address	Meter Size	Class	
Phase 1					
758	Helen Cole	12500 Placida Road	3/4"	R	
309	Jacques Cloutier	12450 Placida Road	3/4"	R	
1633	Charles Arthur	12446 Placida Road	1"	R	
302	Joanne Allen	12440 Placida Road	3/4"	R	
303	Wayne Cole	12390 Placida Road	3/4"	R	
1173	Jerry McCall	12370 Placida Road	3/4"	R	
304	Gussie Nabers	12350 Placida Road	3/4"	R	
784	Donald Joiner	12201 Placida Road	3/4"	R	
369	Ronica Cole	12301 Placida Road	3/4"	R	
340	Patricia Cole	12301 Placida Road	3/4"	R	
321	Thomas Knight	12555 Placida Road	3/4"	R	
185	Belinda Cole	12565 Placida Road	3/4"	R	
1487	Marian Schneider	12575 Placida Road	3/4"	C	
252	Progressive-Gasp. Marina	15001 Gasp. Road	1"	C	Still has a connection with GIWA but is purchasing all water from CCU.
501	Patricia Cole	12301 Placida Road	3/4"	R	Impact fee paid, but no meter at this time.
Phase 2					
793	Earl Schworm	13000 Rte. 771	3/4"	R	
249	Gasparilla Mobile Estates	12001 Gasp Road	2"	M	
342	Gasparilla Mobile Estates	12001 Gasp Road	2"	M	
Phase 3					
1074	Gasparilla Diversified	14001 Gasp. Road	3/4"	R	
1072	Big Gallirpasa Corp	Fishery Road Houses	1"	C	
293	Gasparilla Diversified	Gallery-5 Fishery Road	3/4"	C	
1071	Fishery Restaurant	Restaurant	1.5"	C	
291	Big Gallirpasa Corp	Fishery	1.5"	C	
314	Boca Norte	12591 Placida Road	3/4"	C	
346	Boca Norte	Mercury-Wastewater Plant	3/4"	C	
225	Boca Norte-Office	12580 Placida Rd	1.5"	C	
255	Boca Norte-Boathouse	12580 Placida Rd	3/4"	C	
455	Boca Norte-Conf. Center	12580 Placida Rd	2"	C	
Phase 4					
765	Eldred's Marina	6301 BG Causeway	3/4"	C	
264	A.B.Dixon - Eledred's Marina	6301 BG Causeway	1"	C	
248	Gasp. Island Bridge Authority	6201 BG Causeway	1 1/2"	C	
1269	Kerry Keathley	6300 BG Casueway (dock)	3/4"		

Class
R - Residential
C - Commercial
M-Multi-family

SCHEDULE "A"

Attachment 3

CCUD Babcock Ranch Water Supply Technical Memorandum

JOHNSON ENGINEERING

SINCE 1946

TO: David T. Yonge, PhD, P.E.
Erik Howard, P.E.
FROM: Chris Beers, P.E.

DATE: November 16, 2022

RE: CCUD Babcock Ranch Water Supply

We have performed a cursory evaluation of the of the State of Florida owned lands of Babcock Ranch (Babcock) for public water supply for the Charlotte County Utilities Department (CCUD) at the request of Jones Edmunds and Associates and their task of preparing a utility master plan for CCUD. The goal of this evaluation was to determine the quantity of water which may be obtained from the lands as allowed as part of the "Interlocal Planning Agreement for the Babcock Ranch" (December 2005) (IPABR). The IPABR allows for (not all inclusive list):

- Wells, pipelines, and electrical utilities within State Lands of Babcock within existing roads and previously impacted areas to minimize environmental impacts
- The water must be sold and used within Charlotte County.
- Any water treatment plant would need to be constructed offsite of Babcock or specifically request permission from the Division of State Lands.

In general, the most permittable source of water from Babcock is from the Floridan aquifer system (FAS). Shallower aquifers such as the Sandstone aquifer and Mid-hawthorn aquifer may be permittable and could be blended with the FAS water, further quantitative/qualitative analysis would be needed. For simplicity, this evaluation focusses on the use of water from the Upper Floridan aquifer (UFA). In general, the UFA is most productive at the north end of Babcock and least productive in the south while the water quality degrades from the north to the south within Babcock.

The yield of water from an individual well can vary drastically within the UFA. Well yields can vary from 500 gallons per minute (gpm) to 2,500 gpm. A conceptual wellfield consisting of 36 wells was developed/modelled using three (3) progressive transmissivity values of 40,000, 60,000, and 80,000 gallons per day per foot (gpd/ft) to provide a range of results. The 36 wells represent the worst case to develop a reliable wellfield for well rotation, redundancy, and yield uncertainty. The overall footprint of the conceptual wellfield helps to minimize well interference and aquifer water level drawdown while providing a conservative approach for the infrastructure layout based on aquifer uncertainty. Figure 1 shows the conceptual wellfield layout overlayed on a wetlands map from the South Florida Water Management District's (SFWMD) geographical information system (GIS) database along with the distance between the proposed wells.

The analytical modelling shows a north Babcock wellfield matrix can safely yield 20, 24, and 32 million gallons per day (mgd) with the three (3) different transmissivities assumed and an aquifer water level drawdown of 30 feet. An allowable drawdown of 30 feet is a conservative value resulting in a lower estimation of available water from the Babcock wellfield. The aquifer has more than 400 feet of available water level drawdown being permittable, but more drawdown increases the upcoming of water from deeper within the aquifer to the wells which could be adverse. Additional site-specific data around the perimeter of the conceptual wellfield is required to better ascertain if more drawdown will cause a degradation of the water quality in the wellfield.

Upwards of 40 or 50 mgd of raw water may be developable if the aquifer characteristics were favorable and greater than 30 feet of aquifer water level drawdown occurred.

The existing CCUD test well (JE-1503) revealed:

Transmissivity of the aquifer	85,500 gpd/ft
Water Quality: Chloride concentration	600 milligrams per liter (mg/l)
Water Quality: Total dissolved solid concentration	1,500 mg/l
Water Quality: Sulfate concentration	230 mg/l

An estimated construction cost estimate was prepared for the conceptual wellfield based on the three (3) modelled scenarios of 20, 24, and 32 mgd with the corresponding transmissivities of 40,000, 60,000, and 80,000 gpm/ft, respectively. Additionally, each well was assumed to yield 0.9 mgd and therefore only the required number of wells were assumed. The raw water main was sized based on the most distant well (furthest southeast well) having a wellhead raw watermain pressure of 100 psi assuming the pressure in the raw water main at the northwest corner (intersection of SR 31 and CR74-Bermont Rd) had a pressure of 0 psi. Depending upon the location of the future water treatment plant and final well and well pump design, it may be necessary to have an inline booster pump to increase the pressure of the raw water main to minimize the size of the well pumps. Additionally, the raw water mains may need to be larger to minimize well pump horsepower and energy consumption. Tables 1 shows the cost estimates assuming the cost for the pipeline installation is $10 per foot per inch diameter.

PART 1 - Potable Water System				Wellfield Planned Capacity					
Potable Raw Water Supply				20 MGD		24 MGD		32 MGD	
Item #	Item Description	Unit	Unit Cost	Est. Qty.	Total Est. Price	Est. Qty.	Total Est. Price	Est. Qty.	Total Est. Price
a	UFA Wells & Appurtenances	EA	$1M	23	$23,000,000	27	$27,000,000	36	$36,000,000
b	8" Raw Water Pipeline	LF	$80	9,609	$768,720	9,609	$768,720	0	$0
c	10" Raw Water Pipeline	LF	$100	9,383	$938,300	9,383	$938,300	9,609	$960,900
d	12" Raw Water Pipeline	LF	$120	21,502	$2,580,240	11,796	$1,415,520	9,383	$1,125,960
e	14" Raw Water Pipeline	LF	$140	19,138	$2,679,320	19,393	$2,715,020	11,796	$1,651,440
f	16" Raw Water Pipeline	LF	$160	16,189	$2,590,240	18,143	$2,902,880	19,393	$3,102,880
g	18" Raw Water Pipeline	LF	$180	14,574	$2,623,320	13,449	$2,420,820	18,143	$3,265,740
h	20" Raw Water Pipeline	LF	$200	2,676	$535,200	11,298	$2,259,600	13,449	$2,689,800
i	24" Raw Water Pipeline	LF	$240	16,625	$3,990,000	3,483	$835,920	11,298	$2,711,520
j	30" Raw Water Pipeline	LF	$300	4,134	$1,240,200	13,142	$3,942,600	16,625	$4,987,500
k	36" Raw Water Pipeline	LF	$360	0	$0	4,134	$1,488,240	4,134	$1,488,240
l	Electrical	LF	$40	113,830	$4,553,200	113,830	$4,553,200	113,830	$4,553,200
	PART 1 SUB-TOTAL				**$45,498,740**		**$51,240,820**		**$62,537,180**
	25% Contingency Fee:				**$11,374,685**		**$12,810,205**		**$15,634,295**
	TOTAL ESTIMATED PRICE				**$56,873,425**		**$64,051,025**		**$78,171,475**
				20 MGD		**24 MGD**		**32 MGD**	

Table 1. Conceptual Wellfield Cost Estimate

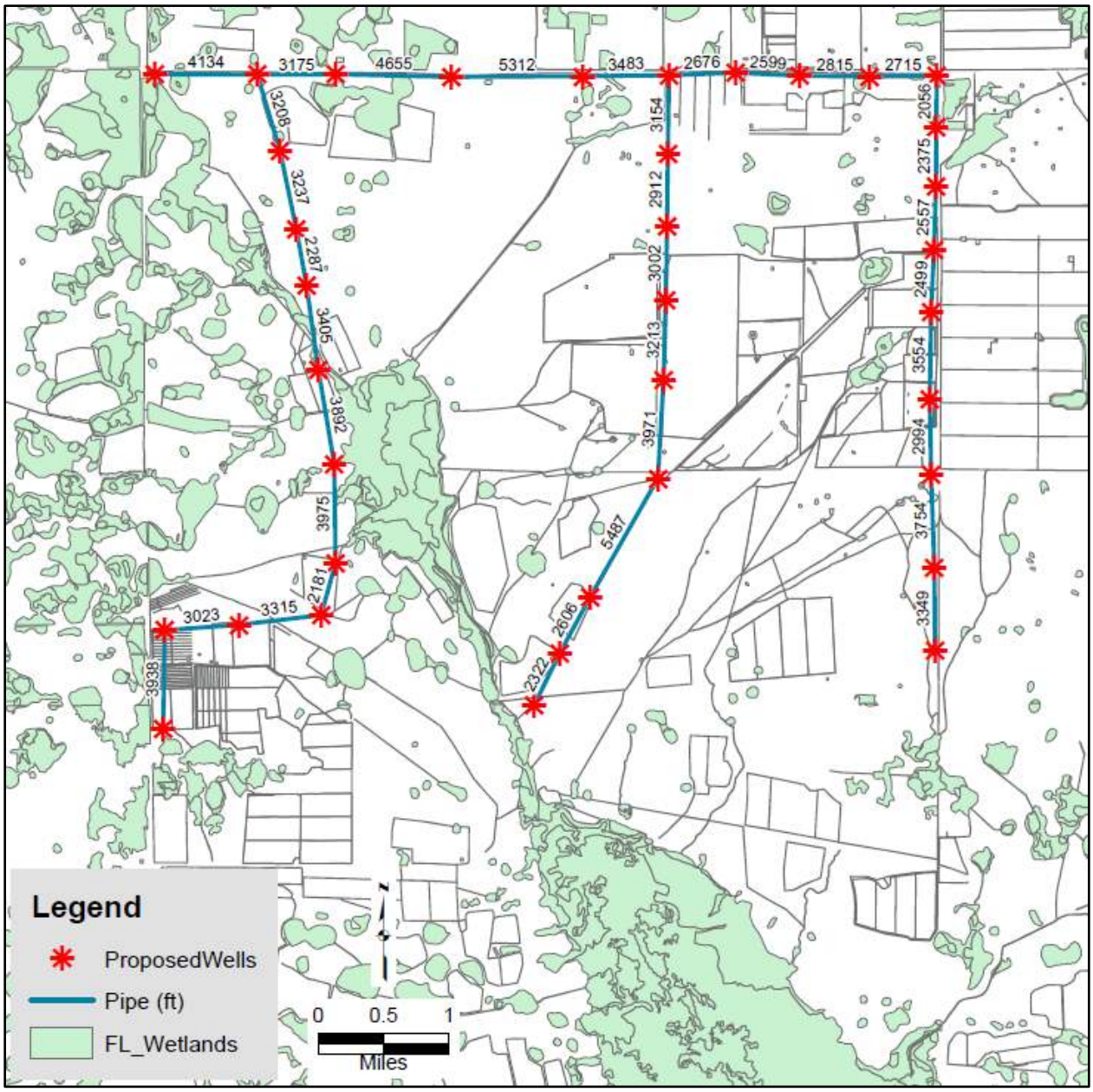


Figure 1. Conceptual Wellfield Map

Please see attached appendix ***Babcock Ranch Wellfield Planning-Level Water Supply Feasibility Study*** for detailed hydro-modeling results.

RMA
GeoLogic Consultants, Inc.

RMA GeoLogic Consultants, Inc.
3401 SE 15th Place, Suite A Cape Coral, FL 33904
(239) 415-1818 | Fax: (239) 415-1919
www.rma-geologic.com | e-mail: info@rma-geologic.com

TECHNICAL MEMORANDUM

BABCOCK RANCH WELLFIELD PLANNING-LEVEL WATER SUPPLY FEASIBILITY STUDY

I. INTRODUCTION

The Charlotte County Utilities Department (CCUD) Public Water Supply (PWS) Babcock Ranch Wellfield is located in eastern Charlotte County, Florida (Figure 1). The wellfield is included in South Florida Water Management District (SFWMD) water use permit (WUP) number 08-00129-W (Appendix A). This permit provides for annual and maximum monthly allocations of 372 and 93 million gallons (MG), respectively. This is equivalent to an annual average of 1.02 million gallons per day (MGD) and a peak month of 3.10 MGD.

The Babcock Ranch Wellfield is currently permitted as a backup source of water for the two CCUD PWS service areas. Those are the West/Central Charlotte County Service Area which is identified in the Southwest Florida Water Management District (SWFWMD) water use permit number 7104.006 and the Burnt Store water treatment plant (WTP) service area identified in the SWFWMD water use permit number 3522.012. The locations of those two PWS service areas are shown on Figure 2.

The source of raw water for the Babcock Ranch wellfield is an Upper Floridan Aquifer (UFA) wellfield. The currently permitted UFA wellfield is comprised of three proposed production wells (Figure 2). In addition, one UFA monitoring well and one Sandstone aquifer monitoring well are included in the water use permit for the Babcock Ranch wellfield. A summary of the well construction details for the permitted production wells and the existing monitoring wells is provided in Table 1.

This planning-level hydrogeological feasibility study includes a review of the existing hydrogeologic data pertinent to the UFA in the Babcock Ranch wellfield area, develop an analytical groundwater flow model to simulate different withdrawal scenarios to determine safe yield and number of production wells from the UFA without causing impact to on-site water resources and nearby permitted users, evaluate the quality for the UFA groundwater to be used for the treatment options, and prepare a brief report to summarize the findings with applicable conclusions and recommendations. The purpose of the study is to provide preliminary guidance for the expansion of the Babcock Ranch wellfield as an alternative viable water supply to the water delivered by the Peace River Manasota Regional Water Supply Authority (PRMRWSA) and expansion program.

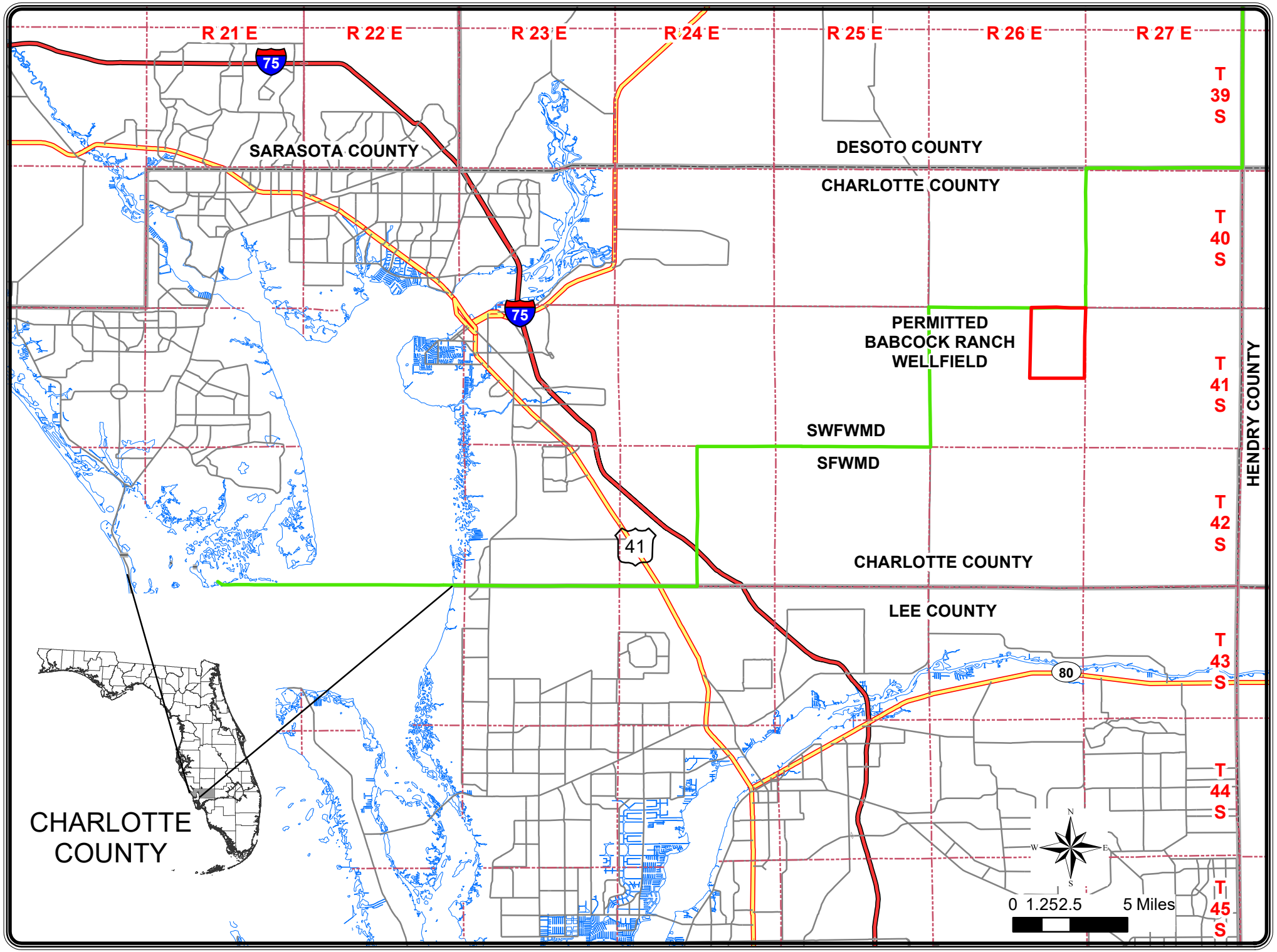


FIGURE 1- GENERAL SITE LOCATION MAP FOR THE CCUD BABCOCK RANCH WELLFIELD.

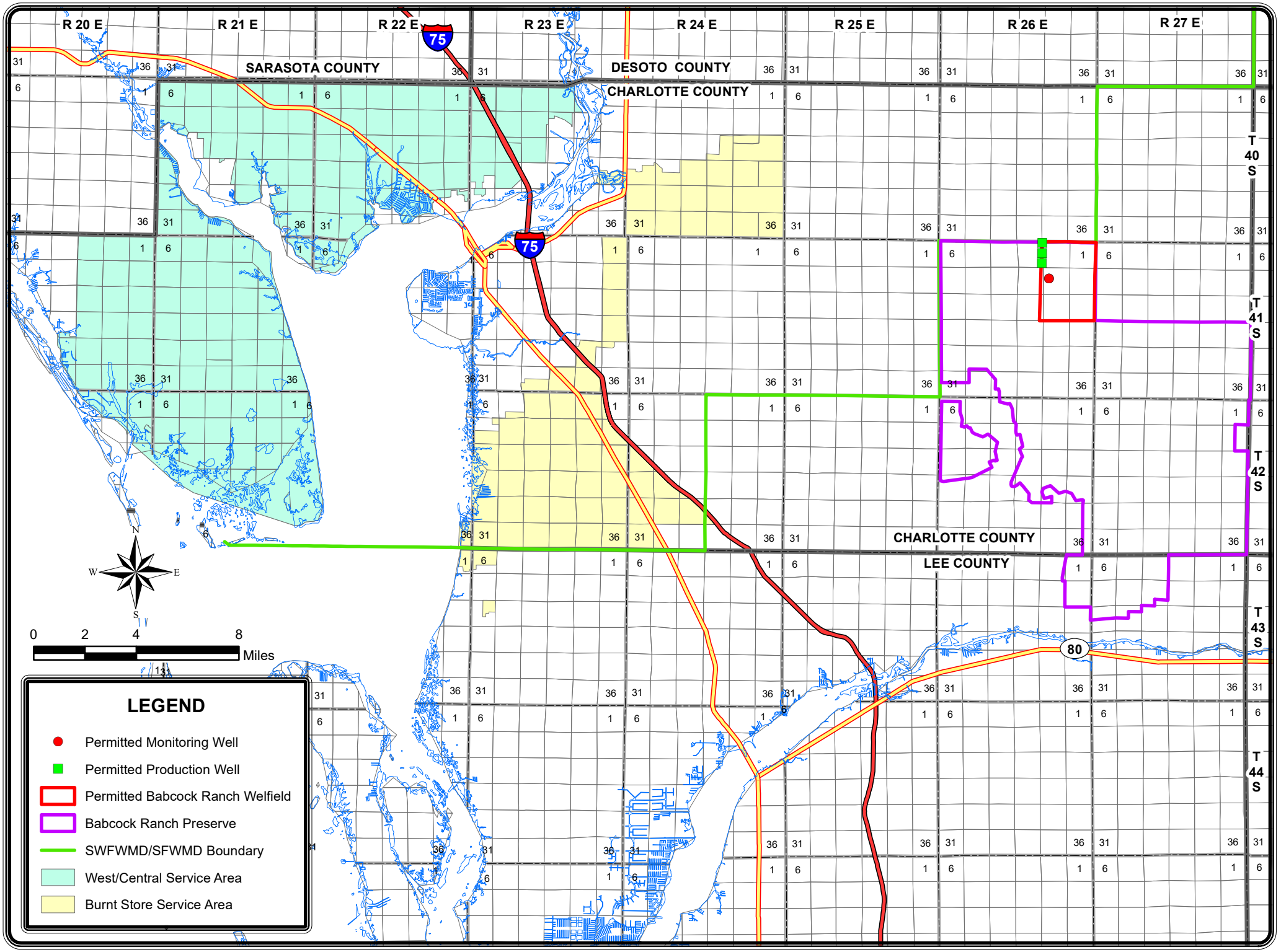


FIGURE 2- MAP SHOWING CCUD SERVICE AREAS, THE PERMITTED BABCOCK RANCH WELLFIELD, AND BABCOCK RANCH PRESERVE AREA.

TABLE 1
SUMMARY OF PERTINENT DETAILS FOR PERMITTED BABCOCK RANCH WELLFIELD FACILITIES.

Well #	Other Well #	FL Planar X83	FL Planar Y83	Well Depth (feet)	Casing Depth (feet)	Well Diameter (in)	Aquifer	Well Status	Well Use
PW-1		425590	949811	900	660	14	UFA	Proposed	PWS
PW-2		429545	947662	900	660	14	UFA	Proposed	PWS
PW-3		429488	945666	900	660	14	UFA	Proposed	PWS
JE-1503	FAS-MW-1	430925	942450	1200	470	6	UFA	Existing	Monitoring
JE-1501	IAS-MW-1	430950	942480	240	62	4	Sandstone	Existing	Monitoring

UFA = Upper Floridan Aquifer
PWS - Public Water Supply

II. UPPER FLORIDAN AQUIFER HYDROGEOLOGY FOR THE BABCOCK RANCH WELLFIELD AREA

A. Hydrostratigraphy

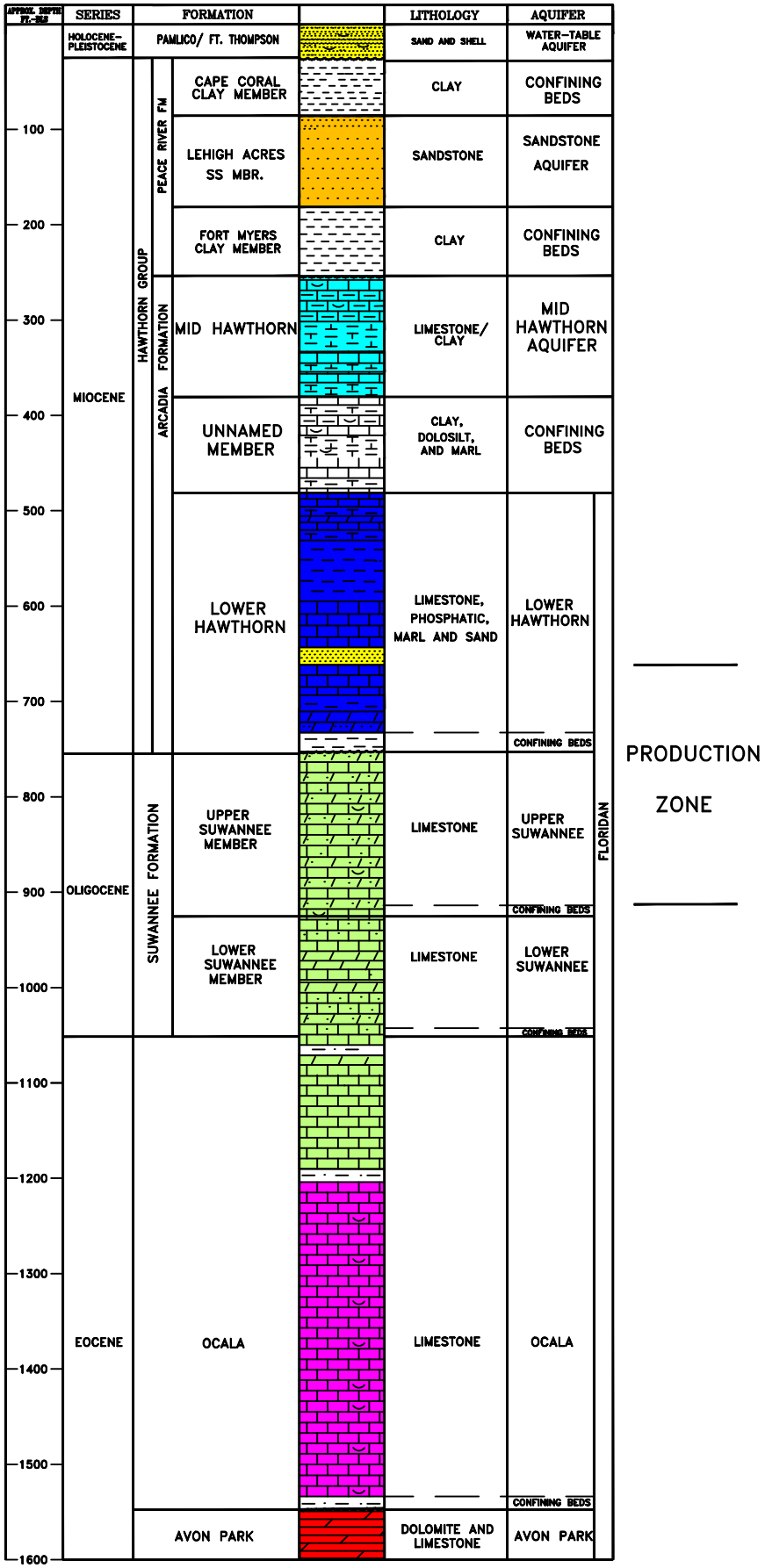
The hydrostratigraphy of the Babcock Ranch wellfield area has been detailed in several publications and reports (Arthur et.al., 2008; Johnson Engineering, 2011; RMA GeoLogic Consultants, 2015; and SWFWMD, 1997). Due to the importance for the groundwater resources and the permitted supply aquifer (i.e. Upper Floridan aquifer) for the Babcock Ranch wellfield, a brief description of the hydrogeology from the Arcadia formation to the Avon Park formation is provided herein. A generalized hydrostratigraphic column for the Babcock Ranch wellfield area is provided as Figure 3.

The Arcadia formation contains two major producing units: (1) the Mid Hawthorn aquifer (MHA) referred to as the Middle Intermediate aquifer (MIA) by the SWFWMD and (2) the Lower Hawthorn aquifer (LHA) referred as the Lower Intermediate aquifer (LIA) by the SWFWMD. The MHA is the shallowest limestone units encountered in the Arcadia formation and it is not a single continuous unit throughout the area, but instead multiple producing intervals separated by confining units. The production zones in the MHA are typically thin marly limestone units of limited areal extent with low yields in eastern Charlotte County.

The LHA is considered part of the Upper Floridan aquifer (UFA) by the SFWMD and as part of the Intermediate aquifer system by the SWFWMD. The LHA can be subdivided into an upper unnamed highly phosphatic limestone and a lower much less phosphatic limestone commonly referred to as the Tampa Limestone. The overall thickness of the LHA is about 300 feet in western Charlotte County and less than 200 feet in the Babcock Ranch wellfield area (Figure 4). The LHA thins and interbedded clays become a greater percentage of the total unit thicknesses to the east. The LHA is a continuous aquifer throughout the study area typically under artesian pressure in western Charlotte County and non-artesian in the Babcock Ranch wellfield area, as demonstrated with the historical monitoring data for the CCUD Babcock Ranch monitoring well (test well JE-1503) provided in a subsequent portion of this TM.

The Suwannee formation part of the UFA underlies the LHA and is typically a non-phosphatic, calcarenitic limestone. The overall thickness of the Suwannee formation in Charlotte County is about 400 feet and approximately 300 feet in the Babcock Ranch wellfield area (Figure 5). Due to its greater depth and, in many areas, vertical proximity to the base of the Underground Source of Drinking Water (USDW) in the western part of Charlotte County (Figure 6), defined by regulation as 10,000 milligrams per liter (mg/l) total dissolved solids (TDS), the Suwannee is not typically used as an RO feedwater source in the western part of the County but it is a viable source of supply in portions of the eastern part of Charlotte County and specifically the Babcock Ranch wellfield area, as demonstrated by the on-site testing program (Johnson Engineering, 2011).

GENERAL HYDROSTRATIGRAPHIC COLUMN FOR BABCOCK RANCH AREA



RMA GeoLogic Consultants, Inc.	PROJECT NAME: BABCOCK RANCH WELLFIELD
	PROJECT NUMBER: 22-373 DATE: 10/21/22

FIGURE 3– GENERALIZED HYDROSTRATIGRAPHIC COLUMN FOR THE BABCOCK RANCH AREA.

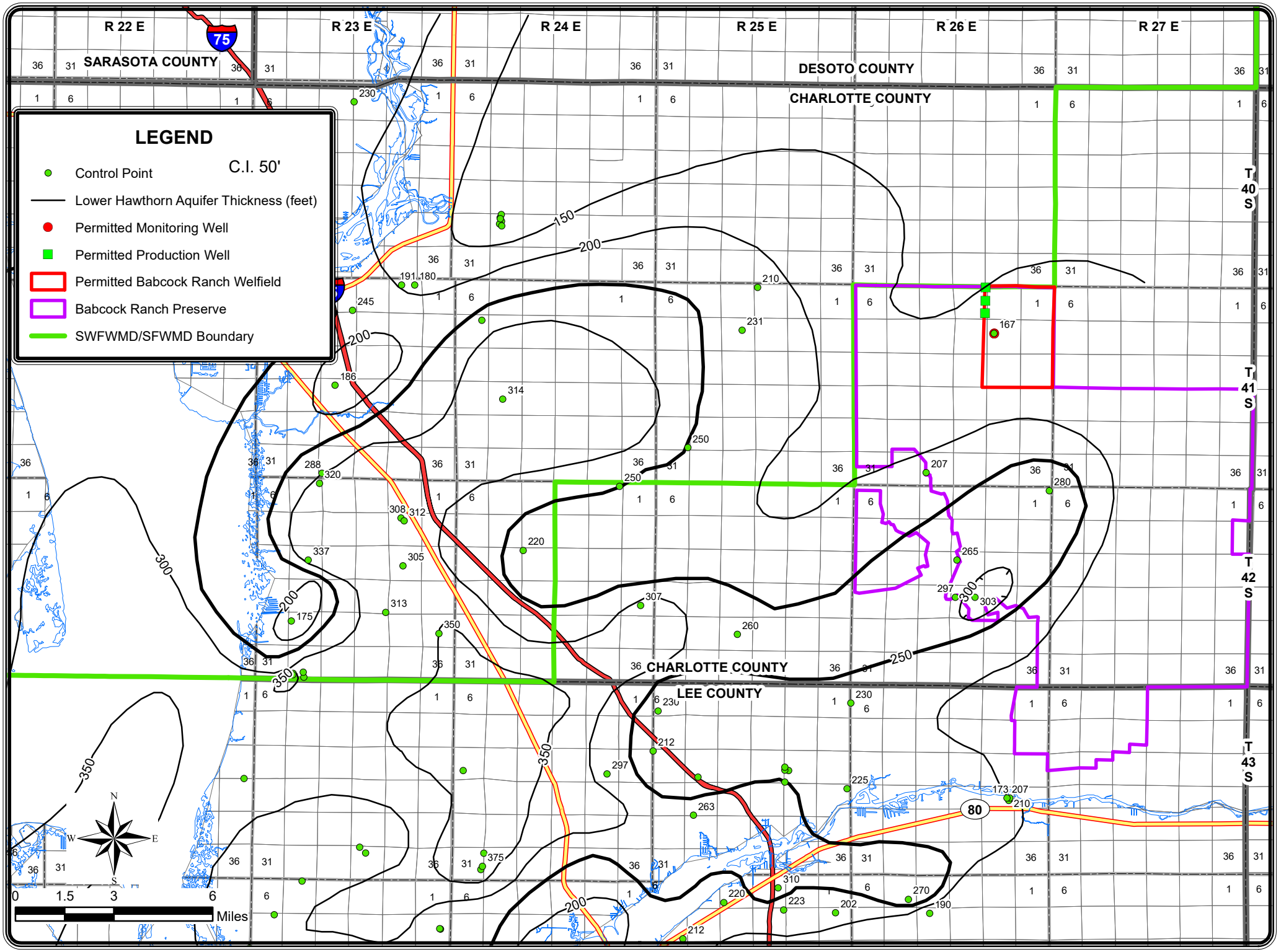


FIGURE 4- GROSS THICKNESS CONTOUR MAP FOR THE LOWER HAWTHORN AQUIFER.

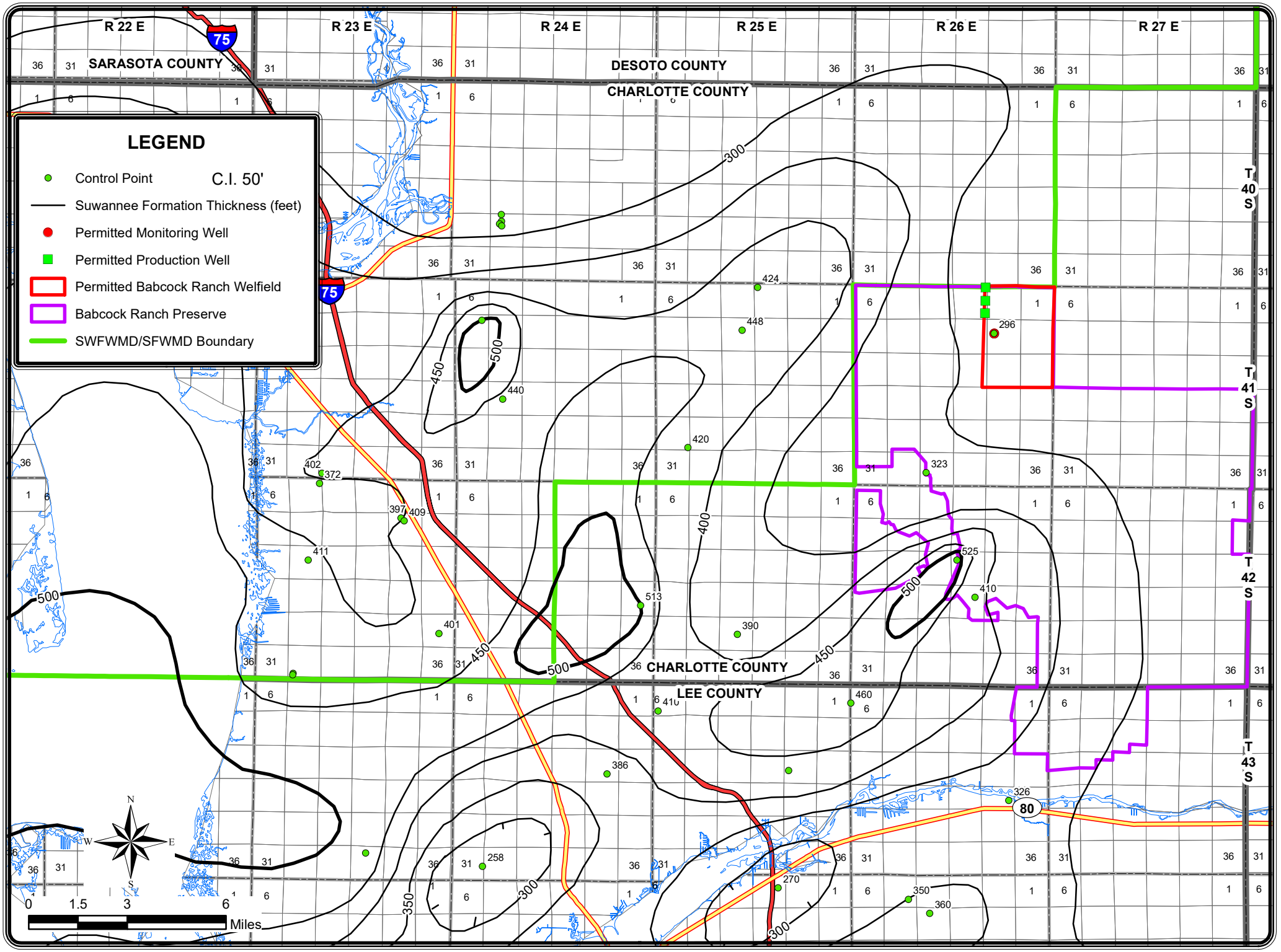


FIGURE 5- GROSS THICKNESS CONTOUR MAP FOR SUWANNEE LIMESTONE PORTION OF THE UPPER FLORIDAN AQUIFER.

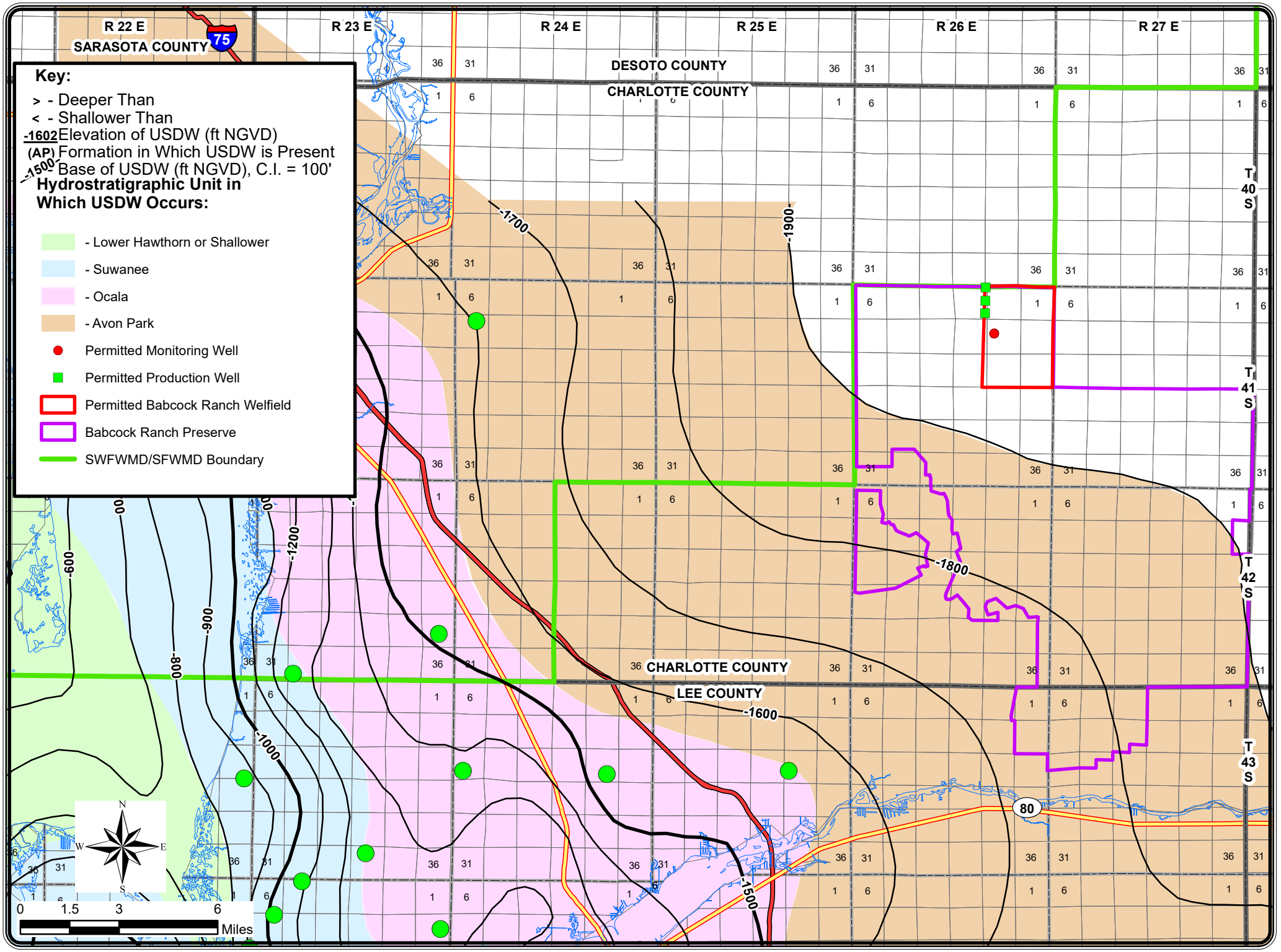


FIGURE 6- MAP SHOWING DEPTH (IN FEET NGVD) TO BASE OF USDW AND AQUIFER IN WHICH USDW OCCURS (PREDEVELOPMENT).

B. Water Levels for the UFA in the Babcock Ranch Wellfield Area

Based on the historic water level data collected from CCUD Babcock Ranch Wellfield monitoring well JE-1503 (well location shown on Figure 2), water levels in the UFA can vary in an average year approximately 4 feet from the wet to the dry season (Figure 7). The maximum and minimum water level elevations recorded in that well, over an approximate 10-year period of record, are 51.0 and 44.5 feet NGVD, respectively. The water levels are not artesian with a range of 4 to 10 feet below land surface (BLS). The peak minimum dry season water level was used for the analytical groundwater flow modeling simulations provided in a subsequent portion of this TM.

C. Water Quality for the UFA in the Babcock Ranch Wellfield Area

The water quality in the LHA and Upper Suwannee portions of the UFA in the Babcock Ranch wellfield area is slightly brackish with dissolved chloride concentrations ranging from 400 to 700 mg/l. Maps showing dissolved chloride concentrations for the LHA and the Suwannee formation portion of the UFA are provided as Figures 8 and 9, respectively.

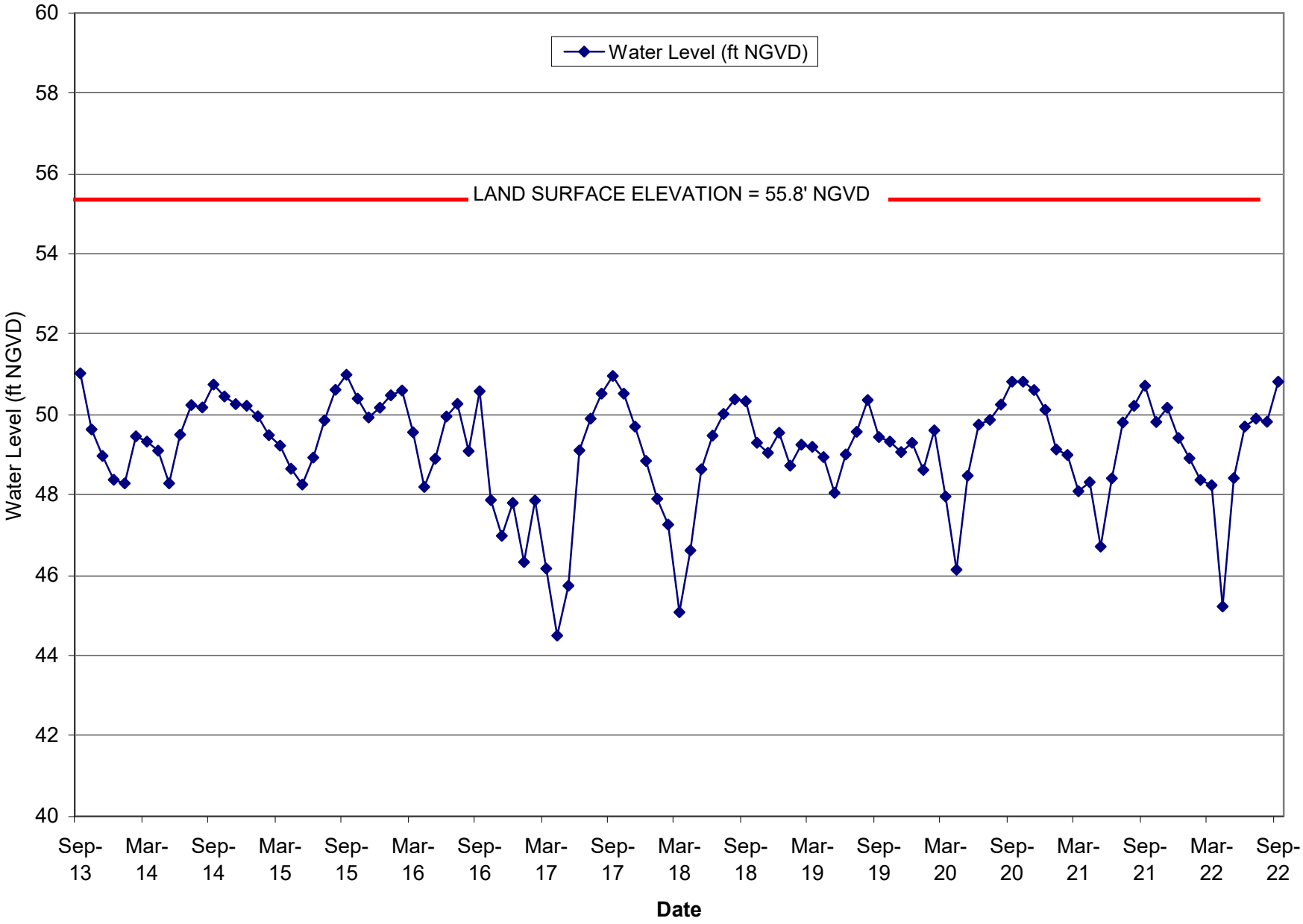
A water quality profile for the UFA to 1,200 feet BLS into the Ocala formation was prepared as part of the Babcock Ranch wellfield test well drilling program (Johnson Engineering, 2011). The water quality testing of the UFA indicated good water quality for the tested interval including the Ocala formation which has a relatively low permeability and is considered a semi-confining unit. Therefore, there is a low risk for upconing of more saline water from the Avon Park formation if no extensive drawdowns are caused in the producing aquifer. The Avon Park formation is the first producing interval anticipated to contain groundwater with high salinity and where the base of the USDW occurs in the area, as shown on Figure 6. The water quality profiles for test well JE-1503 are provided as Figures 10 and 11.

Test well JE-1503 is used for the water quality monitoring required for the CCUD Babcock Ranch wellfield water use permit. The monthly water quality data collected indicate chloride concentrations ranging from 500 to 700 mg/l. A plot of the historical chloride concentrations for well JE-1503 is provided as Figure 12.

D. Aquifer Parameters for the UFA in the Babcock Ranch Wellfield Area

A summary of the published aquifer parameter data for the UFA in the general area of the Babcock Ranch is provided in Table 2. The transmissivity values for the UFA range from about 20,000 to more than 200,000 gpd/ft with a typical decreasing trend towards the east where the aquifer thins and is more clastic. Transmissivity is an indication of aquifer productivity and is a measure of the amount of water that can be transmitted horizontally through a unit width of the aquifer under a hydraulic gradient of 1.

FIGURE 7- PLOT OF WATER LEVEL ELEVATIONS FOR BABCOCK RANCH WELLFIELD MONITORING WELL JE-1503.



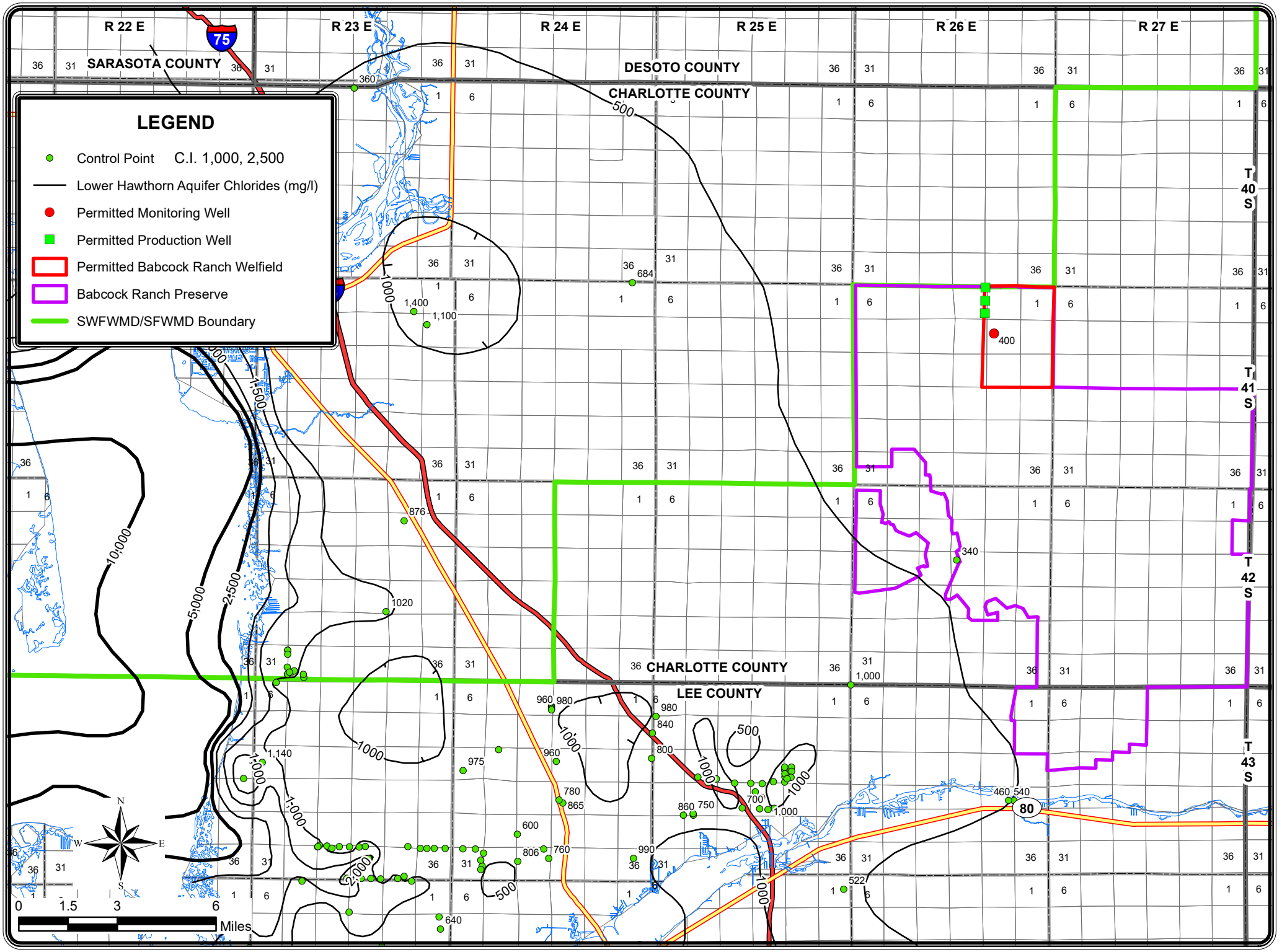


FIGURE 8- DISSOLVED CHLORIDE CONTOUR MAP FOR THE LOWER HAWTHORN AQUIFER.

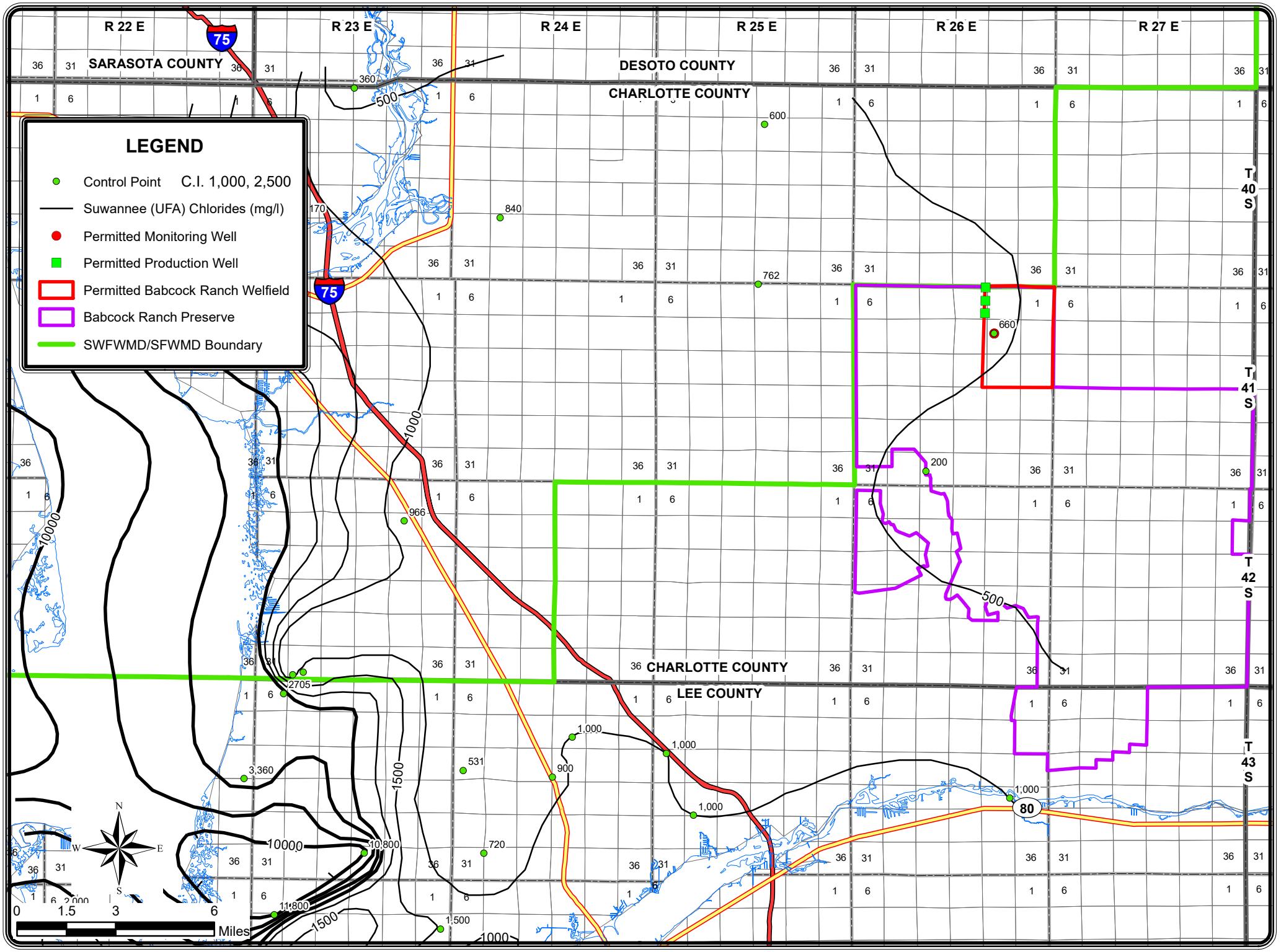


FIGURE 9- DISSOLVED CHLORIDE CONTOUR MAP FOR SUWANNEE LIMESTONE PORTION OF THE UPPER FLORIDAN AQUIFER.

FIGURE 10

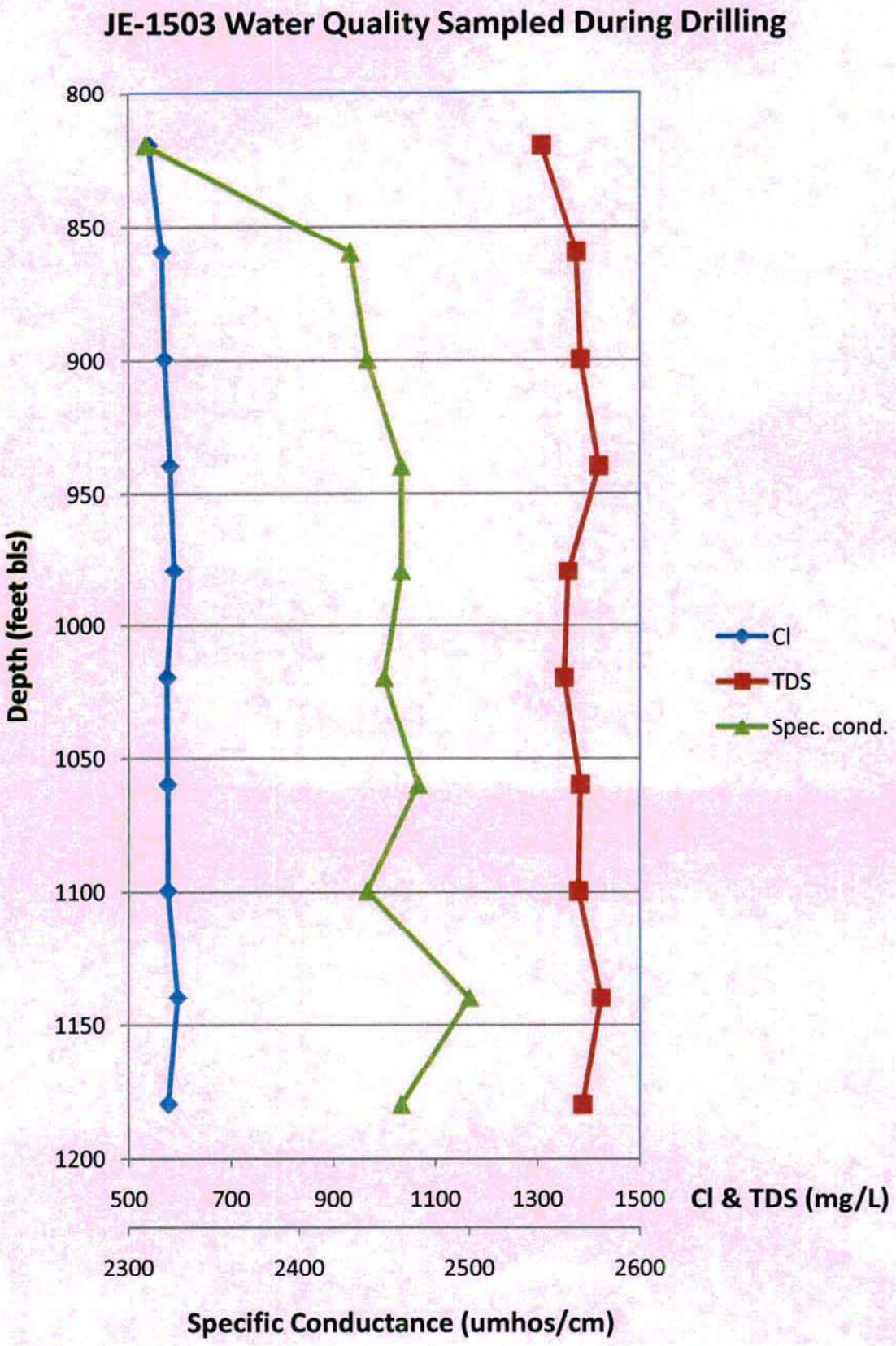


FIGURE 11

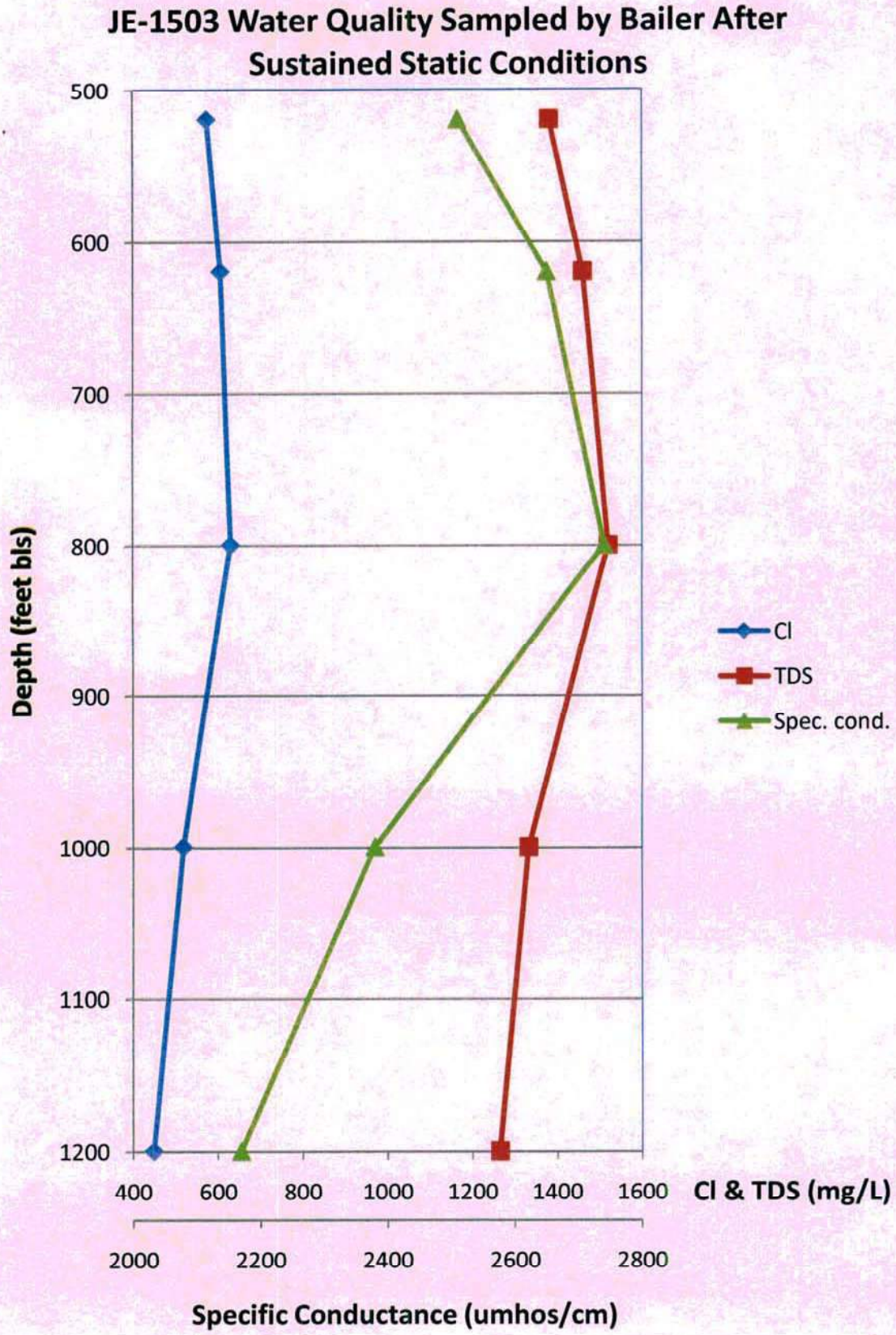


FIGURE 12- PLOT OF CHLORIDE CONCENTRATIONS FOR BABCOCK RANCH WELLFIELD MONITORING WELL JE-1503.

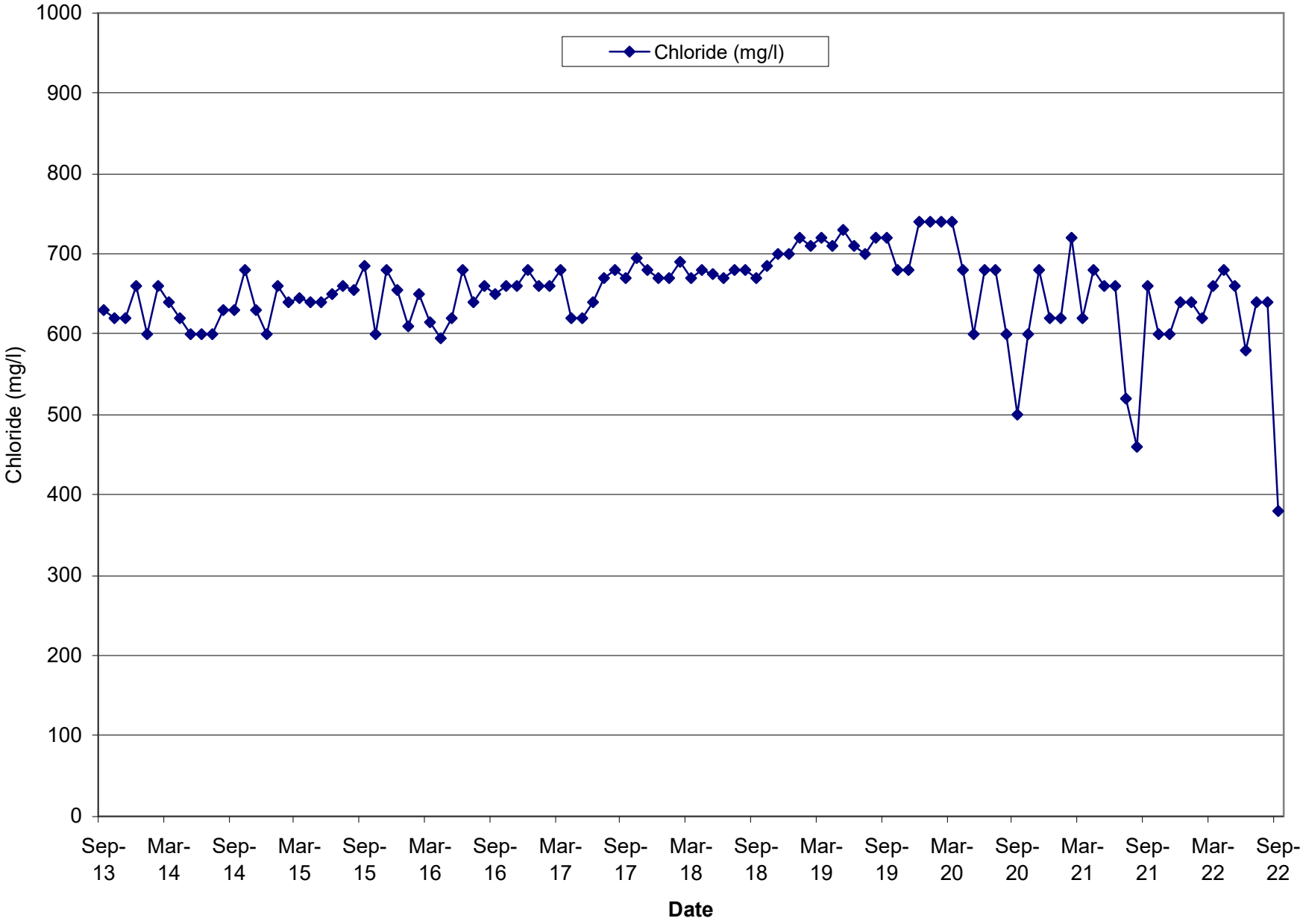


TABLE 2- SUMMARY OF AQUIFER PARAMETER DATA FOR THE UPPER FLORIDAN AQUIFER IN THE BABCOCK RANCH GENERAL AREA.

Well Numer	Other Number	Location (QTR QTR S-T-R)	Test Interval	Aquifer	Transm-issivity (gpd/ft)	Storage Coefficient	Leakance (gpd/ft^3)	Test Type	Comments	Data Source
Charlotte Grove	WUP 9398	10-40S-25E	604 - 840	UF(SU)	38,000	2.30E-03		Unknown	Charlotte Grove WUP, Kv = 0.0025 ft/d	SWFWMD
Charlotte Grove	WUP 9398	10-40S-25E	294 - 440	LHA	114,000	3.73E-04	3.22E-02	APT	Charlotte Grove WUP	SWFWMD
P-2		17-40S-26E	300 - 664	LHA	50,500			Step	Jones Potato Farms	SWFWMD
Tropical River		27-40S-26E	Unknown	LHA	23,000	1.00E-04	8.98E-04	Unknown	Tropical River Groves	SWFWMD
CH-477	MW-4	NE NW 03-41S-25E	720 - 970	UF(SU)	19,500	4.08E-01	1.50E-02	Unknown	ROMP 5 Cecil Webb	SWFWMD
CH-573	MW-3	NE NW 03-41S-25E	450 - 600	LHA	22,200			Unknown	ROMP 5 Cecil Webb	SWFWMD
ROMP 5 Combined		NE NW 03-41S-25E	450 - 970	LHA/UF(SU)	41,700		1.50E-02	Unknown	ROMP 5 Cecil Webb	SWFWMD
JE-1503	WUP 08-00129-W	SW NW 10-41S-26E	470 - 1200	LHA/UF(SU/OC)	85,500	1.10E-03	7.10E-04	APT	Babcock Ranch WF	Johnson Eng., 2011
JE-903	WUP 08-00122-W	SW SW 33-41S-26E	566 - 942	LHA/UF(SU)	28,000	1.35E-03	1.18E-01	APT	Town & Country Utilities	Johnson Eng., 2007
JE-901	WUP 08-00122-W	NW NW 16-42S-26E	497 - 620	LHA	80,800	1.56E-04	1.57E-03	APT	Town & Country Utilities	Johnson Eng., 2007
TW-9		NE NW 09-43S-25E	550 - 786	LHA	78,500	1.05E-04	1.00E-02	APT	North Lee County, pumping from TW-9	RMA, 2020
PW-7		NW SW 14-43S-25E	478 - 776	LHA	72,000	8.84E-04	8.81E-03	APT	North Lee County, pumping from PW-7	MWH, 2004
PW-8		SW SW 14-43S-25E	451 - 653	LHA	163,000	2.25E-04	8.00E-03	APT	North Lee County, pumping from PW-8	MWH, 2004
PW-9		NE NW 22-43S-25E	541 - 747	LHA	111,500	2.28E-04	8.29E-03	APT	North Lee County, pumping from PW-9	RMA, 2009
PW-11		NW NW 22-43S-25E	538 - 748	LHA	167,500	4.64E-04	2.09E-02	APT	North Lee County, pumping from PW-11	RMA, 2011
MW-3	OW-1, LM-6208	SE SW 20-43S-25E	537 - 615	LHA	63,700	3.96E-04	5.48E-03	APT	North Reservoir ASR	RMA, 2019
MW-3	OW-1, LM-6208	SE SW 20-43S-25E	904 - 977	UF(SU)	71,700			Packer	North Reservoir ASR	RMA, 2019
PW-14		SE SW 17-43S-25E	597 - 803	LHA	229,000	1.31E-04	3.04E-03	APT	North Lee County, pumping from PW-14	RMA, 2012
TW-8		SW SE 09-43S-26E	493 - 694	LHA	106,000	1.86E-04	1.62E-02	APT	North Lee County, pumping from TW-8	RMA, 2020
ASR-1		NE SE 23-43S-26E	850 - 895	UF(SU)	73,700	1.46E-04	1.85E-01	APT	LCU-Olga ASR, pumping from ASR-1	RMA, 2020
ASR-5		NE SE 23-43S-26E	850 - 895	UF(SU)	71,200	1.69E-04	3.03E-03	APT	LCU-Olga ASR, pumping from ASR-5	RMA, 2020.
				Minimum:	19,500	1.00E-04	7.10E-04			
				Average:	81,476	2.45E-02	2.66E-02			
				Maximum:	229,000	4.08E-01	1.85E-01			
				Model Parameters:						
				Minimum:	40,000	8.00E-04	8.00E-04			
				Average:	60,000	8.00E-04	8.00E-04			
				Maximum:	80,000	8.00E-04	8.00E-04			

The published aquifer parameter data for the Babcock wellfield and immediate area was used to establish the parameters used for the analytical model simulations. The transmissivity values for the three aquifer performance tests conducted in the northwest area of the Babcock Preserve which is considered the most feasible area for an UFA wellfield range from 28,000 gpd/ft for 85,000 gpd/ft. Consequently, minimum and maximum transmissivity values of 40,000 and 80,000 gpd/ft were used for the model simulations, as shown in Table 2. A conservative transmissivity average of 60,000 gpd/ft was used for the simulations.

III. ANALYTICAL GROUNDWATER FLOW MODELING

Consistent with the guidelines of the SFWMD Applicant's Handbook for Water Use Permit Applications, Section 3.1.2 (A), analytical groundwater flow simulations using Winflow were conducted iteratively. Three main Scenarios of the model, as described below, were conducted. The WinFlow (Environmental Solutions, 2004) analytical groundwater flow model was used to determine the drawdown of withdrawing different volumes from a potential CCUD UFA wellfield for ninety days with no recharge to the system. As previously indicated, the most feasible area for the development of an UFA wellfield is the northwest portion of the Babcock Preserve. A total of 36 production wells with an interwell spacing of at least 2,500 feet were sited in the northwest portion of the Babcock Ranch preserve (Figure 13) along preliminary potential alignments. It should be noted that typical interwell spacing for UFA wellfields are approximately 1,500 feet. Therefore, more production wells may be constructed within that area. The purpose of the model simulations was to conservatively determine the safe yield for the UFA in the Babcock Ranch area for planning purposes rather than precisely siting well locations or wellfield alignments. The analytical model was run using the transient module which integrates equations developed by Hantush and Jacob (1955) for leaky confined aquifers.

The aquifer parameters used for the three scenarios used in the analytical model simulations are provided in Table 2. The scenarios were conducted iteratively until the maximum drawdown in the UFA was less than 30 feet. The maximum drawdown of 30 feet was selected conservatively using dry season water levels of ten feet BLS, typical pump intake setting depths, friction losses, and other safety factors. Additionally, that minimizes water quality deterioration due to upconing and reduces permittability issues with the SFWMD. A description of the three main scenarios with the corresponding results are provided below.

Scenario 1: Scenario 1 was using the conservative average transmissivity of 60,000 gpd/ft and an initial withdrawal rate of 1.0 million gallon per day (MGD) from each production well for a total wellfield withdrawal of 36.0 MGD. This resulted in a maximum drawdown in the UFA of 45.6 feet. The withdrawal rates from each production well were reduced until the maximum drawdown in the UFA was approximately 30 feet. The drawdown of 30 feet was obtained with a withdrawal rate of 0.7 MGD from each

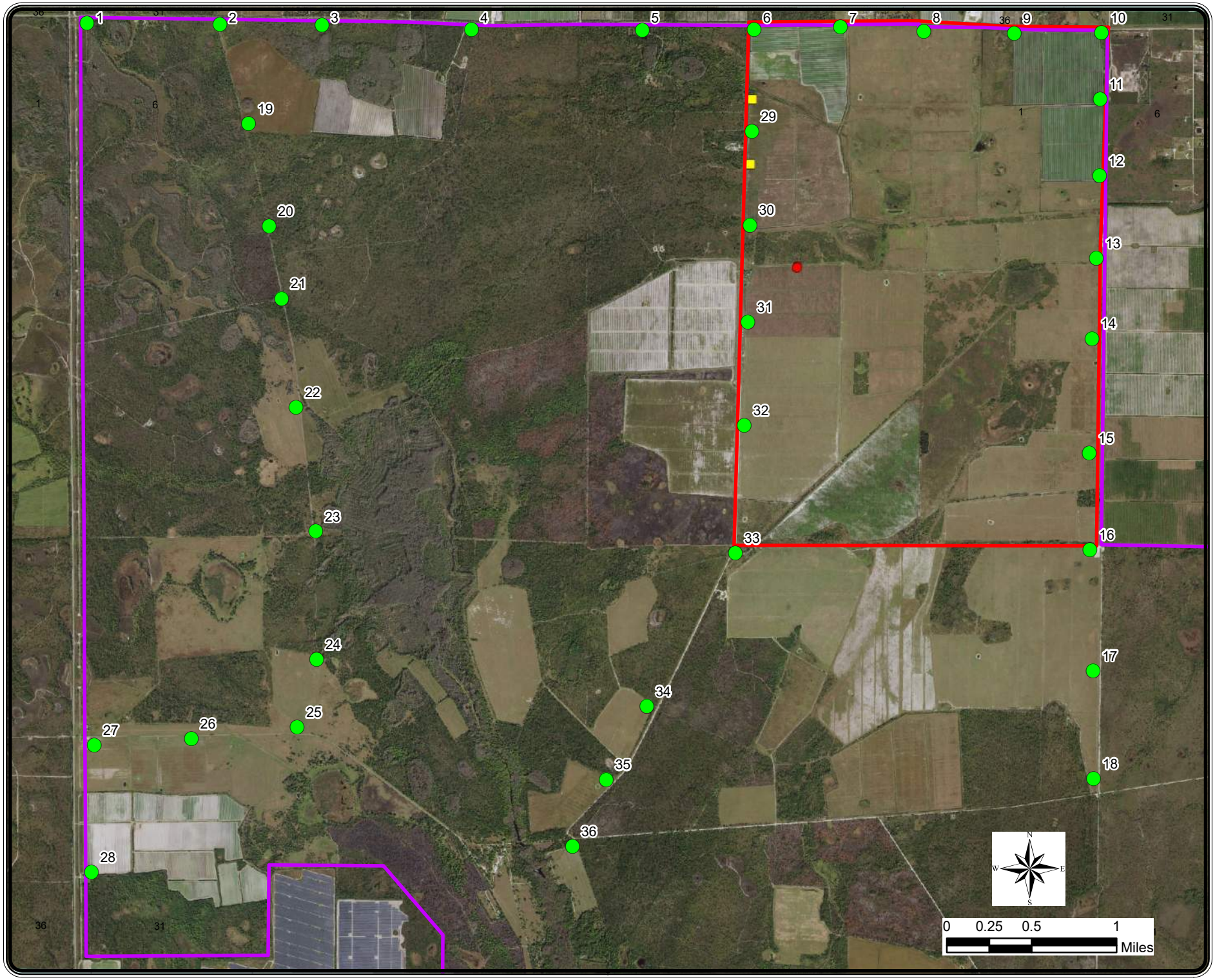


FIGURE 13- AERIAL PHOTO SHOWING WELL LOCATIONS USED FOR THE ANALYTICAL GROUNDWATER FLOW MODEL SIMULATIONS.

well. The results of Scenario 1 indicates that the Babcock Ranch UFA wellfield may produce up to 24.1 MGD on a sustainable basis. Maps showing model simulated drawdowns for the initial iteration (withdrawal rate of 36.0 MGD) and the final iteration (withdrawal rate of 24.1 MGD) for Scenario 1 are provided as Figures 14 and 15. A summary of the three scenarios and corresponding results are provided in Table 3.

TABLE 3- SUMMARY OF ANALYTICAL MODEL SCENARIOS

Scenario No.	Transmissivity (gpd/ft)	Iteration	Pumping Rate (MGD)	Maximum Drawdown (ft)
1	60,000	Initial	36.0	45.6
		Final	24.1	30.6
2	40,000	Initial	25.2	37.7
		Final	20.2	30.2
3	80,000	Initial	36.0	34.2
		Final	32.4	30.8

Scenario 2: Scenario 2 was using the minimum transmissivity of 40,000 gpd/ft and an initial withdrawal rate of 0.7 MGD from each production well for a total wellfield withdrawal of 25.2 MGD. This resulted in a maximum drawdown in the UFA of 37.7 feet. The withdrawal rates from each production well were reduced until the maximum drawdown in the UFA was approximately 30 feet. The drawdown of 30 feet was obtained with a withdrawal rate of 0.6 MGD from each production well. The results of Scenario 2 indicates that the Babcock Ranch UFA wellfield may produce up to 20.2 MGD on a sustainable basis assuming a low-end Transmissivity of 40,000 gpd/ft. Maps showing model simulated drawdowns for the initial iteration (withdrawal rate of 25.2 MGD) and the final iteration (withdrawal rate of 20.2 MGD) for Scenario 2 are provided as Figures 16 and 17. A summary of the three Scenarios and corresponding results are provided in Table 3.

Scenario 3: Scenario 3 was using a high range transmissivity of 80,000 gpd/ft and an initial withdrawal rate of 1.0 MGD from each production well for a total wellfield withdrawal of 36.0 MGD. This resulted in a maximum drawdown in the UFA of 34.2 feet. The withdrawal rates from each production well were reduced until the maximum drawdown in the UFA was approximately 30 feet. The drawdown of 30 feet was obtained with a withdrawal rate of 0.9 MGD from each production well. The results of Scenario 2 indicates that the Babcock Ranch UFA wellfield may produce up to 32.4 MGD on a sustainable basis assuming a high-end Transmissivity of 80,000 gpd/ft. Maps showing model simulated drawdowns for the initial iteration (withdrawal rate of 36.0 MGD) and the final iteration (withdrawal rate of 32.4 MGD) for Scenario 3 are provided as Figures 18 and 19. A summary of the three Scenarios and corresponding results are provided in Table 3.

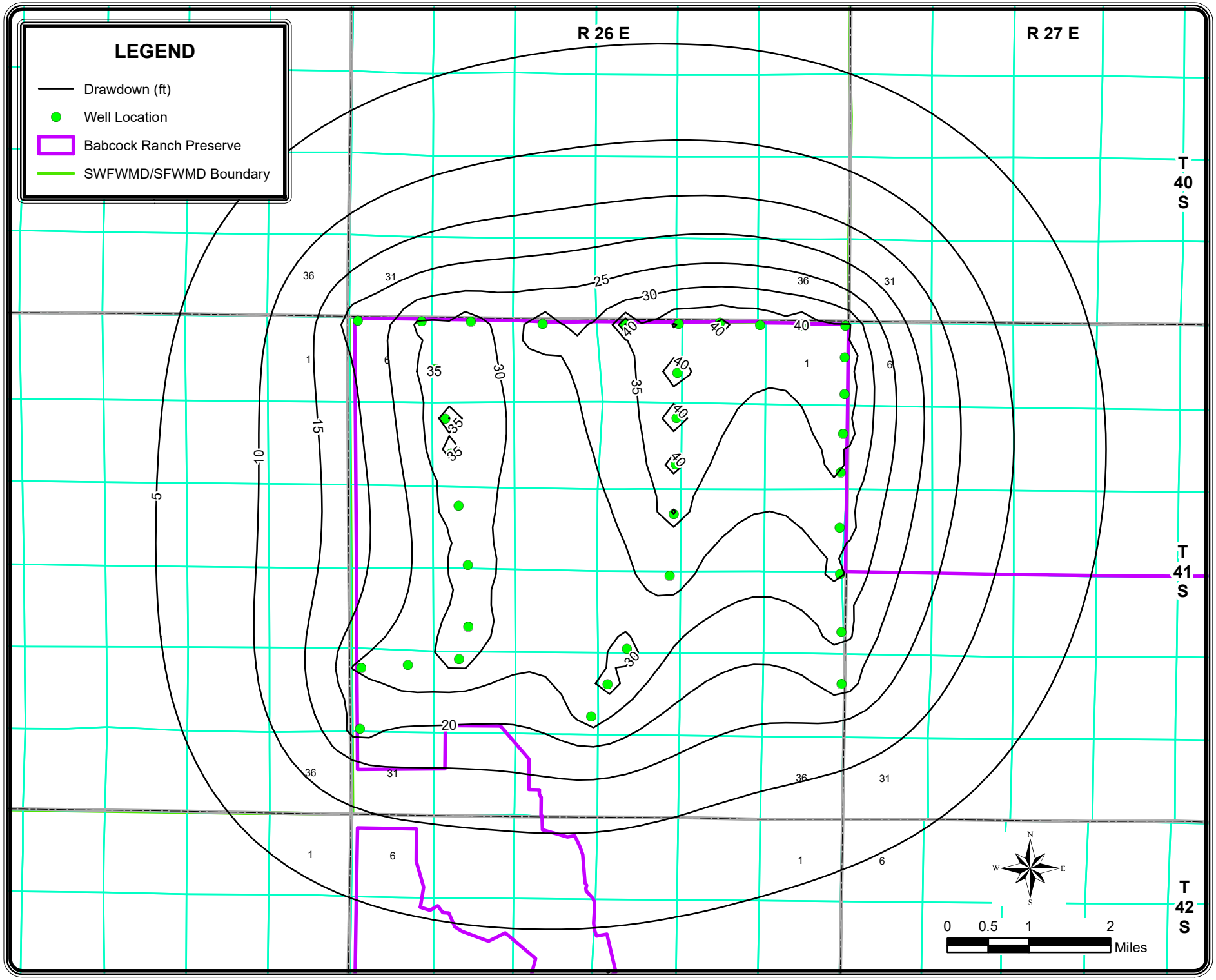


FIGURE 14- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 60,000 GPD/FT AND A WITHDRAWAL RATE OF 36.0 MGD.

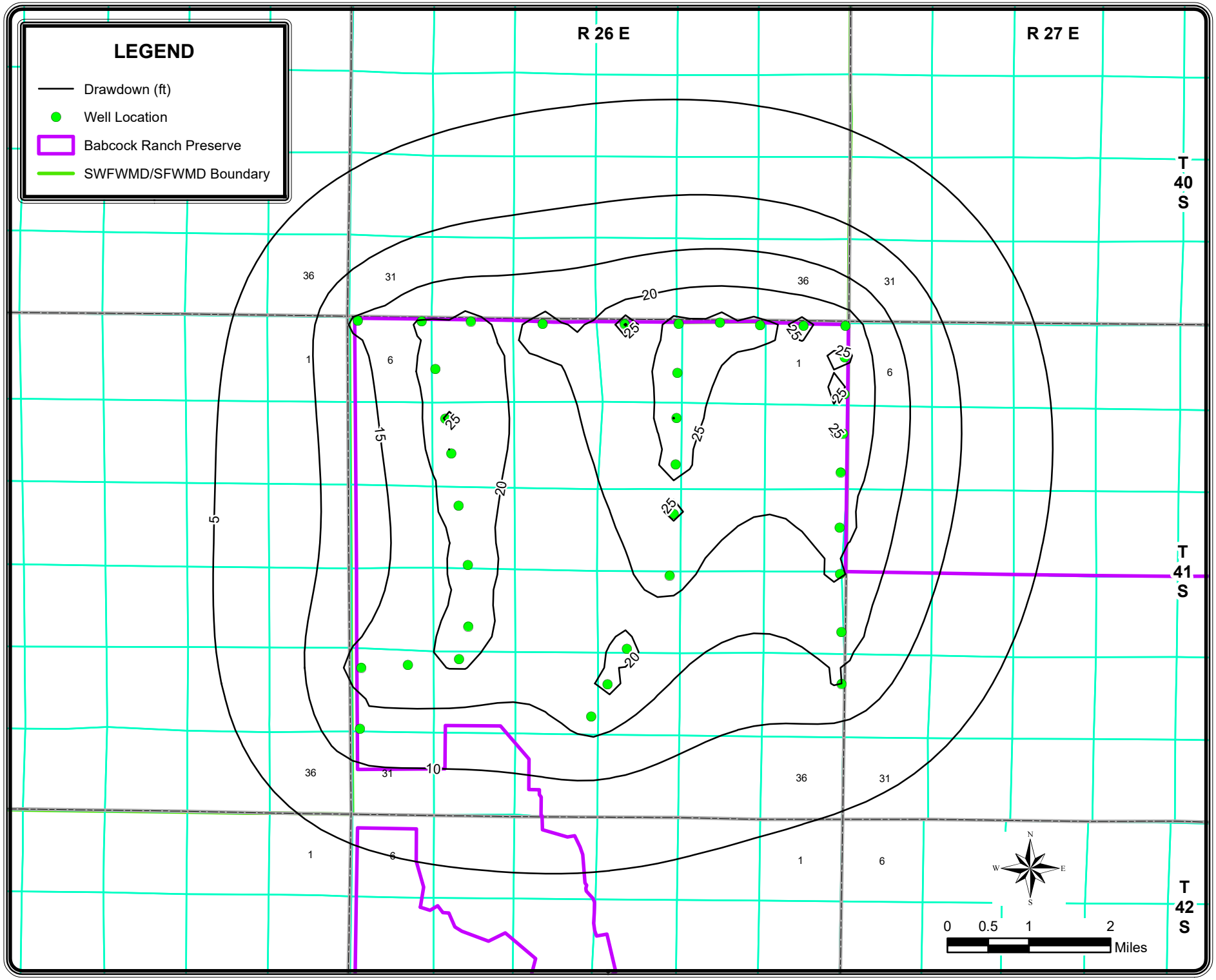


FIGURE 15- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 60,000 GPD/FT AND A WITHDRAWAL RATE OF 24.1 MGD.

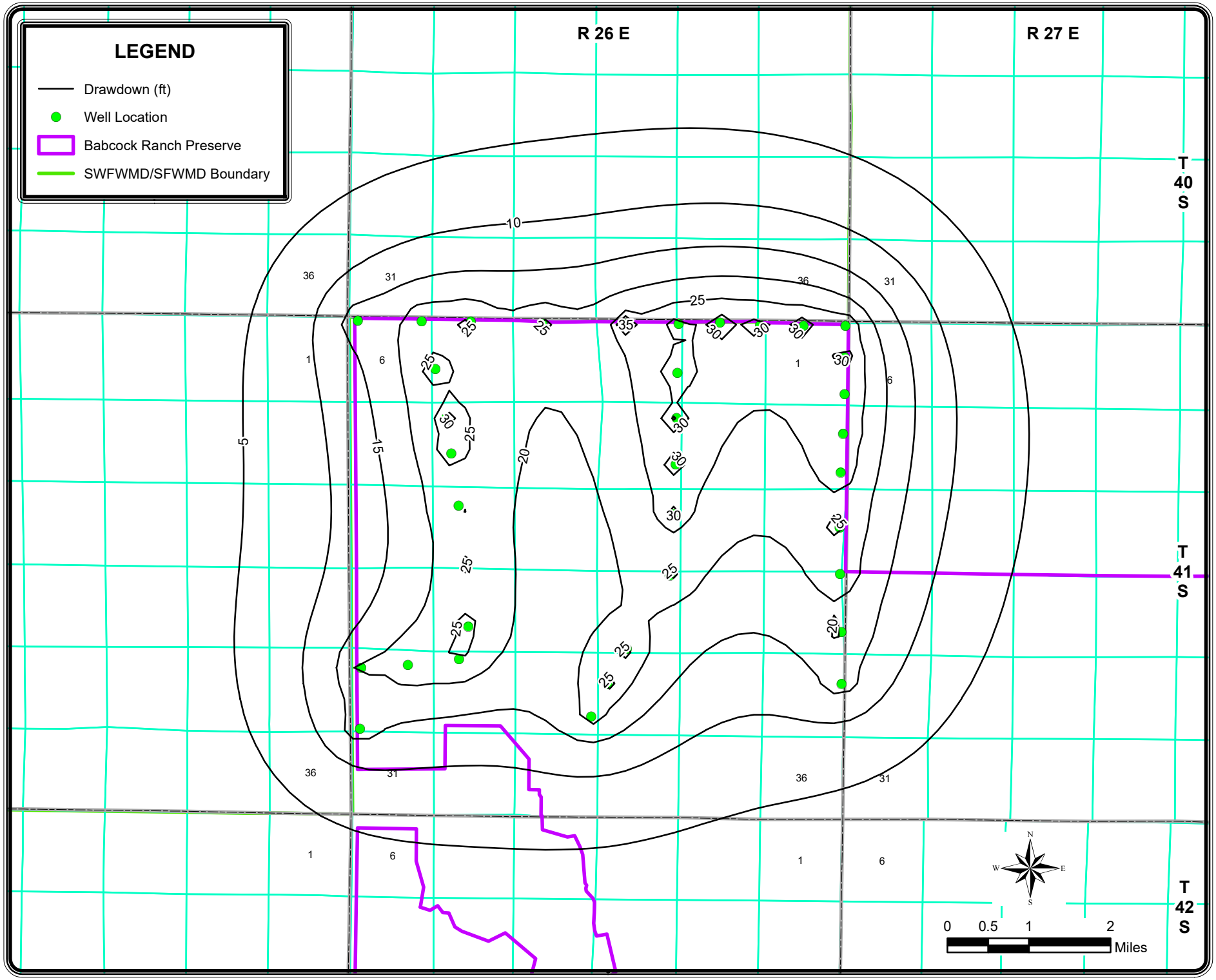


FIGURE 16- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 40,000 GPD/FT AND A WITHDRAWAL RATE OF 25.2 MGD.

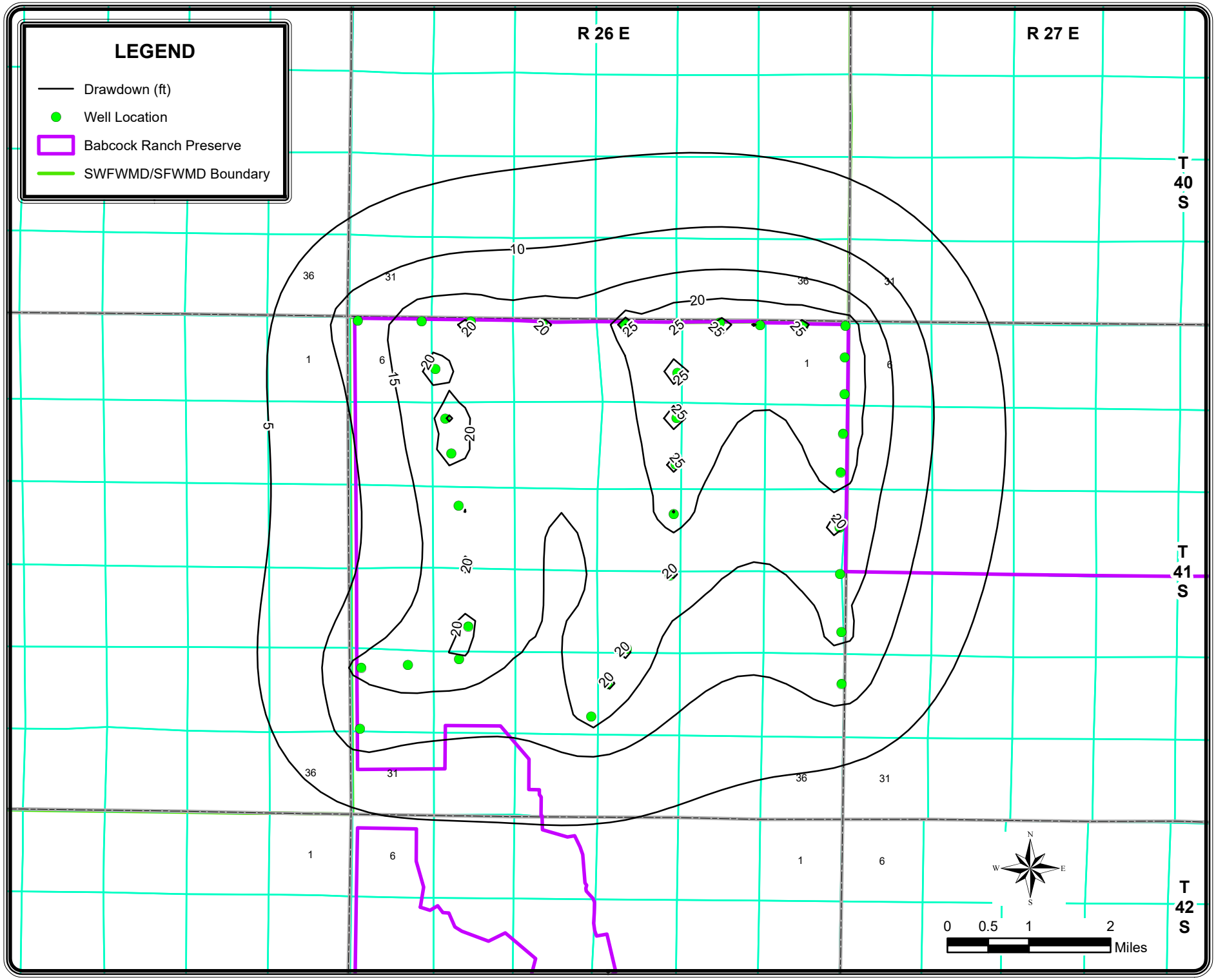


FIGURE 17- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 40,000 GPD/FT AND A WITHDRAWAL RATE OF 20.2 MGD.

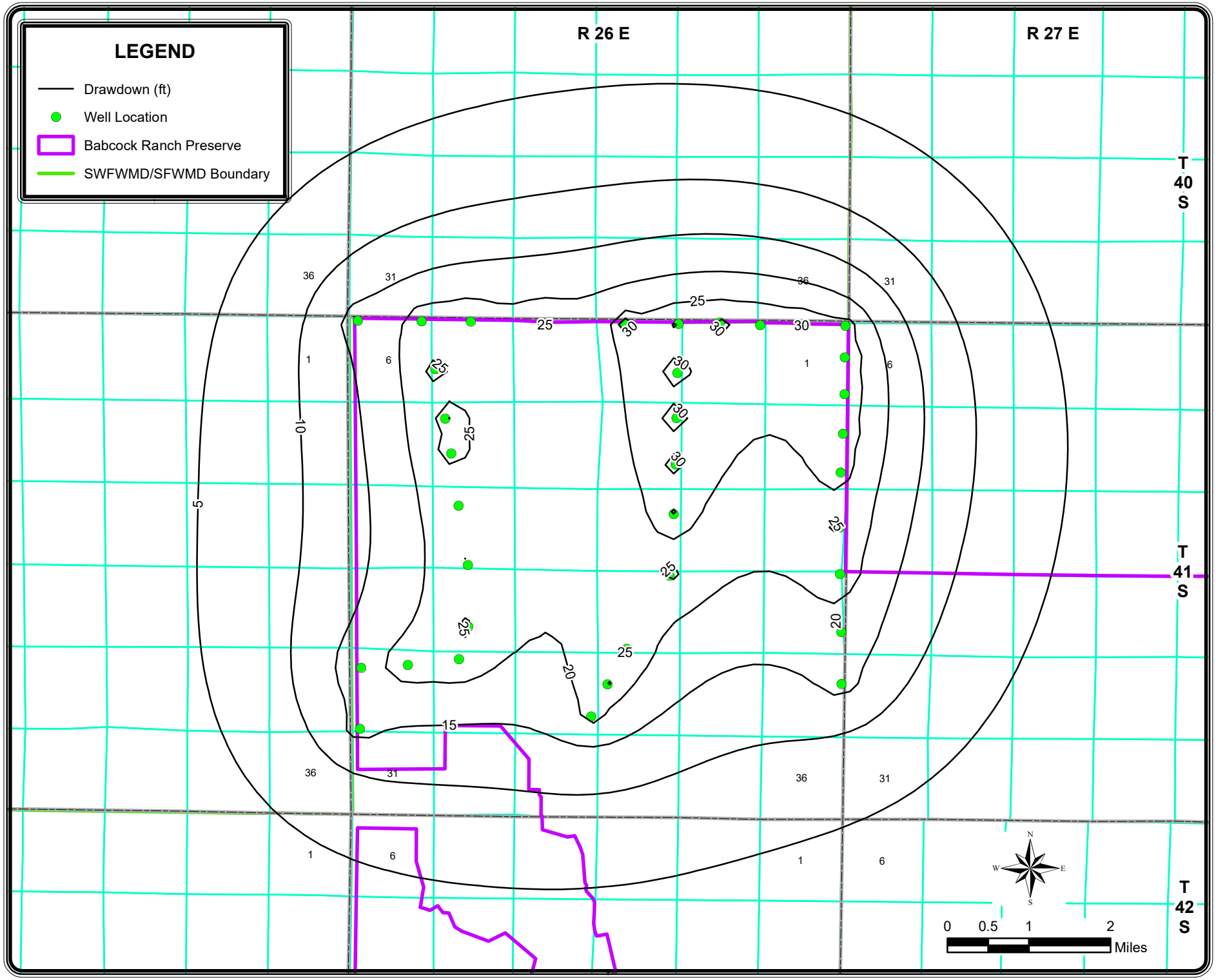


FIGURE 18- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 80,000 GPD/FT AND A WITHDRAWAL RATE OF 36.0 MGD.

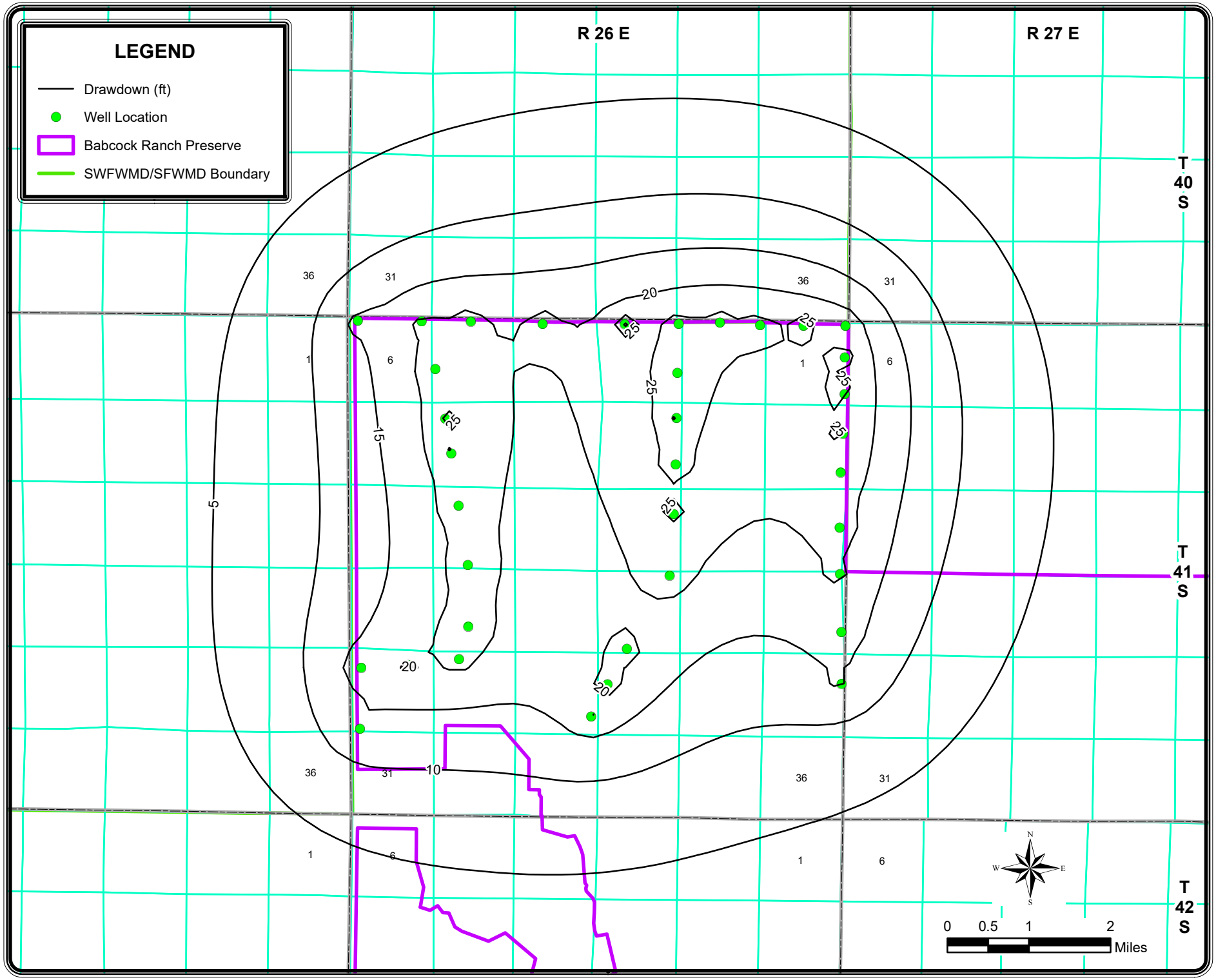


FIGURE 19- DRAWDOWN CONTOUR MAP FOR THE BABCOCK RANCH UFA WELLFIELD USING A TRANSMISSIVITY OF 80,000 GPD/FT AND A WITHDRAWAL RATE OF 32.4 MGD.

It should be noted that additional investigations should be conducted to precisely delineate wellfield safe yield, wellfield alignments with optimum interwell spacing, and water quality changes with time resulting from proposed withdrawals. Those hydrogeologic investigations should include test well drilling, aquifer performance testing, calibrated three-dimensional groundwater flow modeling, and solute transport computer modeling.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The following conclusions are made as a result of this investigation:

- The SFWMD water use permit for the CCUD Babcock Ranch wellfield allows for withdrawals of up to 372 million gallons a year and 93 million gallons a month from the Upper Floridan aquifer via three production wells.

- The available hydrogeological information for the Babcock Ranch wellfield area indicates that the Upper Floridan aquifer could provide relatively large volumes of groundwater on a sustainable basis.

- Water levels in the Upper Floridan aquifer are not above land surface in the Babcock Ranch wellfield area. Water levels in the Upper Floridan aquifer range from 4 to 10 feet below land surface.

- The Upper Floridan aquifer in the Babcock Ranch wellfield area contains brackish groundwater with chloride concentrations ranging from 500 to 700 milligrams per liter.

- Hydraulic parameters for the Upper Floridan aquifer in the general area of the Babcock Ranch indicates the aquifer is anticipated to be productive enough for the development of a public water supply wellfield.

- Based on the available hydrogeologic data, the northwest portion of the Babcock Ranch preserve is preliminary recommended for the design of an Upper Floridan aquifer wellfield.

- Preliminary analytical groundwater flow modeling for the Babcock Ranch wellfield indicates that an Upper Floridan aquifer wellfield could provide from 20.2 to 32.4 MGD of raw groundwater on a sustainable basis. An average of 24.1 MGD was obtained with the analytical groundwater flow simulations.

B. Recommendations

The following recommendations are made as a result of this investigation:

- Additional hydrogeologic investigations should be conducted to determine precise safe yield for the Babcock Ranch wellfield. Investigations may include test well drilling, aquifer performance testing, and three-dimensional groundwater flow and solute transport computer modeling.

V. REFERENCES

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Prepared by:

Omar Rodriguez, P.G., P.E. October 31, 2022
President, RMA GeoLogic Consultants
FL Licensed Professional Geologist #2273
FL Licensed Professional Engineer #80330