Charlotte County Utilities Department

2023 Annual Report
March 2024

Prepared by

JonesEdmunds 50 YEARS 1974-2024

2023 ANNUAL REPORT

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SIGN-OFF SHEET

This document, titled 2023 CCU Annual Report, was prepared by Jones Edmunds & Associates, Inc., with the Charlotte County Utilities Department's assistance. Some information included was collected during Jones Edmunds' field observations of facilities. Other information, including financial and statistical information, was provided by Charlotte County Utilities Department staff. The report reflects Jones Edmunds' judgment and professional opinions in light of the information available at the time of preparation. Third-parties are solely responsible for any use, reliance, or decisions made based on this report. Jones Edmunds accepts no responsibility for damages, if any, suffered by any third-party resulting from decisions made or actions based on this report.

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Definition
AADF	Annual Average Daily Flow
ACFM	Actual Cubic Feet Per Minute
AMI	Advanced Metering Infrastructure
AMP	Asset Management Plan
ARV	Air-Release Valve
ASR	Aquifer Storage and Recovery
ATS	Automatic Transfer Switch
AWIA	America's Water Infrastructure Act of 2018
AWT	Advanced Water Treatment
AWWA	American Water Works Association
BCC	Board of County Commissioners
BFP	Belt Filter Press
BOD	Carbonaceous Biochemical Oxygen Demand (5 day)
CAAP	Capacity Assessment and Assurance Program
CAR	Capacity Analysis Report
CCC	Chlorine Contact Chamber
CCR	Consumer Confidence Report
CCTV	Closed-Circuit Television
CCU	Charlotte County Utilities Department
CDL	Commercial Driver's License
CDOC	Continuing Demonstrations of Capability
CHWA	Charlotte Harbor Water Association
CIP	Capital Improvement Program
CMOM	Capacity, Management, Operation, and Maintenance
CMP	Capital Maintenance Plan
CR	County Road
CRA	Community Redevelopment Area
CY	Calendar Year
°F	Degrees Fahrenheit
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
EAMS	Enterprise Asset Management System
EPA	US Environmental Protection Agency
EPLAB	East Port Laboratory
EQ	Equalization
ERP	Emergency Response Plan
ERU	Equivalent Residential Unit
EWD	Englewood Water District
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection

Abbreviation	Definition
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FPSC	Federal Public Service Commission
FOG	Fat, Oil, and Grease
FSAWWA	Florida Section of AWWA
FY	Fiscal Year
GDC	General Development Corporation
GDU	General Development Utilities
GIS	Geographical Information System
GIWA	Gasparilla Island Water Association
GMLS	Grand Master Lift Station
gpd	Gallons Per Day
gph	Gallons Per Hour
gpm	Gallons Per Minute
GPS	Global Positioning System
GST	Ground Storage Tank
HDPE	High-Density Polyethylene
HMI	Human Machine Interface
HOA	Homeowners Association
HP	Horsepower
HSP	High-Service Pump
HSPS	High-Service Pump Station
I&C	Instrumentation and Controls
I/I	Inflow and Infiltration
IDOC	Initial Demonstrations of Capability
IR	Internal Recycle
IW	Injection Well
kVA	Kilovolt-Ampere
kW	Kilowatt
lb/day	Pounds per Day
LED	Light-Emitting Diode
LES	Liquid Environmental Solutions
LIMS	Laboratory Information Management System
LPS	Low-Pressure Sewer
LS	Lift Station
LTF	Leachate Treatment Facility
µS/cm	Micro Siemens Per Centimeter
MADF	Monthly Average Daily Flow
MBR	Membrane Bioreactor
MCC	Motor Control Center
MDF	Maximum Daily Flow
MG	Million Gallon

Abbreviation	Definition
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
MIT	Mechanical Integrity Test
mL	Milliliter
MLE	Modified Ludzack-Ettinger
MLSS	Mixed Liquor Suspended Solids
MLVSS	Mixed Liquor Volatile Suspended Solids
mm	Millimeter
MRS	Master Reuse System
MSBU	Municipal Service Benefit Unit
NEC	National Electrical Code
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NFPA	National Fire Protection Association
O&M	Operations and Maintenance
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PAC	Powdered-Activated Carbon
PACT	Powdered-Activated Carbon Treatment
PLC	Programmable Logic Controller
PMF	Peak Monthly Flow
ppm	Parts Per Million
PSAR	Public Supply Annual Report
Authority	Peace River Manasota Regional Water Supply Authority
PRF	Peace River Facility
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
PWS	Potable Water System
QAS	Quality Assurance Specialist
R&R	Renewal and Replacement
RAS	Return-Activated Sludge
RO	Reverse Osmosis
RRA	Risk and Resilience Assessment
RTS	Regional Transmission System
RTU	Radio Telemetry Units
RWBS	Reclaimed Water Booster Stations
SCADA	Supervisory Control and Data Acquisition
scfm	Standard Cubic Foot per Minute
SDS	Safety Data Sheet
SF	Square Feet
SFWMD	South Florida Water Management District
SM	Standard Method
SOP	Standard Operating Procedure

Abbreviation	Definition
SPD	Surge Protective Device
SR	State Road
SRF	State Revolving Fund
SRS	Septage Receiving Station
SWFWMD	Southwest Florida Water Management District
TCU	Telemetry Control Unit
TDH	Total Dynamic Head
TDS	Total Dissolved Solids
TMADF	3-Month Average Daily Flow
TN	Total Nitrogen
TNI	The NELAC Institute
TP	Total Phosphorus
TSS	Total Suspended Solids
UCMR4	Unregulated Contaminant Monitoring Rule
UF/IFAS	University of Florida/Institute for Food and Agricultural Sciences
UIC	Underground Injection Control
UV	Ultraviolet
VFD	Variable-Frequency Drive
VS	Vacuum Station
WAS	Waste-Activated Sludge
WBS	Water Booster Stations
WO	Work Order
WRF	Water Reclamation Facility
WTP	Water Treatment Plant
WUP	Water Use Permit

GLOSSARY

Term	Description
Activated sludge	A process for treating wastewater using air and a biological floc to reduce the organic content of the wastewater.
Annual average daily flow (AADF)	The total volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 365 days divided by 365.
Backflow prevention	A physical means to keep water from flowing back into a water system once it is discharged from the system. Examples are air gaps, double-check valve assemblies, and reduced-pressure zone devices.
Consumer Confidence Report (CCR)	An annual water-quality report required by the US Environmental Protection Agency and Florida Department of Environmental Protection and distributed to the customers of a water utility.

Term	Description
Cross-connection	Any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device that contains or may contain contaminated water, sewage, or other waste or liquid of unknown or unsafe quality that may be capable of imparting contamination to the public water supply resulting from backflow.
Deep injection well	A well drilled into a confined, non-potable aquifer for disposal of treated wastewater.
Force main	A pressure pipe joining the pump discharge at a wastewater pumping station with a point-of-gravity flow.
Gravity sewer	Piping installed at a gradual incline (slope) that allows wastewater to flow exclusively by the energy of gravity.
Headworks	The *front end* of a wastewater treatment plant that removes items from wastewater that cannot be removed by the treatment process.
Lift station (pumping station)	A structure equipped with pumps to impart energy to convey wastewater through a force main.
Low-pressure sewer	An alternative to gravity sewers that requires a small pump at each property. Piping is small and shallow and can be constructed to follow the contours of the land as opposed to deeper and larger pipes necessary to accommodate the slopes required for gravity sewers.
Peak day flow	The largest volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 24-hour period.
Peak hour flow	The largest volume of wastewater flowing into a wastewater facility or water flowing from a water facility during any consecutive 1-hour period.
Public-access reclaimed water	Treated wastewater meeting the requirements of Chapter 62-610, Part III, of the Florida Administrative Code, for application on areas accessible to the public.
Restricted-access reclaimed water	Treated wastewater meeting the requirements of Chapter 62-610, Part II, of the Florida Administrative Code, for application on areas where access by the public is controlled and infrequent.
Reverse osmosis	A water treatment method that uses pressure and a semi-permeable membrane to purify water.
Three-month average daily flow	The total volume of wastewater flowing into a wastewater facility or water flowing from a water facility during 3 consecutive months divided by the number of days in this 3-month period.
Vacuum sewer	A mechanized system of wastewater transport that relies on differential air pressure to move wastewater. Vacuum pumps maintain a negative pressure on the collection system. The differential pressure between atmosphere and vacuum is the driving force that conveys wastewater through the system.

EXECUTIVE SUMMARY

INTRODUCTION

The 2023 Charlotte County Utilities (CCU) Annual Report updates the public and bond holders on the utility system's status and provides CCU staff with a tool for planning capital projects and improving operations. The report provides a high-level review and update of CCU's administration organization, financial information, major events, Capital Improvement Program (CIP) projects, and the conditions and recommendations for the water treatment plants, water distribution systems, wastewater collection systems, wastewater treatment facilities, and reclaimed water distribution systems.

ADMINISTRATION

The Board of County Commissioners (BCC) periodically reviews and determines the appropriate rate structure for providing services to current customers. The County completed a rate study in Fiscal Year (FY) 2023 through Raftelis. New rates were approved by the BCC on September 12, 2023, and adopted via Ordinance 2023-156 to increase rates for water, wastewater, and reclaimed water by 7.07 percent, effective October 1, 2023.

The total Operations and Maintenance (O&M) revenue for FY 2023 was:

- $ 94,152,515 (water and wastewater services).
- $ 7,798,205 (connection charges).
- $ 14,216,339 (connection fees).

In FY 2023, CCU continued to experience growth, with the number of active water customers increasing by 3.5 percent (from 66,734 to 69,113) and the number of active wastewater customers increasing by 4.7 percent (from 43,932 to 46,037).

WATER TREATMENT PLANTS

Chapter 3 presents an overview of the Peace River Facility (PRF) and a detailed assessment of the County-owned Reverse Osmosis (RO) Water Treatment Plant (WTP). CCU has two water supply sources for its two independent public water systems (PWSs). CCU is a member government of and purchases treated water from the Peace River Manasota Regional Water Supply Authority (Authority) for the consecutive PWS that serves Mid and West Counties. The Authority owns, operates, and maintains the PRF, which has its own water use permit and provides treated surface water to neighboring counties. Charlotte County's allocation of the Authority-produced water is 16.1 million gallons per day (MGD) annual average daily flow (AADF), 19.32 MGD for the peak month, and 22.54 MGD for the maximum day. In FY 2023, CCU used 12.2 MGD AADF or approximately 76 percent of the water allocated by the Authority under AADF conditions. Recommendations are not provided for Authority-owned facilities.

CCU also owns and operates the Burnt Store RO WTP, which produces water for the Burnt Store PWS serving South County. The Burnt Store RO WTP operates under Water Use Permit No. 3522, which expires in 2033. As currently configured, the Burnt Store RO WTP capacity is 3.61 MGD with 1.5 million gallons (MG) of storage. In FY 2023, the Burnt Store RO WTP operated at an average daily rate of 0.74 MGD or approximately 20 percent of its design

capacity. Raw water was supplied by five water production wells for most of FY 2023; however, the water is currently supplied by six water production wells now that Well No. 8 has been reactivated and is back in production. Concentrate from the treatment process is disposed of into two on-site deep injection wells with a combined capacity of 3.44 MGD.

Primary recommendations for the Burnt Store RO WTP include:

- Continue to maintain and repair the membranes to extend life to the extent feasible (also replace end caps and leaks).
- Complete evaluation to determine remaining membrane life for Trains A through E, and develop a membrane replacement schedule to meet short- and long-term demands for the growing community with redundancy for operations.
- Permit and install new groundwater wells as needed to meet future water demands.

WATER DISTRIBUTION

Chapter 4 reviews and discusses CCU's distribution system infrastructure for its two independent PWSs. At the end of FY 2023, the Port Charlotte PWS had 65,578 water service connections, and the population, based on units served, was estimated to be approximately 162,474. The Port Charlotte PWS consists of approximately 1,479 miles of water main, six water booster stations (WBSs), four ground storage tanks (GSTs) totaling 10 MG of potable water storage, one disinfection station, eight supply interconnects with the Authority, and seven emergency interconnects with neighboring water utilities. The Authority also has an additional 12 MG of storage capacity available to Authority members for emergency fire flow or for general distribution during temporary loss of treatment at the PRF. For FY 2023, the total unaccounted-for water loss for the Port Charlotte PWS was 10.1 percent.

Primary recommendations for the Port Charlotte PWS include:

- Complete pumping and ground storage tank (GST) improvement projects to the existing WBSs to meet future demands (projects for the existing Gulf Cove, Golf Course, Walenda, and Rotonda WBSs are currently ongoing).
- Complete various Potable Water Master Plan CIP recommendations related to water quality and minimizing water flushing such as main looping and installing in-line WBSs in focus areas.
- Evaluate future water supply options, including permitting Babcock Ranch wellfield as a primary water supply or increasing water supply allocation from the Authority.

At the end of FY 2023, the Burnt Store PWS had 3,535 service connections, and the population, based on units served, was estimated to be approximately 10,254. The Burnt Store PWS distribution system consists of 53 miles of water main and has no water supply interconnects or emergency interconnects with neighboring water utilities. For FY 2023, the total unaccounted-for water loss for the Burnt Store PWS was 17.1 percent. Historically, Charlotte County has experienced higher-than-typical water loss in the Burnt Store PWS; CCU has investigated the water loss extensively, including completing an Unaccounted Water Investigation Report in 2021, which triggered a water audit with a plan to mitigate the high loss. CCU continues to install new C-900 PVC pipes to mitigate leaks in the system.

The primary recommendation for the Burnt Store PWS distribution system includes:

- Investigate the potential to install interconnects with neighboring utilities to increase system resiliency.

CCU performs annual maintenance on pipes, valves, meters, and hydrants throughout both distribution systems. In FY 2023, CCU repaired 148 hydrants and serviced 654 hydrants; repaired 87 line breaks on pipes 3 inches in diameter or larger; and installed two new valves, replaced 15 valves, exercised 976 valves, and serviced 1,200 valves throughout the Port Charlotte and Burnt Store PWSs. The 2022 Consumer Confidence Reports (CCRs) confirm that the water delivered by both CCU water distribution systems meets or exceeds regulatory quality requirements.

WASTEWATER COLLECTION

Chapter 5 presents the CCU wastewater collection systems, which currently serve 46,037 customer accounts in four distinct collection areas. Based primarily on CCU's geographic information system (GIS), the collection system consists of approximately 512 miles of gravity sewer, 409 miles of low-pressure sewers (LPSs), 45 miles of vacuum sewer, four vacuum stations, 202 miles of force main, 310 lift stations (owned by CCU), and 8,100 manholes. Wastewater from each customer is collected and conveyed to one of four water reclamation facilities (WRFs) based on location. Additional wastewater is hauled from septic tanks throughout the County for treatment at the East Port WRF. CCU owns tanker trucks that are used to haul wastewater from septic tanks on an as-needed basis, and from lift stations and vacuum stations during emergencies. The Wastewater Collection workgroup has a maintenance program that includes condition assessment inspections by closed-circuit television (CCTV) and collection line cleaning to restore/maintain hydraulic capacity.

During FY 2023, a site review of representative facilities selected by CCU showed them to be functioning as intended but generally in fair to poor condition with the exception of the newly rehabilitated stations.

General recommendations for the CCU wastewater collection system include:

- Complete recommendations from CCU's capacity, management, operations, and maintenance (CMOM) program.
- Continue to evaluate system capacity and impacts of inflow and infiltration (I/I) using recommended tools from the Capacity Assessment and Assurance (CAAP) Program Framework Development and Flow Monitoring Program.
- Evaluate rehabilitating lift stations.
- Continue to use the hydraulic modeling to assess the need for upgrades.
- Continue to televise and repair gravity sewers and manholes.
- Install odor-control systems at lift stations that are significantly impacted by sewer gases.

WASTEWATER TREATMENT FACILITIES

Chapter 6 includes an overview and discussion of CCU's four WRFs and the Zemel Road Leachate Treatment Facility (LTF). Table ES-1 summarizes permit information and current percent permit capacity associated with each WRF. WRFs are complex facilities that require continual repair and rehabilitation to maintain operations and expansions to accommodate

growth in Charlotte County. In FY 2023, the East Port WRF, West Port WRF, and Rotonda WRF operated within their permit limits for flow and effluent quality. Burnt Store WRF generally met flow and effluent quality requirements but experienced total nitrogen exceedances; treatment quality will be improved to advanced water treatment (AWT) as part of the plant expansion.

Table ES-1 CCU WRFs Flow and Capacity Statistics

Facility	Current Permitted Capacity (MGD AADF)	Current AADF (MGD)	Current Maximum TMADF (MGD)	Current Permitted Operating Capacity[1] (%)	Current Maximum TMADF Operating Capacity[2] (%)
East Port	6.0[a]	5.02	5.69	84	95
West Port	1.2[b]	0.73	0.59	61	49
Rotonda	2.0[c]	1.13	1.49	57	75
Burnt Store	0.5[d]	0.31	0.40	62	80

Notes:

[1] Based on the current AADF/permitted capacity.

[2] Based on the current highest 3-month average daily flow (TMADF)/permitted capacity, which is used to help determine when a facility should begin planning for expansion.

[a] Construction of the expansion from 6 MGD to 9 MGD, including advanced water treatment (AWT) modifications, is expected to be completed by Fall 2026.

[b] Design for expansion to 5.0 MGD AADF is currently underway and expected to be completed in December 2025.

[c] Rotonda design for AWT improvements and expansion to 2.5 MGD is underway; the construction schedule is to be determined.

[d] Construction for expansion from 0.5 MGD to 2.5 MGD, including AWT modifications, is expected to be completed by 2027.

Primary recommendations for the WRFs include:

- Complete the AWT plant expansion upgrades at the East Port and Burnt Store WRFs.
- Evaluate improvements for biosolids-handling facilities at all four WRFs.
- Complete the West Port WRF expansion project, including evaluating the future expansion of the Rotonda WRF.

The Zemel Road LTF uses powder-activated carbon (PAC) to treat the leachate originating from the Zemel Road Class 1 landfill. The LTF has a capacity of 0.25 MGD and conveys treated effluent to a deep injection well. The plant is operating within its permitted treatment capacity, but some improvements are recommended to maintain operations.

The primary recommendations for the LTF include:

- Evaluate the effluent pumping operations.
- Complete the rehabilitation of Lift Station (LS) No. 3.

RECLAIMED WATER DISTRIBUTION SYSTEM

Chapter 7 discusses CCU's reclaimed water distribution systems including the Master Reuse System (MRS) serving the Mid and West County areas and the Burnt Store reclaimed water distribution system serving South County. The MRS is fed by the East Port, West Port, and Rotonda WRFs and contains approximately 50 miles of transmission mains, four reclaimed water booster stations (RWBSs), three GSTs with a total volume of 4.0 MG, and three storage ponds with a total volume of 115 MG. The MRS infrastructure is in good condition; however, it requires more pipe hydraulic capacity to allow more reclaimed water to be transferred from Mid County to West County to major users. The Burnt Store reclaimed water distribution system primarily consists of one 7-mile-long transmission main that is currently serving five customers. The system infrastructure is in good condition.

CCU's current goal is to encourage the beneficial use of reclaimed water and continue expanding the system to serve additional customers, with a focus on large users.

The primary recommendations for the reclaimed water distribution system include:

- Evaluate improvements to pumping and transmission capacity to convey excess reclaimed water supply from Mid County to West County as recommended in the Reclaimed Water Master Plan.
- Install throttling control valves at all current major reclaimed water users with pond discharges in the Mid and West County areas.
- Develop and conduct a community survey to better determine potential customer interest in reclaimed water reuse (to be used to evaluate economic feasibility of the distribution system expansion opportunities).
- Replace the ultraviolet (UV)-damaged transducer screens at the RWBSs.

ENGINEERING

As Charlotte County's population continues to grow, CCU's ability to develop plans that address the projected growth is vital. The Engineering Division develops CIP projects for CCU's water, wastewater, and reclaimed water infrastructure systems. Table ES-2 summarizes the FY 2023 CIP budget dollars and expenditures for the three infrastructure sectors. The budget includes multi-year CIP projects; therefore, expenditures occur over multiple years. Chapter 8 provides details of the CIP budget and expenditures.

Table ES-2 FY 2023 CIP Budget and Expenditures

Infrastructure Sector	Budget	Expenditure
Water	$9,160,000	$155,000*
Wastewater	$19,615,000	$12,554,000*
Reclaimed Water	$3,900,000	$569,000*

Note: Does not include expenditures for removal and replacement (R&R) of existing facilities and assets or expenditures related to new developments.

UTILITY SUPPORT SERVICES

Chapter 9 discusses support services for CCU services including state-certified laboratory testing, asset management (Cityworks), and Operation and Information Technology (Supervisory Control and Data Acquisition [SCADA] and Cybersecurity).

The East Port Laboratory (EPLAB) conducts most water quality testing for the County's facilities. The EPLAB is certified to conduct analyses by the Florida Department of Health (FDOH) according to The NELAC Institute (TNI) Standards. During FY 2023, the EPLAB participated in and passed two TNI/FDOH-mandated Proficiency Testing studies. In FY 2023, the laboratory processed 8,520 samples, including performing 32,714 analyses and additional field sampling and sample courier service responsibilities. Due to upcoming AWT plant expansions at East Port WRF and Burnt Store WRF, staffing requirements may need to be evaluated so that laboratory analysis services are not negatively impacted by new monitoring requirements. The EPLAB uses Laboratory Information Management System (LIMS) – a data management software that generates paper documentation forms and sample identification numbers to record and track test results.

Jones Edmunds is working with CCU to implement the Cityworks Enterprise Asset Management System (EAMS) to track work and the status of assets across the County. This work is in conjunction with Cityworks implementation in other County departments to standardize the work and asset tracking in a robust system with capabilities to schedule routine maintenance and tasks, identify and track hot spots and issues with infrastructure, and report on key performance indicators.

Operation and Information Technology refers to CCU's SCADA and Cybersecurity infrastructure. CCU uses SCADA to monitor and control facility operations. Several facilities represent multiple projects involving different engineers, bid contractors, and SCADA system integrators. This has resulted in a SCADA system of mixed hardware, software, and architectures that includes diverse and separate operations. A SCADA Master Plan was completed in FY 2020. The primary goal of the SCADA Master Plan was to define and document a road map for implementing the technology, practices, and organizations required to meet CCU's short-term and long-term goals for SCADA. CCU has since converted SCADA software at several facilities from Wonderware to VTScada. Chapter 9 includes recommendations from the SCADA Master Plan.

CONSOLIDATED RECOMMENDATIONS

Chapter 10 consolidates all recommendations discussed throughout this Annual Report for each CCU water, wastewater, and reclaimed water facility visited during this assessment.

1 INTRODUCTION

1.1 PURPOSE AND SCOPE

The Charlotte County Utilities Department (CCU) prepares an Annual Report to provide the public with a utilities status update and to fulfill Revenue Bond requirements. The bonds issued to Charlotte County require that the County retain the services of a licensed professional engineer to verify the quality of CCU's operations. The bond covenant states:

> *The Issuer shall at all times employ Consulting Engineers, whose duties shall be to make any certificates and perform any other acts required or permitted of the Consulting Engineer under this Resolution, and also to review the construction and operation of the System at least once a year, and, not more than 120 days prior to the end of each Fiscal Year, to submit to the Issuer a report with recommendations as to the proper maintenance, repair and operation of the System during the ensuing Fiscal Year, including recommendations for expansion and additions to the System to meet anticipated service demands, and an estimate of the amount of money necessary for such purposes. Copies of such reports, recommendations and estimates made as here in above provided shall be filed with the issuer for the inspection by bondholders, if such inspection is required.*

Table 1-1 summarizes the principal balances for CCU bonds as of Fiscal Year (FY) 2023.

Table 1-1 Principal Balances on CCU Bonds by FY 2023

Bond Issues	Original Issuance	Current Debt	Comments
2008 Bond	Wastewater Expansion – 1998	$8,815,000	Wastewater Expansion Program
2011 Bond	Refinance – 2011	$0	Refinanced Debt
2013 Bond	Refinance – 2003A	$0	Refinanced Debt
2016 Bond	Refinance – 2006 and part of 2011	$7,930,000	Refinanced Debt
2021 Bond	Refinance – 2011	$12,990,000	Refinanced Debt
	Total Current Bond Debt	$29,735,000	
	State Revolving Fund (SRF) Debt	$66,768,464	
	Tax-Exempt Commercial Paper	$0	
	Total Long-Term Debt	$96,503,464	

The Report is divided into the following chapters:

1. **Introduction**: General information concerning the report's preparation.
2. **Administration**: Charlotte County government structure and CCU's organization, administration programs, and financial information.
3. **Water Treatment Plants**: Descriptions and records concerning the purchase and production of potable water and the general condition of the components.

4. **Water Distribution System**: Description of the water distribution system and the general condition of components.
5. **Wastewater Collection:** Description and records concerning the collection of wastewater and the general condition of components.
6. **Wastewater Treatment Facilities**: Descriptions and records concerning the facilities used to treat wastewater and leachate and the general condition of the components.
7. **Reclaimed Water Distribution System**: Description of the reclaimed water distribution system and the general condition of the components.
8. **Engineering**: The status of the water, wastewater, and reclaimed water Capital Improvement Program (CIP) projects and a summary of the major engineering reports completed for the County.
9. **Utility Support Services**: Descriptions and records concerning the laboratory facilities, asset management, and information technologies.
10. **Consolidated Recommendations**: Summary of planning recommendations, capital improvements, and operation and maintenance (O&M) items for the water, wastewater, and reclaimed water systems.

1.2 AUTHORITY

Jones Edmunds' preparation of the FY 2023 Annual Report is authorized by Charlotte County Purchase Order No. 2024001006, Work Order No. 25.

1.3 DEMOGRAPHICS

Charlotte County is on the southwest coast of Florida approximately 96 miles south of Tampa. It covers 694 square miles and contains approximately 126 miles of waterways. With an elevation ranging from 5 to 25 feet above sea level, Charlotte County enjoys a sub-tropical climate where the extreme temperatures of summer and winter are subdued by the prevailing gulf breezes. Numerous upland and aquatic preservation areas are in the area. Charlotte Harbor includes one of the world's largest protected marine estuaries, encompassing 270 square miles with 219 miles of natural shoreline.

The Office of Economic and Demographic Research estimated the Charlotte County population in 2023 to be 204,126. In 2009, Port Charlotte was named "Best Place to Retire" by *Money* magazine, and the community has received similar recognition from other sources during the past decade.

A large portion of this coastal community's urban development is in the west third of the County, including the barrier islands abutting the Gulf of Mexico. The Port Charlotte planned residential development occupies most of Central County with some residential lots having canal access to Charlotte Harbor. A large development known as Rotonda is in the west area of the County. Every lot within Rotonda is within a half mile of a golf course.

A growing area in the extreme south area of the County, near the Lee County border, is known as the Burnt Store Corridor because of its location on and near Burnt Store Road. This area encompasses 8 square miles and is currently only 15-percent built out.

Commercial growth along many of the main corridors constitutes over 1,500 acres. Most of the commercial epicenters are along US Highway 41 (US 41) and in the Murdock area of Port Charlotte. Commercial zones have also developed along Kings Highway, Rampart Boulevard,

and State Road (SR) 776. Less than 0.1 percent of the County area consists of industrial development. The industrial development is primarily within the Community Redevelopment Area (CRA) in Charlotte Harbor.

1.4 DEVELOPMENT OF CCU

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 General Development Corporation (GDC), platted the area for residential development communities, generally 0.25-acre residential lots with some commercial areas along main corridors such as US 41. Most GDC developments in the area were supplied water from the GDC-owned and -operated Peace River Manasota Regional Water Supply Facility (PRF), which was constructed in the 1970s and managed by GDC's subsidiary General Development Utilities (GDU).

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 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. The purchased wastewater infrastructure included three treatment plants (South Port and East Port in Mid County and West Port in West County) along with associated transmission lines and collection systems consisting of 140 miles of gravity and low-pressure mains, 56 lift stations, and 61 miles of force mains serving approximately 11,000 sewer connections. CCU eventually grew to operate wastewater, potable water, and leachate treatment plants.

Over the years, CCU has continued to acquire, upgrade, and construct facilities such as water treatment plants (WTPs), WBSs, wastewater treatment facilities, and water reclamation facilities (WRFs) and to expand its collection and distribution system infrastructure as necessary to serve residents, meet demands, treat flows, and maintain permit requirements. The major expansions to the CCU system are listed below, and more detailed improvements can be found in previous Annual Reports:

- In 1991, CCU purchased the GDU assets establishing the CCU water and wastewater systems.
- The Zemel Road Leachate Treatment Facility (LTF) was first permitted in 1991. The plant is owned by Charlotte County Solid Waste and operated by CCU.
- In 1992, CCU established interconnects with North Port at Flamingo Boulevard and Biscayne Boulevard and at Harbor Boulevard.
- CCU constructed the Walenda WBS consisting of a 2-million-gallon (MG) GST in 1993.
- CCU started its reuse program on August 16, 1994, in Mid County.
- CCU acquired Rampart Utilities in Mid County in 1999, consisting of gravity collection and transmission lines serving 1,400 connections.
- CCU acquired the Five Lands WTP in 1998 and decommissioned it in April 2007.
- CCU acquired Aqua-Source Utilities in West County in fall 2000, consisting of the Rotonda WRF and gravity and low-pressure collection systems totaling 3,400 connections.
- The 24-inch transmission main and interconnect from the PRF along Kings Highway to the DeSoto County line was completed in 2001.

- CCU acquired Florida Water Services in Mid County in 2003, consisting of a collection system that serves 3,400 sewer connections in the Deep Creek area.
- CCU acquired Florida Water Services in South County in 2003, consisting of the Burnt Store WRF and WTP and gravity sewer collection systems and pump stations in the Burnt Store area.
- The Rotonda WTP #3 was converted to a WBS in 2005.
- The Rotonda, Gulf Cove, and Golf Course WBSs were upgraded in 2007 with new chemical feed systems.
- A potable water system interconnect was established with the Englewood Water District (EWD) in 2007.
- The Gertrude WBS and GST were decommissioned in 2008.
- The reclaimed water Phase 1 expansion was completed in 2009 and included two strategically placed 0.5-MG storage tanks and pumping stations along with approximately 10 miles of 16-inch-diameter reclaimed water transmission main and 4 miles of 12-inch-diameter reclaimed water transmission main.
- The reclaimed water Phase 2 expansion was completed in 2014, which included approximately 2 miles of 16-inch transmission pipe, additional storage at the West Port WRF in West County, and construction of the West County reclaimed WBS along the interconnect between the reclaimed water systems for the Rotonda and West Port WRFs.
- The reclaimed water Phase 3 expansion was completed in FY 2020. It included Stage 5 Improvements at East Port WRF for a 95-MG reclaimed water storage pond and a 9-million-gallon-per-day (MGD) high-service pump station (HSPS) and installation of three reclaimed water transmission mains (approximately 5.5 miles of 16-inch-diameter main along Placida Road, approximately 1.5 miles of 16-inch-diameter main along Cape Haze Drive, and approximately 1 mile of 12-inch-diameter main along Rotonda Boulevard West).

1.5 Major Events

CCU is an active Charlotte County department with projects and administrative activities underway. The following sections list significant events occurring within FY 2023.

1.5.1 General Operations

- CCU officially began using Cityworks as its asset management system in September 2023.
- CCU implemented new software, called Power DMS, to track training and certifications for personnel.
- CCU implemented a new backflow tracking system called Tokay.
- CCU received American Public Works Association (APWA) accreditation.
- CCU continued to perform damage assessments and repairs on equipment and facilities due to damage from Hurricane Ian.
- CCU was awarded two state legislative appropriation grants.
- CCU began work under the $1,000,000 Florida Commerce Resiliency and Modernization grant.
- CCU was awarded $20 million in Florida Department of Environmental Protection (FDEP) State Revolving Fund (SRF) low-interest loans.
- Raftelis provided the Board of County Commissioners (BCC) with an updated financial forecast with various scenarios for planning criteria on June 20, 2023.

- Blue Cypress Consulting, LLC, completed the CCU Business Process and Manpower Audit and presented their findings at the Utilities Quarterly Update to the BCC meeting on February 21, 2023.
- CCU closed out the Ackerman Design SRF loan and the Loveland Grand Master Lift Station Construction SRF loan. In addition, the final reimbursement was received for the legislative appropriation on the Ackerman Septic-to-Sewer Project.
- CCU presented to the BCC a request to add 17 new staff positions based on the Manpower Study recommendations on July 18, 2023.
- CCU adopted new water, sewer, and reclaimed water utility rates, as increased by the Federal Public Service Commission (FPSC) index on September 12, 2023.

1.5.2 ENGINEERING

- CCU closed out the cost-share agreement for the Notre Dame Utility Improvements Project in South County.

- Major construction activities in FY 2023:

  - Rehabilitation of Lift Station (LS) No. 809 was completed.
  - Construction began on the East Port WRF expansion. Construction is expected to be completed in winter 2025.
  - Rotonda WRF Headworks Rehabilitation – The contract for the Rotonda Headworks Rehabilitation Project was awarded to Poole and Kent.
  - Ackerman Septic-to-Sewer Conversion Project – This project will address water-quality issues by replacing aged septic systems with centralized sewer collection systems. It is partially funded by the State of Florida based on individual property assessments. A vacuum station was installed and is now operational, and Zones 1 and 2 are under construction with the project scheduled to be completed in 2026.
  - SR 776 Force Main Replacement – Construction began on the SR 776 Force Main Replacement Project from Biscayne Drive to Charlotte Sports Park. This in-kind project for the FDEP Consent Order is expected to be completed in FY 2024.
  - Marathon Boulevard Pathway – The project is joined with the Sunset Boulevard E. Sidewalk Project. Construction was completed and Substantial Completion has been obtained, but the project is not yet closed out.
  - Deep Creek Sewer Force Main Replacement Phase 1 – All phases of construction are completed.
  - The Cochran Boulevard Reclaimed Water Main Extension Project –Construction began in late 2022 for installing 3,010 linear feet of 6-inch and 2,850 linear feet of 8-inch reclaimed water distribution main along the right-of-way of Cochran Boulevard from Quesada Avenue to Peachland Boulevard. The project is expected to be completed in FY 2024.

- Major design activities in FY 2023:

  - CCU awarded a work order for the design manual to Kimley-Horn & Associates, but implementation is delayed until 2026.
  - The supervisory control and data acquisition (SCADA) system standards were completed.
  - CCU began contract negotiations with Kimley-Horn & Associates for the Gulf Cove Groundwater Storage Improvements Project.

- CCU awarded a contract to Johnson Engineering for the Babcock Ranch Water Use Permit.
- The Harbor View Road Widening Construction Agreement with the Florida Department of Transportation (FDOT) was finalized, an escrow account was created, and the utility design with FDOT's Design Engineering Firm began.
- The preliminary engineering report for the Lake View Midway Septic-to-Sewer Project was received, and the recommendations were approved by the BCC.
- The design for the Kings Highway Widening Project, which includes utility improvements, was awarded to Johnson Engineering.
- The BCC approved contract negotiations with Weston and Sampson Engineers for the South County Utility Improvements Project.
- CCU awarded a contract to Layne Christensen Co. to perform repairs on Well No. 8 at the Burnt Store RO WTP.
- The West Port Phase I private development project was finalized, which includes installing lift stations, water mains, and sewer mains.
- CCU continued ongoing extensive modeling of the potable water system, sanitary sewer system, and reclaimed water system to reflect changes and growth occurring in the County. Results will be forthcoming in final reports.

1.5.3 Water System Operations

- CCU distributed approximately 4.58 billion gallons of water through the Port Charlotte Water System and approximately 228 million gallons of water through the Burnt Store Water System in FY 2023.
- CCU developed a system-wide free chlorine burn flushing and monitoring plan and achieved system-wide burn for first time.
- The backflow program was delayed until 2026.
- CCU revised staffing requirements at booster stations in accordance with FDEP.
- CCU revised the Lead & Copper Sampling Plan for Burnt Store, in accordance with FDEP, due to population growth.
- CCU participated in an American Water Works Association (AWWA) water audit.
- The Walenda, Gulf Cove, Golf Course, and Rotonda WBSs are undergoing upgrade designs for additional capacity and reliability.

1.5.4 Wastewater System Operations

- CCU continued Federal Emergency Management Agency (FEMA) grant generator installations at lift stations.
- CCU contracted divers to repair slide gates at the Burnt Store WRF.
- CCU continued work on the Capacity, Management, Operation, and Maintenance (CMOM) program, which involved obtaining professional services contracts for a sanitary sewer overflow analysis; the Capacity Assessment and Assurance Program (CAAP) and flow monitoring; and the manhole relining program.
- CCU continued updating the Sewer Ordinance.
- CCU solicited bids for replacing Manhole 2171-Peppercorn.

1.5.5 Reclaimed Water System Operations

- CCU provided irrigation water to golf courses, parks, roadway landscaping, and numerous residential and commercial customers during FY 2023. CCU continues to identify new users and improve operations with a focus on large users.

1.5.6 Instrumentation and Control Group

- CCU provided programmable logic controller (PLC) programming.
- CCU cross-trained between divisions.
- CCU installed and calibrated controls.

1.5.7 Operations Data Management

- CCU Operations staff completed the initial Trihedral VTScada implementation at all plant facilities. Full integration, including migration from Data Flow Systems (DFS) to VTScada, is pending work by the County Information Technology Department. At this time, wastewater treatment facilities and the Burnt Store RO WTP have transitioned to VTScada. Lift Stations and WBSs are pending transition. Completion of this transition is expected to occur within the next few years. Feedback regarding use of VTScada from County staff is generally positive.

1.5.8 Reports and Studies

- The Potable Water Master Plan was finalized by Jones Edmunds in April 2023 and posted to the County website. This report evaluated future water supply needs and identified CIP projects for implementation.
- An O&M Manual for the County's water distribution systems is being finalized by Jones Edmunds.
- CCU is amending the South County portion of the Sewer Master Plan with various consultants as part of the Burnt Store WRF AWT Expansion Project.
- The Reclaimed Water Master Plan is being finalized by Jones Edmunds. This report includes evaluating future reclaimed water supply and demand and identifies CIP projects for implementation.
- CCU continues to work with various consultants to prepare quarterly reports for each WRF and prepare operating permit renewals for the WRFs and deep injection wells.
- A CMOM Report was completed by Kimley-Horn in compliance with new FDEP requirements. A CMOM Program is being developed for the County based on the findings in the report.
- A CAAP Framework Development and Flow Monitoring Report is being completed by Veith Engineering and Hazen and Sawyer. A final report is expected in 2024.
- CCU Operations staff worked with Hazen to update its Pre-Treatment and Fat, Oil, and Grease (FOG) programs and ordinances.
- CCU has developed O&M manuals for all plants, water distribution, wastewater collection, and reclaimed water systems in compliance with the US Environmental Protection Agency (EPA) guidelines. However, maintaining and updating the O&M manuals remains a progressive requirement when new features are introduced or when notable changes to operation occurs.

1.6 ACKNOWLEDGEMENTS

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2 ADMINISTRATION

2.1 COUNTY GOVERNMENT

Charlotte County government operates under an elected BCC and an appointed County Administrator. The BCC is responsible for the legislative duties of the County government. Five County Commissioners representing separate Districts serve on the BCC over staggered 4-year terms.

The County Administrator is the County's chief administrative officer and is responsible for all administrative matters and operations under the BCC's authority. The County Administrator's responsibilities include appointing County Department Directors with final approval by the BCC.

2.2 UTILITIES DEPARTMENT

CCU, a Charlotte County government department, provides potable water production and distribution, wastewater collection and treatment, and reclaimed water distribution for irrigation within their service areas. CCU serves nearly 70,000 homes and businesses in the Greater Port Charlotte area, El Jobean, Gulf Cove, Englewood East, Rotonda, and Burnt Store, as well as bulk customers including El Jobean Water Association, Riverwood Development, Inc., Encore Super Park, and Little Gasparilla Island.

CCU maintains interconnects for emergency bulk water sales with the Charlotte Harbor Water Association, Gasparilla Island Water Association, City of North Port Utilities, and EWD. An interconnect with the City of Punta Gorda allows CCU to provide or receive water depending on each system's demands.

CCU's mission, vision, and values are as follows:

Mission: To provide safe, reliable drinking water, reclaimed water, and wastewater service for the enrichment of the community.

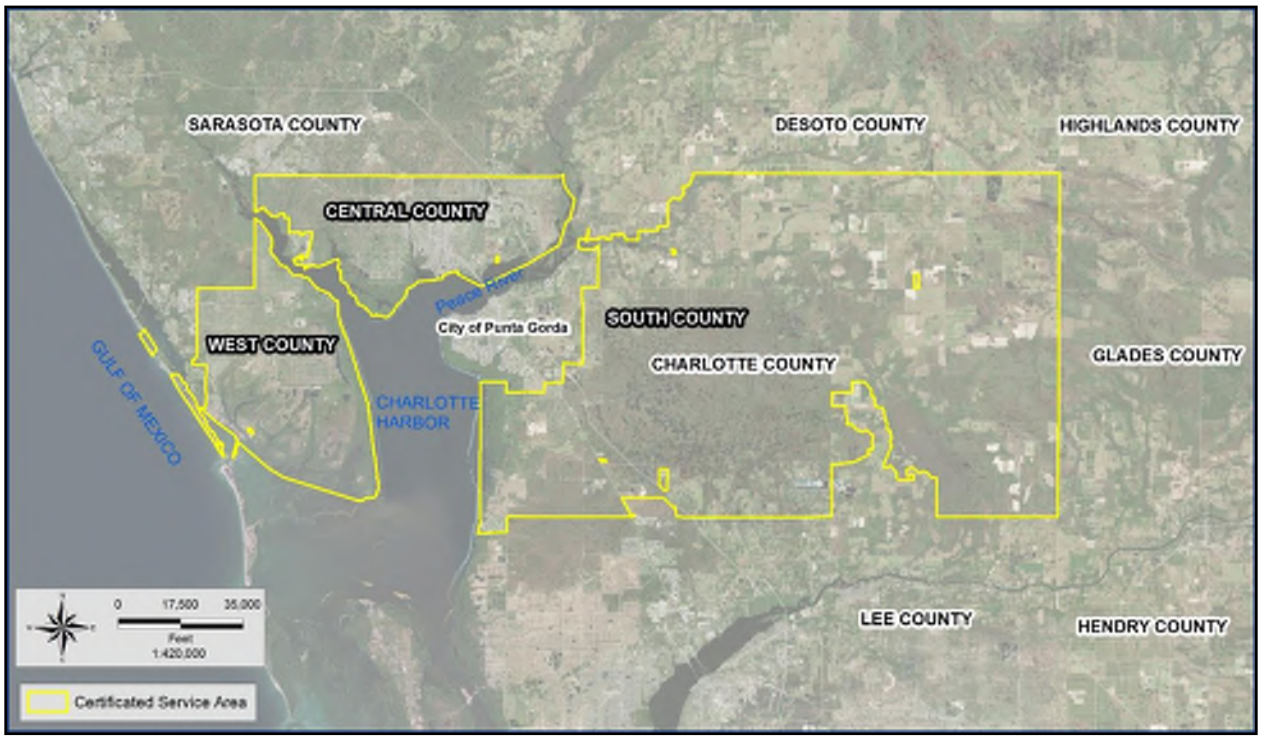
Vision: To enrich our community's quality of life by providing reliable utility services that fulfill future demands.

Values:

- **Committed** – to public and environmental safety as good stewards of what we have been given.
- **Accountable** – to the public through transparency and honesty.
- **Resourceful** – efficiencies through collaboration, teamwork, technology, and defined processes.
- **Energetic** – by providing exemplary service that exceeds our community's expectations.
- **Supportive** – by striving to meet the needs of the public and our environment.

Figure 2-1 shows the CCU service areas outlined in yellow.

Figure 2-1 CCU Service Areas



CCU is led by a Utilities Director, who works under the direction of the County Administrator and Deputy County Administrator. CCU consists of four divisions: Administration, Business Services, Engineering Services, and Operations.

The Administration Division includes the Utilities Director and support staff and manages the overall utility and supervises all other utility divisions. Specific duties of the Administration Division include Utilities Department budget oversight, Grants Management, Asset Management, and Warehouse and Administrative Support Services.

The Director's responsibilities include:

- Planning for water and wastewater needs.
- Developing potable water treatment/distribution systems.
- Developing wastewater treatment/collection systems.
- Developing reclaimed water distribution systems.
- Operating the County's water, wastewater, and reclaimed water systems.
- Instituting water conservation practices and educational programs.
- Communicating – internally and externally with customers.

The Business Services Division is managed by the Business Services Manager and includes:

- Customer Service.
- Billing and Collections.
- Meter Services.

The Engineering Services Division provides engineering and construction observation services to residential and commercial utility customers. The Division is managed by the Engineering Services Manager and includes:

- Preliminary Engineering Group.
- Design Group.
- Construction Services Group.

The Operations Division, overseen by the Utility Operations Manager, is responsible for the O&M of all County-owned and -operated water, wastewater, and reclaimed water facilities including:

- Water and wastewater treatment facilities.
- Water distribution systems including booster pumping stations, storage tanks, fire hydrants, valves, and the entire water distribution piping.
- Wastewater collections including lift stations and vacuum stations, low-pressure sewer, gravity sewer, vacuum sewer, and force main piping systems.
- Reclaimed water distribution systems including cross-connection control and water-quality monitoring.
- An Instrumentation and Controls (I&C) Group, under a supervisor, formed from existing I&C technicians in each division.

Financial services are supplied by the Fiscal Services Division of the Charlotte County Budget & Administrative Services Department. CCU pays for five personnel, led by a Financial Manager, through an inter-fund transfer.

CCU also funds two positions in the County Information Technology Department to assist with upgrading and maintaining hardware and software systems.

At the start of 2024, the total number of positions budgeted for CCU was 279, with 250 positions filled by full-time employees.

Figure 2-2 and Figure 2-3 show the CCU organizational structure at the beginning of FY 2024 (January 2024).

2.3 Administration Facilities

The Charlotte County Environmental Campus is on an outparcel of the East Port WRF. The campus includes the CCU Administration Building, Operations Service Center/Warehouse, Charlotte County Public Works Solid Waste Division, Community Services, University of Florida Institute of Food and Agricultural Services (UF/IFAS) Extension Services Division, the Charlotte County/Punta Gorda Municipal Planning Organization, and Public Works Mosquito and Aquatic Weed Control.

Figure 2-2 January 2024 CCU Organizational Chart – Overall

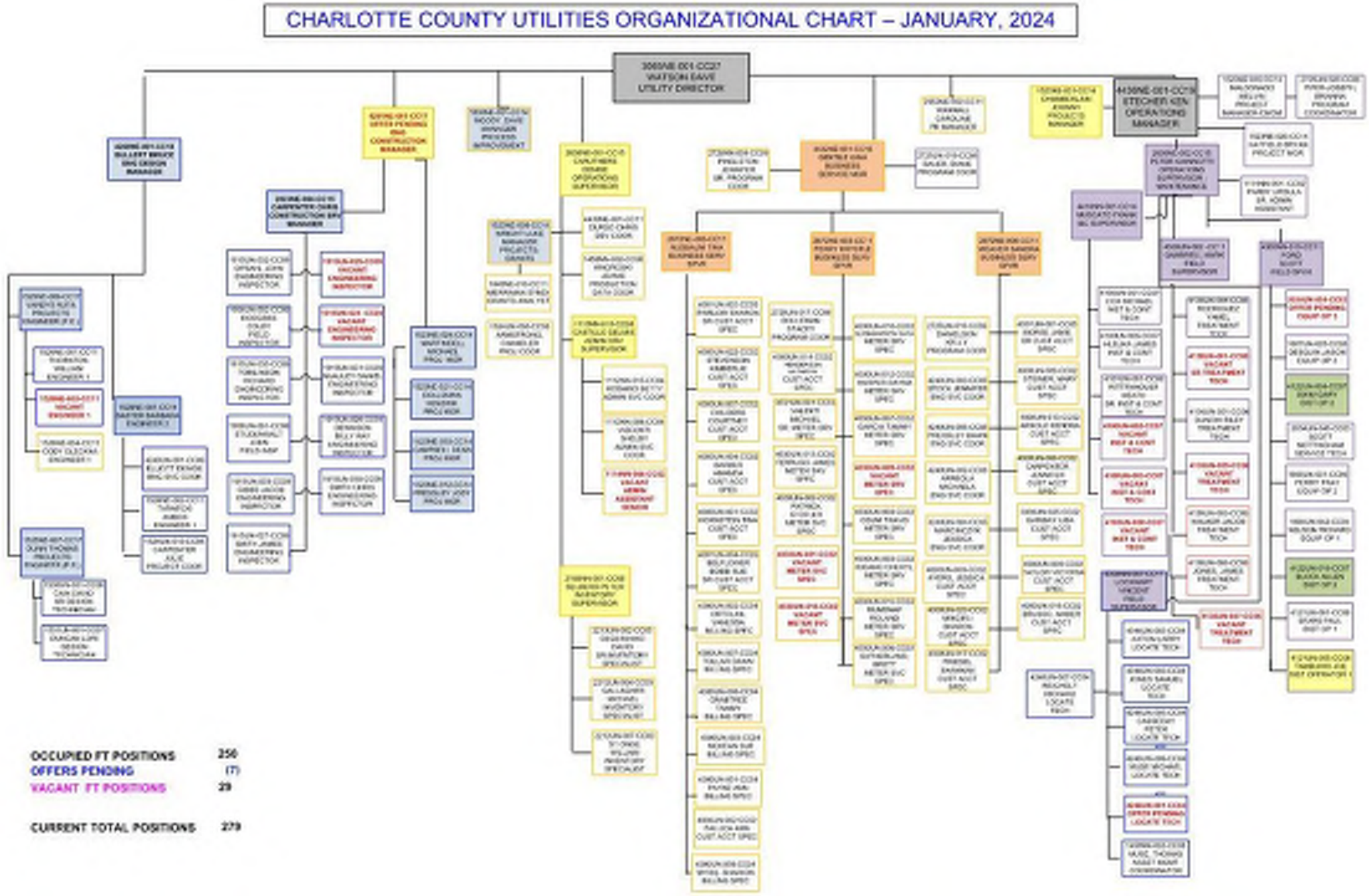
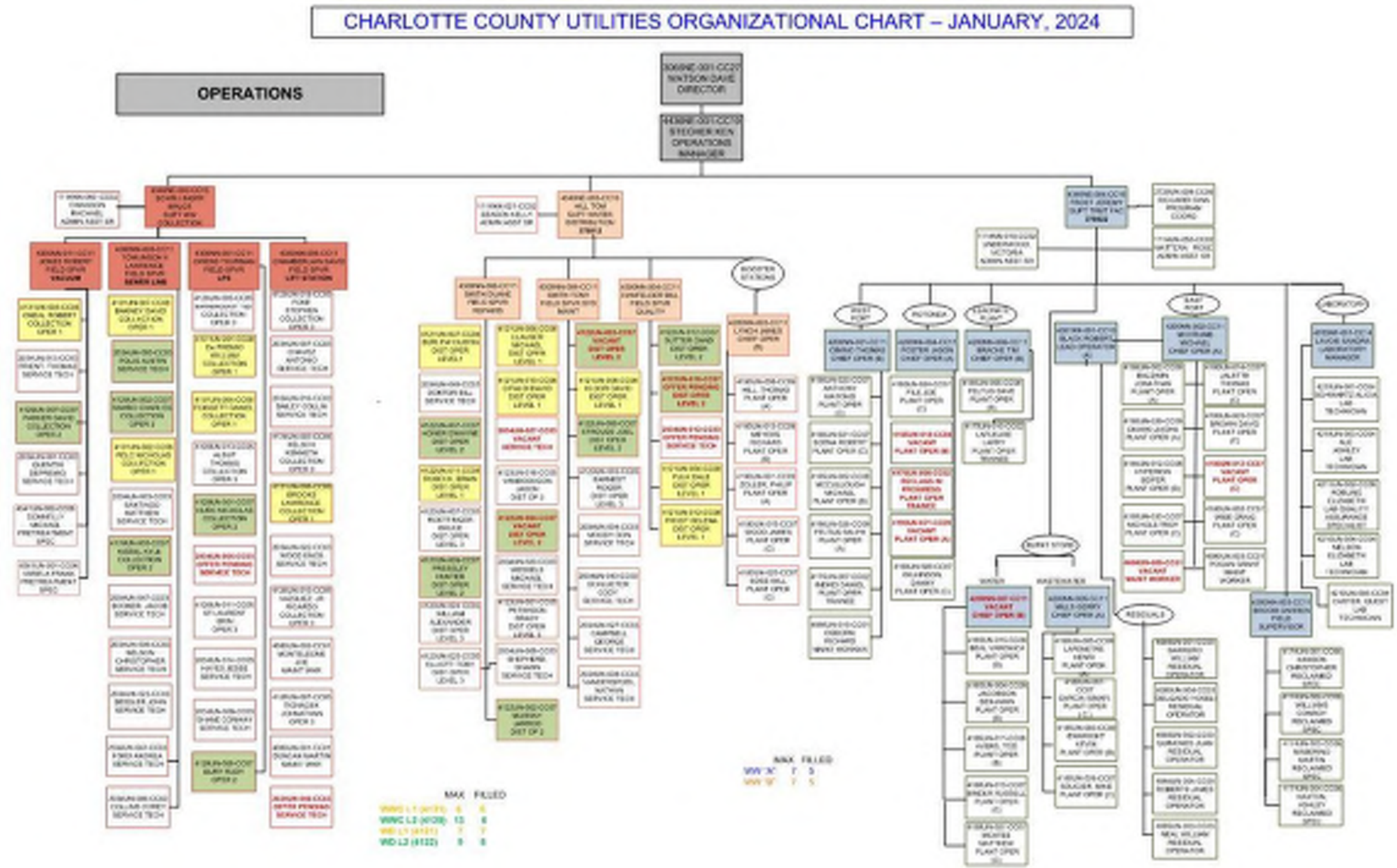


Figure 2-3 January 2024 CCU Organizational Chart – Operations



2.4 CCU WATER CONSERVATION EFFORTS

In FY 2023, CCU continued with its outreach efforts, including oversight of the Water Conservation Programs and community education efforts discussed in the following sections.

2.4.1 WATERING RESTRICTIONS

For the portion of Charlotte County where CCU provides service, Charlotte County follows current Southwest Florida Water Management District (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 the South Florida Water Management District (SFWMD) Conservation Measures as posted on their website *https://www.sfwmd.gov/community-residents/landscape-irrigation*.

2.4.2 IN-HOUSE ENFORCEMENT OF WATERING RESTRICTIONS

The BCC approved enforcement of watering restrictions in early 2008. 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. These charges appear on the customer's water bills. The Sheriff's Office continues to provide enforcement services for non-CCU customers.

2.4.3 WATER RESTRICTIONS ORDINANCE

On November 24, 2020, the BCC adopted Ordinance #2020-045 modifying the existing ordinance to comply with year-round SWFWMD water conservations and to add water shortage plan provisions distinguishing between water management districts in Charlotte County. The details of the watering restrictions are contained at *https://www.charlottecountyfl.gov/departments/utilities/about-utilities/conservation/water-restriction.stml.*

2.4.4 CONSERVATION-BASED RATE TIERS

CCU uses a five-tier 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.

2.4.5 RECLAIMED WATER USE AND EXPANSION

Another method for conserving water supplies is to encourage the use of reclaimed water. Using reclaimed water for irrigation and other non-potable water needs reduces the demand for potable water, surface water, and groundwater. CCU started its reuse program on August 16, 1994, when the first customer was signed to the East Port Water WRF. The County's other wastewater treatment facilities were eventually upgraded to provide reclaimed water to meet customer demands in other parts of the County. In 2005, CCU began designing a customer-based reclaimed water transmission system rather than a WRF service-area-based system. Preliminary design began with preparing a computerized hydraulic model.

The goal of the modeling effort was to identify the infrastructure needed to connect the three WRFs in Mid and West County areas into one reclaimed water transmission system and to serve as many customers as economically possible. Today, CCU has two reclaimed water systems – one serves the Mid and West County areas, and one serves the South County area. CCU's Port Charlotte public water system (PWS) operates under a Master Reuse Permit

approved by FDEP that allows CCU to move reclaimed water from East Port WRF, West Port WRF, and Rotonda WRF to customers. Abundant reclaimed water at the East Port WRF and customer demands for irrigation water throughout the central and west parts of the County were the driving forces behind CCU's desire to expand its reclaimed water distribution system. Today, the Master Reuse System (MRS) is kept fully pressurized to allow customers to withdraw reclaimed water when needed.

Over the years, the hydraulic model continued to be improved and used as a tool to expand the reuse system throughout the County. In January 2020, a Technical Memorandum completed by Jones Edmunds documented the updates to the CCU reclaimed water hydraulic model, model verification, current operations, and analyses and recommendations for reclaimed water system improvements to maximize conveyance of reclaimed water to existing and future customers. CCU and Jones Edmunds have continued this effort and have developed the CCU Reclaimed Water Master Plan to prioritize CIP projects for the reclaimed water systems.

2.4.6 COMMUNITY OUTREACH

CCU regularly participates in water conservation-related outreach including bill inserts, news articles, and speaking engagements within the community. CCU funded a portion of the salary for a Florida Yards and Neighborhoods Charlotte County UF/IFAS Extension Program Assistant for the past several years. CCU and UF/IFAS Extension Services work jointly to promote Florida-Friendly Landscaping. A donated demonstration garden on CCU's Environmental Campus property is accessible to all Charlotte County residents and is maintained by Master Gardeners who are given free space at the Campus to better educate residents.

CCU conducts citizen educational tours at the Burnt Store Reverse Osmosis (RO) WTP and CCU's four WRFs. The purpose of the tours is to promote alternative water sources, water conservation, and good stewardship of water resources.

The water/wastewater plant tours included:

- Water/Wastewater Treatment Processes.
- Regulatory Requirements.
- State-of-the-Art Membrane Bioreactor (MBR) and RO Technology.
- Process for Producing Reclaimed Water.
- Treatment and Disposal of Effluent.
- Biosolids and their Disposal.
- Environmental Impacts of Water Reclamation.
- Alternative Water Sources.

CCU promotes an understanding of its operations through outreach programs such as:

- Presentation of the Utility for County Ambassador Program.
- Presentation of the Utility for Leadership Charlotte.
- Utility booth at Community Outreach Event.
- Utility project and program presentations to Charlotte County Realtors.
- Imagine a Day Without Water.
- Speaking engagements at Homeowner Association (HOA) meetings.

- Presentations and speaking engagements at local schools.
- Participation at Government Academy Day.
- Project information meetings for residents and business owners.

2.4.7 Water Conservation Month

CCU's annual Water Conservation Month program includes a BCC proclamation with community outreach/educational displays at various community events.

2.4.8 CCU Website/Social Media

Customers can access information on the latest water restrictions, conservation tips, and general CCU current events at the Charlotte County website, *www.charlottecountyfl.gov,* and at the Administration office. The public can also receive updated information on projects, services, conservation tips, hydration information, and general current events with pictures on Facebook. Facebook also provides an avenue to announce public outreach events and educational tours and to make reservations online to attend events and tours.

2.5 Financial

CCU is a government-owned enterprise fully funded by customer rates, not by tax dollars. Savings opportunities (or profits) are passed through to the benefit of the utility customers. CCU's policies, rates, and security deposits are established by the BCC. The County Clerk of Circuit Court serves as the accountant and auditor for the BCC and is responsible for the collection and disbursement of County funds.

2.5.1 Revenues

A rate study was completed in FY 2023. The BCC subsequently approved a one-time rate increase for water, sewer, and reclaimed water under Ordinance 2023-156. Rates were increased by 7.07 percent effective October 2023.

The HeartShip Program is available to help customers who are faced with a period of personal or family crisis and do not have sufficient money to pay their utility bill. This program is funded by contributions from caring members of the community. The County's Human Services Department, in cooperation with CCU's Business Services Division, administers the HeartShip funds.

The total O&M revenue for FY 2023 water and wastewater services was $94,152,515. The total O&M connection charge revenue was $7,798,205, and the total connection fee revenue was $14,216,339.

2.5.2 CCU Customer Base

During FY 2023, the number of active water services increased from 66,734 to 69,113, and the number of active sewer services increased from 43,932 to 46,037. For planning purposes, the level of water and wastewater service established by CCU is 225 gallons per day (gpd) of water consumption per equivalent residential unit (ERU) and 190 gpd of wastewater flow per ERU. These levels, as established by the Charlotte County 2050 Comprehensive Plan, represent maximum daily usage plus fire flow.

2.5.3 INSURANCE

CCU is self-insured. The self-insurance is provided by the County and is administered by the Gehring Group, with Kurt Gehring acting as the Agent of Record. CCU is also covered by general property and liability insurance, excess property insurance, boiler and machinery insurance, and pollution liability insurance. Utility buildings and contents are covered for up to 100 percent of the replacement cost without depreciation. In Mr. Gehring's opinion, the insurance coverage is adequate for CCU and its facilities. Therefore, the County complies with the bond covenant property insurance requirements as set forth below:

> *Insurance – The Issuer will carry such insurance as is ordinarily carried by private or public corporations owning and operating utilities similar to the System with a reputable insurance carrier or carriers, including public and product liability insurance in such amounts as the Issuer shall determine to be sufficient and such other insurance against loss or damage by fire, explosion (including underground explosion), hurricane, tornado or other hazards and risks, and said property loss or damage insurance shall at all times be in an amount or amounts equal to the fair appraisal value of the buildings, properties, furniture, fixtures and equipment of the System, or such other amount or amounts as the Consulting Engineers shall approve as sufficient.*
>
> *The Issuer may establish certain minimum levels of insurance for which the Issuer may self-insure. Such minimum levels of insurance shall be in amounts as recommended in writing by an insurance consultant who has a favorable reputation and experience and is qualified to survey risks and to recommend insurance coverage for persons engaged in operations similar to the System.*
>
> *The Issuer shall, immediately upon receipt, deposit the proceeds from property loss and casualty insurance to the credit of the Revenue Fund. The proceeds from property loss and casualty insurance shall be applied as follows: (A) if such proceeds, together with other available funds of the Issuer, are sufficient to repair or replace the damaged portion of the System, such proceeds and other available funds shall be deposited to the credit of the Renewal and Replacement Funds and, together with any other available funds of the Issuer, applied to such repair or replacement; or (B) if such proceeds, together with other available funds of the Issuer, are not sufficient to repair or replace the damaged portion of the System or if the Issuer makes a determination in accordance with Section 5.07 hereof that such portion of the System is no longer necessary or useful in the operation of the System, such proceeds shall (1) if such proceeds equal or exceed $50,000, (a) be applied to the redemption or purchase of Bonds or (b) be deposited in irrevocable trust for the payment of Bonds in the manner set forth in Section 9.01, provided the Issuer has received an opinion of Bond Counsel to the effect that such deposit shall not adversely affect the exclusion, if any, from gross income of interest on the Bonds for purposes of federal income taxation, or (2) if such proceeds are less than $50,000, be deposited in the Revenue Fund.*

2.6 RATE COMPARISON

The County investigated the rates and rate structure for various neighboring utility systems that provide residential services. The results of this comparison as of March 2024 assume that water service consists of delivering 4,000 gallons of water per month through a standard (3/4-inch) meter and that sewer service flows correspond with 4,000 gallons of water per month. Table 2-1 presents the rate comparison results.

Table 2-1 Rate Comparison

Utility Systems	Water Charge ($)	Wastewater Charge ($)	Combined Charges ($)
CCU:			
Rates as of April 2023	54.14	71.98	126.12
Other Neighboring Utilities:			
City of Arcadia (outside City)	57.64	65.38	123.02
City of Marco Island (outside City)	53.92	52.48	106.4
Desoto County	59.23	49.30	108.53
City of Fort Myers (outside City)	50.34	76.36	126.7
City of North Port (outside City)	50.99	74.79	125.78
FGUA – North Fort Myers	54.35	58.94	113.29
City of Venice	55.19	60.27	115.46
City of Marco Island (inside City)	53.92	52.48	106.4
FGUA – Lake Fairways and Pine Lakes	54.35	58.94	113.29
City of North Port (inside City)	44.32	71.98	116.3
City of Fort Myers (inside City)	31.59	78.04	109.63
FGUA – Lehigh Acres	42.61	69.01	111.62
St. Lucie County Utilities	52.15	65.04	117.19
Collier County	46.36	71.76	118.12
City of Arcadia (inside City)	38.44	43.57	82.01
Okeechobee Utility Authority	47.32	61.70	109.02
City of Cape Coral	34.43	61.61	96.04
City of Punta Gorda (outside City)	46.51	47.90	94.41
City of Sarasota (inside City)	35.90	59.17	95.07
City of Sarasota (outside City)	44.33	72.25	116.58
City of Naples (outside City)	21.28	89.70	110.98
Sarasota County	31.94	63.89	95.83
City of Clearwater	37.36	48.80	86.16
Bonita Springs Utility	26.10	50.70	76.8
Lee County	27.72	47.32	75.04
Englewood Water District	31.19	46.36	77.55
Hillsborough County	33.25	33.25	66.5
Pinellas County	23.37	40.06	63.43

Utility Systems	Water Charge ($)	Wastewater Charge ($)	Combined Charges ($)
Manatee County	21.05	48.43	69.48
City of Bradenton	32.18	36.86	69.04
City of Punta Gorda (inside City)	26.65	38.33	64.98
City of Naples (inside City)	17.02	44.69	61.71

Note: The reflected residential rates were in effect December 2023, are exclusive of taxes or franchise fees if any, and reflect rates charged for inside the service, unless otherwise noted.

2.7 Large Water Users

Table 2-2 and Table 2-3 list the 10 largest water consumers in FY 2023 for the Port Charlotte and Burnt Store PWSs, respectively. The values presented are totals for FY 2023.

Table 2-2 CCU Port Charlotte PWS Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)
Riverwood Development, Inc.	68,341
Shorepoint Health – Port Charlotte	26,677
HCA Florida Fawcett Hospital	26,675
El Jobean Water Association	24,511
Florida Power & Light	16,520
Homeowners of Port Charlotte Village	14,897
Little Gasparilla Water Utility, Inc.	12,741
Encore Super Park – Port Charlotte	11,433
Gasparilla Island Water Association	8,868
South Port Square	8,472
Total	**219,135**

Table 2-3 CCU Burnt Store PWS Large Water Users

Water Customer	Total Water Purchased (thousands of gallons)
The City of Cape Coral	6,936
SHM Burnt Store, LLC	5,223
IH6 Property Florida L.P.	3,662
Grande Isle Towers III & IV Condo Association, Inc.	3,558
Florida Design Communities	3,045
Grand Isle Towers I & II Condo Association, Inc.	2,843
Heritage Landing Master	2,478
Keel Club Condo Association, Inc.	1,615
Acapulco Gardens, LLC.	1,508
Vista Del Sol at Burnt Store Marina Condo	1,455
Total 10 Largest Users	**32,323**

2.8 PLANNING RECOMMENDATIONS

Table 2-4 through Table 2-7 summarize the general planning recommendations for CCU's continued operations of the utilities systems.

Table 2-4 Administration Planning Recommendations

Recommendation:	Continue CCU's vision to ensure safe, reliable utility services at fair and reasonable rates.
Recommendation:	Continue developing and updating standards for water and sewer construction to ensure the most effective use of CIP funds.
Recommendation:	Continue developing options for water, sewer, and reclaimed water service in the County to meet the growing demand for municipal utility services.
Recommendation:	Continue developing the Utilities' Information System functions to update/replace software and computer equipment to increase operating efficiencies and cost savings.
Recommendation:	Continue to explore regional solutions to water and wastewater service needs for the mutual benefit of Charlotte County and the adjoining counties and cities.
Recommendation:	Continue to document planned and proposed developments to assist with future planning.
Recommendation:	Continue to pursue FEMA funding for rehabilitation of utility assets damaged by Hurricane Ian.
Recommendation:	Continue to evaluate the feasibility of rehabilitating the damaged Administration Building.
Recommendation:	Develop/update the Business Continuity Plan.[1]
Recommendation:	Become a member of an intrastate mutual aid and assistance program.[1]
Recommendation:	Remove USB port slots from selected desktops to limit the vulnerability of the SCADA system.[1]
Recommendation:	Develop a cybersecurity culture through training and internal programs.[1]
Recommendation:	Require equipment vendors for HMI, field controllers, field devices, etc., and software suppliers for data management to provide information on cybersecurity and updates for their products.[1]

[1] Recommendation from the RRA Report (March 2020).

Table 2-5 Water System Planning Recommendations

Recommendation:	Continue to update the water system hydraulic computer models and use them as planning tools for future water system improvements.
Recommendation:	Continue the AMI Water Meter Replacement Program.
Recommendation:	Continue to integrate acquired utilities into the overall CCU water system to maximize reliability and reduce costs to CCU customers.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps to improve water distribution to customers.
Recommendation:	Continue to develop and update water quality models for each distribution system for use in ongoing development reviews.

Recommendation:	Develop a systemwide hydrant flushing program.
Recommendation:	Develop a program to identify and track asbestos and lead pipe.
Recommendation:	Develop a systemwide valve exercise program.
Recommendation:	Develop a best management practice plan to standardize pump and motor sizing across CCU pumping facilities to better facilitate maintenance and replacement of equipment.
Recommendation:	Develop an equipment calibration program for purposes of tracking and calibrating water system analyzers, flow meters, and applicable devices.

Table 2-6 Wastewater System Planning Recommendations

Recommendation:	Use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Recommendation:	Continue to televise and smoke test gravity sewers to locate source(s) of inflow and infiltration (I/I). Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Recommendation:	Continue construction and plan for the next phases of sewer expansion in the Port Charlotte area in accordance with the 2017 Sewer Master Plan and 2024 Sewer Master Plan Update.
Recommendation:	Evaluate the need for technical support from the software company or from the County's IT group with hours set aside to work exclusively on data transfer and report set-up and implementation to expand and optimize the LIMS capabilities.
Recommendation:	Evaluate cost-effective disposal alternatives for dewatered biosolids other than transporting to Synagro and the landfill as part of the plant upgrade.
Recommendation:	Develop an equipment calibration program for purposes of tracking and calibrating wastewater system analyzers, flow meters, and applicable devices.
Recommendation:	Complete recommendations from CCU's capacity, management, operations, and maintenance (CMOM) program.
Recommendation:	Continue to evaluate system capacity and impacts of I/I using recommended tools from the Capacity Assessment and Assurance (CAAP) Program Framework Development and Flow Monitoring Program.

Table 2-7 Reclaimed Water System Planning Recommendations

Recommendation:	Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Recommendation:	Evaluate improvements of pumping and transmission capacity to convey excess reclaimed water supply from Mid County to West County as recommended in the Reclaimed Water Master Plan.
Recommendation:	Maintain updated hydraulic models for the MRS and Burnt Store system to predict the impact of future demand on the reclaimed water transmission system.

Recommendation:	Develop and complete a community survey to better determine potential reclaimed water customers. Results of the study can be used to determine economic feasibility of water delivery.
Recommendation:	Continue to develop and host public education events to educate the community on the benefits of reclaimed water.
Recommendation:	For areas with limited-to-no reclaimed water service but multiple new large developments, evaluate opportunities to expand the reclaimed water transmission systems with assistance from new developers.
Recommendation:	Complete a potable reuse feasibility study.
Recommendation:	Develop an equipment calibration program for purposes of tracking and calibrating reclaimed water system analyzers, flow meters, and applicable devices.

3 WATER TREATMENT PLANTS

CCU has two water supply sources for its two independent PWSs. The mid and west parts of Charlotte County are provided with treated surface water from the PRF. The water is purchased from the Peace River Manasota Regional Water Supply Authority (Authority) under a multi-county water supply agreement and conveyed to the County via transmission mains. The south area of Charlotte County (South County) is supplied by treated groundwater from the CCU-owned Burnt Store RO WTP. Figure 3-1 shows the Burnt Store RO WTP, the Authority supply interconnects, and water service areas. This Chapter presents an overview of the Authority water supply and a detailed assessment of the County-owned Burnt Store RO WTP.

3.1 PEACE RIVER MANASOTA REGIONAL WATER SUPPLY FACILITY

Charlotte, DeSoto, Manatee, Hardee, and Sarasota Counties created the Authority through an agreement on February 26, 1982. Hardee County ceased to be a member the following year. The initial term of the agreement was 35 years, renewable for an equal consecutive term; a new Master Water Supply Contract was executed in 2005 with amendments in 2008 and 2015 by the four members and one customer – the City of North Port.

The PRF is the sole water treatment plant owned and operated by the Authority. The facility is on the Peace River in DeSoto County approximately 4 miles northeast of Charlotte County. The PRF treats source water from the Peace River via conventional surface water treatment consisting of coagulation, flocculation, sedimentation, filtration, and disinfection. The Authority uses this five-step process to remove organics, color, and turbidity while inactivating bacteria that may be present in the source water. The Authority distributes treated water to member customers using high-pressure pumps and transmission mains.

The PRF has a maximum capacity of 51.0 MGD, but due to resiliency, reliability, and other factors, the current water supply available for allocating to Authority members is capped at 34.7 MGD annual average daily flow (AADF) until a plant expansion occurs. Charlotte County's contracted water supply allocation from the Authority is 16.1 MGD AADF, 19.320 MGD for the peak monthly average day, and 22.54 MGD for the maximum day.

In FY 2023, the Authority supplied CCU with approximately 4,468 MG, or 12.2 MGD AADF.

The Authority is determining regional future water supply needs among its members and plans to expand water treatment capabilities accordingly. Investing members will be contracted additional water supply allocation proportional to their financial contribution.

3.1 BURNT STORE RO WTP

The Burnt Store PWS is served by the Burnt Store RO WTP (PWS ID6080318) at 17430 Burnt Store Road in Punta Gorda. CCU owns and operates the WTP, which has a permitted treatment capacity of 3.61 MGD. Figure 3-2 shows the Burnt Store RO WTP process flow diagram, which is described in this section.

Figure 3-1

CCU Potable Water Systems

Legend

CCU Water Service Areas
- Burnt Store PWS
- Port Charlotte PWS (Consecutive System to PRMRWSA)

CCU
- Burnt Store WTP
- Water Booster Station
- Emergency Interconnect
- Consecutive System Interconnects

Water Mains
- 2 inch
- 4 inch
- 6 inch
- 8 inch
- 10 inch
- 12 inch
- 14 inch
- 16 inch
- 18 inch
- 20 inch
- 24 inch

Peace River Manatosa Regional Water Supply Authority (Authority)
- Peace River Facility (PRF)
- Authority RTS Interconnect
- Authority Regional Transmission System (RTS)

Note:

1. Authority infrastructure limited for clarity

2. Authority provides all finished water to the Port Charlotte PWS. CCU then provides a portion of that finished water to Riverwood, Super Encore Park, and El Jobean Water Association PWS's

N W E S

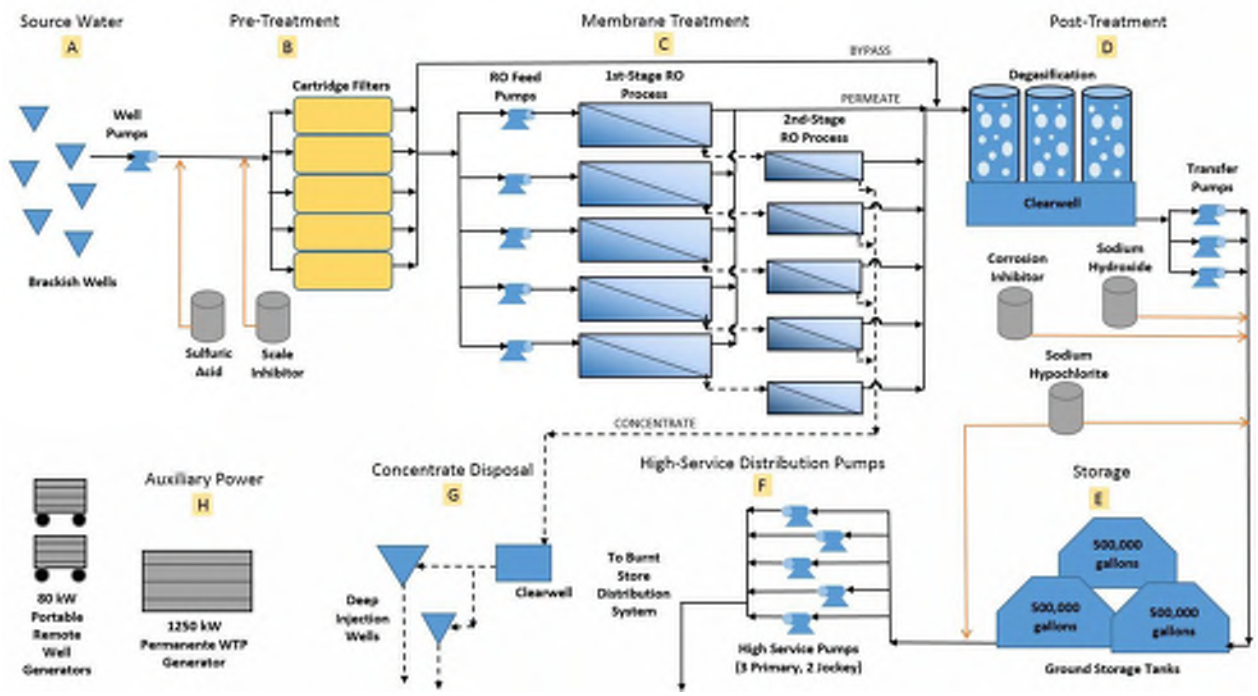
0 6,500 13,000

Feet

1:168,000

JonesEdmunds

Figure 3-2 Burnt Store RO WTP Process Flow Diagram



The Burnt Store RO WTP draws groundwater from seven production wells. Raw water is dosed with a pH adjuster (sulfuric acid) and a phosphorus-free scale inhibitor (A-111 Plus by American Water Chemicals) while being pumped to the RO process room to prevent membrane scaling during the RO treatment process. Downstream of the chemical injection, the pH-adjusted raw water passes through cartridge filters to remove common small particles present in the raw water sources. After the cartridge filters, the RO feed water passes through high-pressure RO feed pumps before entering the RO treatment trains.

The RO process separates dissolved solids from the water by forcing the water through a semi-permeable membrane. The process requires a pressure of 120 to 160 pounds per square inch (psi) and results in two streams. The RO membranes produce a treated water (permeate) and a byproduct waste stream (concentrate). The permeate is then blended with approximately 10-percent raw water bypass for stabilization before post-treatment. Burnt Store uses a two-stage process to increase the water recovery of the system by processing the concentrate of the first stage through a second stage of membranes. The remaining concentrate is disposed of via on-site deep well injection.

During post-treatment, the permeate is conveyed through packed tower degasifiers for hydrogen sulfide removal. After degasification, sodium hydroxide is added for pH adjustment, followed by a zinc-orthophosphate-based corrosion inhibitor (A-731 by American Water Chemicals) and sodium hypochlorite for disinfection. The finished water is typically stored in GSTs before refinement of the disinfectant residual and distribution via high-service pumps (HSPs).

The Burnt Store RO WTP process consists of the following components:

- A) Source Water – Burnt Store Wellfield
  - Seven Groundwater Wells with Submersible Pumps
  - Twelve Monitoring Wells
- B) Pre-Treatment Process
  - Sulfuric Acid Chemical Feed System
  - Phosphorus-Free Scale Inhibitor Chemical Feed System
  - Five Cartridge Filter Vessels
- C) Membrane Treatment Process
  - Five RO High-Pressure Feed Pumps
  - Two 2-Stage RO Trains (500,000-gpd capacity each)
  - Three 2-Stage RO Trains (750,000-gpd capacity each)
- D) Post-Treatment Process
  - Sodium Hypochlorite Chemical Feed System
  - Sodium Hydroxide Chemical Feed System
  - Zinc-Orthophosphate-Based Corrosion Inhibitor Chemical Feed System
  - Control Valve for Blended Raw Water
  - Three Packed Tower Degasification Units
  - Three Transfer Pumps

- E) Storage
  - Three 500,000-gallon Finished-Water GSTs
- F) Distribution HSPs
  - Four 125-horsepower (HP) HSPs (1,400 gpm)
  - Two 25-HP Jockey Pumps
- G) Concentrate Disposal
  - Two Deep Injection Wells with a Total Capacity of 3.44 MGD
  - One Dual-Level Deep Monitoring Well
- H) Auxiliary Power
  - One 1,250-kilowatt (kW) Generator (serving the original RO Process Building, RO Process Building, Operations Building, and three on-site groundwater wells)
  - Two 80-kW Portable Generators (serving four remote groundwater wells)

3.1.1 Regulatory Considerations

The Burnt Store RO WTP is a Category II, Plant Class B, community PWS. The permit schedule includes:

- SWFWMD Water Use Permit (WUP) issued on September 25, 2013, and expires on September 25, 2033.

- FDEP – Deep Injection Well IW-1 (Underground Injection Control [UIC] Permit No.: 0271367-007-UO/1I) was issued on May 14, 2019, and expires on May 14, 2024. According to Chapter 62-4.090, Florida Administrative Code (FAC), a permit renewal application was submitted on January 26, 2024, and is pending approval by FDEP (application number 0271367-009-UO).
- FDEP – Deep Injection Well IW-2 (UIC Permit No.: 0271367-008-UO/1X) was issued on August 18, 2022, and expires August 18, 2027.

3.1.1.1 Water-Quality Monitoring

As required by federal and state regulations for all utilities, CCU routinely and continuously monitors the quality of the raw water and finished water produced at the Burnt Store RO WTP. Monitoring wells are sampled quarterly, and the samples are sent to the CCU laboratory at the East Port WRF. Water-quality data from the production and monitoring wells are reported to SWFWMD and stored on the CCU Cityworks Enterprise Asset Management System (EAMS). In addition to meeting regulations, CCU uses water-quality parameters to assess the performance of the WTP and to determine maintenance events.

Table 3-1 shows the Burnt Store RO WTP finished water quality for FY 2023 on an average monthly basis. Additional water quality data are found in the Consumer Confidence Reports (CCRs) discussed in Chapter 4.

Table 3-1 Burnt Store RO WTP Finished Water Quality for FY 2023

Month	pH (s.u.)*	TDS (mg/L)*	Cond. (µS/cm)*	Free Chlorine (mg/L)*	Alkalinity (mg/L)*	Total Hardness (mg/L)*	Remote Sample pH (s.u.)	Remote Sample Free Chlorine (mg/L)
Oct-22	7.78	287	591	1.56	NA	NA	7.80	1.42
Nov-22	7.87	283	612	1.47	NA	NA	7.85	1.35
Dec-22	7.75	274	612	1.55	NA	NA	7.74	1.42
Jan-23	7.71	279	603	1.27	19	103	7.72	1.18
Feb-23	7.77	279	602	1.45	21	83	7.79	1.45
Mar-23	7.76	277	602	1.37	28	94	7.80	1.25
Apr-23	7.72	280	594	1.34	31	90	7.77	1.21
May-23	7.73	285	611	1.13	25	91	7.81	1.00
Jun-23	7.77	290	621	1.43	13	85	7.76	1.31
Jul-23	7.78	290	619	1.36	24	90	7.77	1.24
Aug-23	7.81	287	614	1.40**	29	108	7.83	1.29
Sep-23	7.71	289	617	1.36	25	104	7.79	1.19
Annual Avg.	**7.76**	**283**	**608**	**1.39**	**24**	**94**	**7.79**	**1.28**

Notes: * GST Sample Location; ** Adjusted for outliers; mg/L = milligrams per liter; NA = Not Available; TDS = Total Dissolved Solids; µS/cm = micro-Siemens per centimeter; s.u. = standard units.

3.1.1.2 Production Wells and Treatment Capacity

The Burnt Store Wellfield is permitted to withdraw groundwater as source water for treatment at the Burnt Store RO WTP. Table 3-2 shows the permitted wellfield information as noted in the active SWFWMD WUP No. 3522.013, including well capacities. Permitted well production based on the currently active wells RO-7, RO-8, RO-9, RO-11, RO-12, RO-16, and the newly rehabilitated RO-15, is approximately 1.86 MGD AADF and 2.45 MGD peak monthly flow (PMF). Note the wellfield is expandable to approximately 3.17 MGD AADF and 4.12 MGD PMF under the existing permit.

Table 3-2 Burnt Store RO WTP Current and Future Production Wells

Well ID	Diameter (inches)	Depth Total/Cased (feet-bls)	Permit Limit, Average (gpd)	Permit Limit, Peak Month (gpd)
RO-7	8	596/300	200,000	272,000
RO-8	8	595/304	200,000	272,000
RO-9	8	602/550	200,000	272,000
RO-11	12	650/526	367,500	471,700
RO-12	12	470/412	367,500	471,700
RO-14*	12	650/300	327,400	417,300
RO-15	12	909/800	200,000	272,000
RO-16	12	611/320	327,400	417,400
RO-17*	12	650/450	327,500	417,300
RO-18*	12	650/450	327,400	417,300
RO-19*	12	650/450	327,400	417,300
		Total	**3,172,000**	**4,118,000**

Notes: * Future wells; bls = below land surface.

The permitted maximum day operating capacity of the WTP is 3.61 MGD. Table 3-3 and

Table 3-4 show the total and average monthly water flows, respectively. The tables summarize the amount of water that bypassed the RO process to be blended with permeate for stabilization, produced from the WTP, discharged to the deep injection wells (concentrate), and conveyed to the distribution system. As of FY 2023, the Burnt Store RO WTP is operating on average at approximately 20 percent of its design capacity.

Table 3-3 Burnt Store RO WTP – Total Water Balance FY 2023

Month	Raw Water from Wells (MG)	Raw Water Bypass (MG)	Total Water Produced (MG)	Total Concentrate (MG)	Finished Water to Distribution (MG)
Oct-22	28.95	1.78	22.17	5.76	22.39
Nov-22	25.49	2.32	20.49	4.72	19.81
Dec-22	26.43	2.41	21.29	4.98	20.72
Jan-23	28.63	2.52	22.78	5.31	22.00
Feb-23	28.38	2.53	22.62	5.50	22.04
Mar-23	36.48	3.25	29.22	7.06	28.36
Apr-23	31.61	2.83	25.37	6.07	24.52
May-23	30.48	2.73	24.45	6.20	23.56
Jun-23	27.03	2.45	21.82	5.36	21.17
Jul-23	30.96	2.76	24.99	6.07	24.77

Month	Raw Water from Wells (MG)	Raw Water Bypass (MG)	Total Water Produced (MG)	Total Concentrate (MG)	Finished Water to Distribution (MG)
Aug-23	28.47	2.53	22.70	5.93	21.98
Sep-23	26.03	2.29	20.70	5.48	19.95
Total	**348.94**	**30.40**	**278.60**	**68.44**	**271.27**

Table 3-4 Burnt Store RO WTP – Average Flows FY 2023

Month	Raw Water from Wells (MGD)	Raw Water Bypass (MGD)	Total Water Produced (MGD)	Total Concentrate (MGD)	Finished Water to Distribution (MGD)
Oct-22	0.934	0.057	0.715	0.186	0.722
Nov-22	0.850	0.077	0.683	0.157	0.660
Dec-22	0.852	0.078	0.687	0.161	0.669
Jan-23	0.923	0.081	0.734	0.171	0.710
Feb-23	1.015	0.090	0.808	0.196	0.787
Mar-23	1.177	0.105	0.942	0.228	0.915
Apr-23	1.054	0.094	0.846	0.202	0.817
May-23	0.983	0.088	0.789	0.200	0.760
Jun-23	0.901	0.082	0.727	0.179	0.706
Jul-23	0.999	0.089	0.806	0.196	0.799
Aug-23	0.918	0.082	0.732	0.191	0.709
Sep-23	0.868	0.076	0.690	0.183	0.665
Annual Avg.	**0.956**	**0.083**	**0.763**	**0.188**	**0.743**

3.1.2 Treatment Components and Condition Assessments

Jones Edmunds personnel performed an on-site review of the WTP on January 25, 2024, and toured the facility with the Chief Operator to review plant conditions, operations, and records. The WTP is secured by a perimeter fence that surrounds the Burnt Store RO WTP and WRF. Site access is through a single security gate. At the time of the site visit, Jones Edmunds personnel observed that the security gate was still being restored to full functionality after being damaged by Hurricane Ian. This repair should be completed at the County's earliest availability to meet regulatory requirements for PWS facilities under Chapter 62-555, FAC. The site has a significant amount of brush and woods east of the WTP that should continue to be maintained to prevent on-site wildfires.

The Process Building, Storage Room, Motor Control Center (MCC) Building, and Operations/ Administration Building (shared with the Burnt Store WRF) appeared to be in good condition. The exterior of the MCC Building should be painted, the Process and Operation Building should be cleaned, and the gutters of the Process Building should be cleared of debris as needed. Non-bulk chemicals (sulfuric acid, scale inhibitor, and corrosion inhibitor) are stored in single-walled 55-gallon chemical drums; secondary containment should be provided to meet regulatory standards. Three SCADA computer stations use on-site computer graphic monitoring screens to manage and monitor the different systems within the WTP. The site

contains a small operations testing laboratory for monitoring water-quality parameters such as conductivity, pH, and temperature.

Overall, the WTP site is well maintained. Staff does an excellent job of keeping the interior of the buildings neat and clean. Valves throughout the WTP are exercised at least once per year. Process piping is painted and clearly marked indicating the raw, feed, permeate, concentrate, and finished water streams. The stainless-steel pipe and equipment are cleaned frequently. Compliance meters are calibrated every 6 months, and calibration tags are up to date. Bulk-storage chemical tanks and secondary containment are in a covered area attached to the east end of the WTP process building. The chemical tanks and piping are painted and well-marked. Eyewash and shower stations are located at the bulk storage area and the chemical feed area and are in good condition.

The chemical feed pump area requires general routine maintenance, as would be expected for any chemical feed system. CCU staff inspect the area daily for leaks and pump functionality. The chemical feed systems appeared to be operating and in good condition; however, CCU has begun replacing them because they are nearing the end of useful life. The scale inhibitor, sodium hydroxide, and sodium hypochlorite chemical feed pipes occasionally leak due to the nature of the chemicals. The manufacturer of the chemical feed units indicated that the connections need to be checked regularly and tightened as needed. The chemical feed units are discussed in more detail in the following sections.

The required documents maintained on site include:

- Monthly Operating Reports
- Operating Permits
- Operators' Licenses
- Facility Logbook
- Facility Operating Plans
- Well Laboratory Reports
- Sampling Plans
- Laboratory Results
- Flow Meter Calibrations
- Chlorine and pH Meter Calibrations
- Chain-of-Custody Forms
- Facility O&M Manuals
- Maintenance Records
- Facility Record Drawings
- Daily Temperature Logs
- Spill Protocol and Record of Spills

3.1.2.1 Source Water

The WTP currently uses seven production wells that are permitted to pump a total of 1,662,400 gpd AADF. The overall wellfield is permitted for 3,172,000 gpd AADF. All production wells are confined in fenced areas and include submersible well pumps. Flow and pressure for each of the wells are monitored through SCADA. Well pads are elevated from the surrounding ground and are not prone to flooding that would result from normal rain events. In FY 2022, new air-release valves were installed at each well. The well observations from the condition assessment are as follows:

- Well No. 7 is an 8-inch-diameter well on site adjacent to the WTP's back-up generator. This is the oldest well in operation at the WTP, but it remains in good condition. Minor rust was observed on the stainless-steel wellhead and knife gate valve operator. The operator reported that valves are typically exercised at least once per year.

- Well No. 8 is an 8-inch-diameter on-site well near the WTP entrance. The well pump was repaired in FY 2023 and is operational. However, the well is only pumping at a rate of approximately 420 gpm instead of the expected 650 gpm. Minor rust was observed on the pressure transducer saddle.
- Well No. 9 is an 8-inch-diameter on-site well near the GSTs. A new well pump and motor were installed in 2016. Minor rust was observed on the wellhead and butterfly valve operator, but overall, the well is in good condition.
- Well No. 11 is a 12-inch-diameter off-site well on Burnt Store Road. The well meter flow tube and check valve were replaced in February 2016 and are in excellent condition. Minor rust was observed on the wellhead stainless-steel pipe.
- Well No. 12 is a 12-inch-diameter off-site well on Burnt Store Road. A small burrow was found under the concrete; the County should be conscious of environmental considerations for certain animal species before performing any maintenance activities. Minor rust was observed on the stainless-steel wellhead pipe, but the pump and motor are in excellent condition. The check valve was repaired in FY 2022.
- Well No. 15 is at the rear of the site. The County completed a study in 2017 to evaluate an alternate way to bring this well back into service. A permit modification application for the reactivation of this well was submitted and became effective as of February 27, 2024.
- Well No. 16 is a 12-inch-diameter well on the east side of the site. The well pump is in excellent condition.

3.1.2.2 Pre-Treatment Components

Sulfuric Acid Addition

Sulfuric acid is used to decrease the pH of the raw water and prevent calcium carbonate precipitation. The 1,000-gallon bulk sulfuric acid storage tank is outside in the covered bulk storage area. The 100-gallon sulfuric acid storage tank is indoors near the chemical feed skid. The sulfuric acid skid contains two metering pumps. The metering pumps are at the end of their useful life, and the operator noted that CCU is obtaining new pumps for their replacement in FY 2024. The concrete secondary containment structure in the bulk chemical storage area was painted, and the 100-gallon tank inside the process room was replaced in 2021.

Scale Inhibitor Addition

A scale inhibitor is used to prevent precipitation and scaling of carbonate, sulfate, silica, and iron onto the RO membrane surfaces. Currently CCU uses A-111 Plus by American Water

Chemicals for scale inhibitor. The scale inhibitor is stored in a 75-gallon tank near the scale inhibitor feed skid in the process room. The scale inhibitor skid contains two metering pumps for redundancy. The scale inhibitor system appears to be in good condition.

Cartridge Filtration

The facility contains five stainless-steel cartridge filter-housing vessels. Each vessel holds 40 1-micron cartridge filters. The pressure differential of each cartridge filter vessel is monitored to determine when filters need to be replaced, which is typically completed two times per year. The cartridge filters are closed equipment that appeared to be in working condition; the inside components were not visible for inspection. The staff reported no irregularities. Water-monitoring gauges and instrumentation for pretreatment components are centrally mounted on a wall adjacent to the chemical feed pumps and the filter vessels. The gauges appear to be functioning properly and in good condition.

3.1.2.3 Membrane Treatment Components

RO Feed Pumps

The Burnt Store RO WTP has five two-stage RO process trains, A through E. Trains A and B are served by two horizontal split-case pumps, and Trains C, D, and E are fed by vertical turbine pumps. Each RO feed pump appeared to be in good condition and functioning as intended.

Membranes

Trains A and B are arranged in an 8:4 array – eight pressure vessels in the first stage and four pressure vessels in the second stage. Trains C, D, and E are arranged in a 14:6 array. Each pressure vessel contains seven RO membrane elements resulting in a total of 84 for Trains A and B and 120 for Trains C, D, and E. The total number of membrane elements at the Burnt Store RO WTP is 528. The membrane elements in Trains A and B are approximately 14 years old and show signs of minor membrane fouling. The membrane elements in Trains C, D, and E are 12 years old. New isolation valves were installed at all stations in FY 2022 as part of a CCU project to provide an autopsy of the membranes to better determine requirements for maintenance and/or replacement.

Sampling and Instrumentation

Membrane performance is assessed by monitoring the pressure, recovery, and water quality of the system. Staff can monitor water quality and pressure throughout the membrane process via SCADA interface on site or online. Sampling sinks and instrumentation are operating properly and in good condition.

Membrane Cleaning System

Over time, membranes may experience fouling due to scaling, plugging, break-through, or other factors. Reversible fouling can be mitigated by in situ cleaning of the membranes, whereas some fouling may require membrane replacement. The WTP's membrane cleaning system was taken offline and generally was never used according to the Chief Operator. Operators restored the system in 2018; a membrane autopsy was completed in FY 2023 to determine and implement the most effective strategy for improving or maintaining membrane performance.

The older trains (A and B) are still producing good-quality permeate but operate at higher pressures, indicating that minor fouling is occurring. Train A was last cleaned in 2012 to reverse the effects of fouling and reduce the operating pressure. Minor improvements were achieved, indicating that fouling is irreversible and will eventually require membrane replacement. The operator noted that Trains A and B will be replaced by larger membranes to match Trains C, D, and E. Trains C, D, and E are in good working condition except for some leaks on the concentrate port seals on Trains C and D. The port seals should be replaced.

3.1.2.4 Post-Treatment Components

Degasification and Clearwell

Hydrogen sulfide is removed from the RO permeate via packed-tower degasification. Three packed-tower degasification units with blowers are on top of the concrete clearwell and can be operated automatically or manually. The degasifier media was replaced in FY 2023. CCU should regularly exercise the isolation valves between the two clearwell tanks.

Degasified water is transferred from the clearwells to the GSTs by three horizontal centrifugal pumps. All three pumps are operational, but the operator noted that they struggle to pump against high head; therefore, the pumps should be serviced or replaced. The variable-frequency drives (VFDs) that control these pumps were replaced in FY 2023. Two in-line static mixers in the transfer pipe leading to the GSTs mix sodium hydroxide, corrosion inhibitor, and sodium hypochlorite. These injection points should be labeled. Air-release valves (ARVs) are also downstream of the pumps. We recommend that the pumps and piping be covered to prevent sun damage and to prolong the equipment life.

Sodium Hydroxide

Sodium hydroxide is used to adjust the pH of the finished water before pumping it into the distribution system. The sodium hydroxide system consists of a 1,100-gallon bulk storage tank, a chemical feed skid with two metering pumps, and a 90-gallon chemical feed tank. The chemical feed lines were replaced in FY 2023. The skid and smaller storage tank are in the RO process room and are in good condition. The bulk storage tank is outside near the other bulk chemical storage tanks, which poses operational issues during cold weather. When temperatures are less than 45 degrees Fahrenheit (°F), operators install heat lamps to

prevent the sodium hydroxide viscosity from increasing. The glass sight gauge on the bottom of the 1,100-gallon bulk storage tank and the ball valve on the transfer line from the bulk tank were replaced in 2018 and appear to be functioning properly.

Corrosion Inhibitor

A zinc-orthophosphate-based corrosion inhibitor is used to inhibit the dissolving of copper, lead, and zinc in the distribution system. CCU currently uses A-731 by American Water Chemicals for the corrosion inhibitor. A 30-gallon tank and chemical feed pump are indoors near the HSPs.

Sodium Hypochlorite

The sodium hypochlorite system consists of two bulk storage tanks, one 200-gallon day tank, two chemical metering pumps, and two injection points. The two bulk storage tanks are outside the process room and hold 1,400 and 1,100 gallons. The chemical containment area for the bulk storage tanks requires periodic painting. The day tank and chemical feed skid are in a segment of the RO process room. Sodium hypochlorite is primarily injected before water enters the storage tanks (pre-disinfection), although operators also have the capability of injecting after the GSTs (post-disinfection) if needed to boost the chlorine residual. The sodium hypochlorite system appears to be in good operating condition.

Analyzers inside the clearwell monitor water quality. The analyzers report the water quality data using VTScada, which can be monitored from the Operations Building or online. Instruments and chemical feed rates can be adjusted to obtain the proper water quality. Instrumentation is calibrated and up to date. We recommend that the cover of the analyzer panel be extended to protect the equipment during rain events.

3.1.2.5 Storage and Distribution HSPs

The Burnt Store RO WTP contains three 0.5-MG concrete GSTs housing a total of 1.5 MG of finished water. GSTs A and B were cleaned, inspected by CCU staff, and received new interior coatings in FY 2022; GST C was inspected and repainted in FY 2023. No sedimentation or defects were found in any tank. The outside of GST B was painted in 2019. The outside of GST A was cleaned and painted in 2020.

Four 125-HP HSPs (up to 1,400 gpm) and two 25-HP smaller jockey pumps are available to convey finished water to the distribution system.

The VFDs on the pumps provide a constant pressure of 65 psi at the beginning of the distribution system at the WTP regardless of the water use. At the time of the site visit, the HSPs were operational and appeared to be in good condition.

3.1.2.6 Concentrate Disposal/Deep Injection Wells

Concentrate from the RO process is disposed of by means of the on-site deep injection wells IW-1 and IW-2. Both wells are permitted to accept concentrate and treated wastewater effluent. Concentrate is transferred to the deep well pumping station clearwell by residual pressure from the RO treatment trains where it is combined with wastewater effluent and injected into the deep wells. 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.

Both injection wells have flow meters and pressure gauges that can be monitored in the control room. Both wells undergo mechanical integrity testing (MIT) every 5 years. A MIT was successfully performed on IW-1 on June 8, 2020. The next MIT for this well is due in 2025. Additionally, a MIT was successfully performed on IW-2 on May 24, 2023. The next MIT for this well will need to be performed by April 5, 2028. A vibration analysis was also conducted for the vertical turbine injection well pumps in 2017. Due to the test results, the pumps were reprogrammed to minimize wear and appear to be functioning properly at the time of the site visit. The pumps at the station were painted in 2018.

3.1.2.7 Electrical Components, Standby Power, and Circuitry

The main electrical components of this facility include the electrical components of the RO process buildings, one 1,250-kW standby generator, and two 80-kW portable generators. The distribution transformer, which provides power to the site, appears to be in good condition with no obvious signs of significant concern. CCU's Risk and Resilience Assessment (RRA) in 2020 recommended bollards be installed around the influent transformer box.

RO Process Building and MCC Building

The incoming switchgear appears to be in good condition with minor issues. The switchgear contains warning labels identifying parts and components behind blank cabinets as being energized. The electrical equipment is marked with arc flash labeling.

Auxiliary Power

The WTP generator and automatic transfer switch (ATS) were part of the 2009 upgrade of the WTP. The standby generator is operated for 4 hours under load twice per month. A contractor performs the maintenance. The generator was cleaned and serviced in FY 2020. Two generators that were historically attached to Wells No. 15 and 16 were converted to portable generators. They can now be used to power the pumps at wells No. 11, 12, 15, and 16 through permanently mounted generator connections at each well.

CCU is storing a new ATS on site that they are planning to install in the room north of the MCC room. Once the new ATS is installed, the existing ATS will be taken offline. The timeline for this work to be completed was noted as uncertain. The existing ATS has experienced repairs throughout its lifetime but is currently working and functional.

3.1.3 Operations

The facility is staffed 16 hours per day, 7 days per week. The Burnt Store RO WTP operators remotely monitor the pressures in the Burnt Store distribution system 24 hours per day. Alarms can be evaluated, and operators or maintenance personnel can be deployed to take corrective action, if necessary. Since the water demand of the system does not require 24-hour production, the RO treatment trains are regularly alternated to reduce membrane fouling. The operator indicated that typical membrane operation alternates daily between (1) Trains A and B plus one additional train (C, D, or E) in service and (2) Trains C, D, and E in service.

In FY 2021, Jones Edmunds recommended relocating the security camera displays to the Operations Office Building. In FY 2022, the security camera displays were relocated to the Operations Office Building; however, the displays were installed in a separate small electrical room. The security camera displays should be relocated to a more useful and accessible location, such as a monitor display in the operator office(s).

3.1.4 Maintenance

Routine maintenance is performed on a scheduled basis. Groundwater wells are visually inspected daily and well valves are exercised yearly. Generators are tested weekly and serviced monthly. Rehabilitation of major pieces of equipment is completed according to the CIP that is revised yearly. In-house maintenance personnel or outside contractors perform maintenance required to keep the WTP in compliance with regulations. The treatment process requires continual maintenance of the chemical systems. The Chief Operator has established a daily chemical system inspection routine in which the inspection results are recorded in a log. Leaks or other malfunctions are addressed immediately or referred to the Chief Operator for maintenance.

As part of the daily inspection, the Operations staff calibrate the chemical feed pumps, examine the membrane process piping, visually check the union connections and other potential sources of leaks for each chemical storage and feed system, and tighten components as needed. The staff change the cartridge filters every 6 months or when the differential pressure across the vessel exceeds 50 psi. Membranes are cleaned or replaced as determined by continuous water-quality and hydraulic monitoring. GSTs are scheduled for cleaning and inspection every 5 years in accordance with FDEP Section 62.555.350(2), FAC.

3.1.5 Review of Previous Report Recommendations

Table 3-5 summarizes the recommendations and status from the 2022 Annual Report for the Burnt Store RO WTP.

Table 3-5 Burnt Store RO WTP 2022 Recommendations and Status

Recommendation:	Develop a wildfire Emergency Response Plan (ERP), identify fire hydrant locations, and coordinate with Fire Department for trainings for critical assets.[1]
Progress:	Ongoing.
Recommendation:	Update the ERP for pipe failure for all critical assets.[1]
Progress:	Ongoing.
Recommendation:	Identify a backup chemical and fuel supplier in the event of a chemical or fuel shortage.[1]
Progress:	Not Completed.
Recommendation:	Develop an ERP for operating without the support of SCADA.[1]
Progress:	Not completed.
Recommendation:	Develop a procedure and obtain the equipment for transporting key chemicals (fuel and chlorine) from one site to another if required in an emergency.[1]
Progress:	Ongoing.
Recommendation:	Link contamination detection to SCADA to immediately shut down or lockout any pump in operation.[1]
Progress:	Not completed.
Recommendation:	Evaluate installing monitors in operators' offices in the Operations Building for improved security surveillance.
Progress:	Ongoing.
Recommendation:	Install additional permitted groundwater wells as needed to meet future demands as identified in the Potable Water Master Plan. CCU should initiate plans to install at least one new well in 2023.
Progress:	Ongoing. Babcock Ranch Wellfield is being evaluated as a potential future water supply for Burnt Store.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Progress:	Ongoing.
Recommendation:	Perform yard maintenance around the perimeter fencing.[1]
Progress:	Ongoing.
Recommendation:	Repair the security gate mechanism so that it can be opened and closed remotely.
Progress:	Some functionality restored, but the gate is still pending full rehabilitation or replacement.
Recommendation:	Continue to inspect and tighten the connections for the scale inhibitor, sodium hydroxide, sodium hypochlorite, and sulfuric acid pipes daily to prevent leakage.
Progress:	Ongoing.
Recommendation:	Replace multiple end caps that are leaking on Trains No. C and D.
Progress:	Scheduled.
Recommendation:	Install a cover over the transfer pumps and piping near the degasifier towers to prevent sun damage and prolong equipment life.
Progress:	Not completed.
Recommendation:	Continue to spray wash the concentrate disposal wetwell as needed.
Progress:	Completed on an as-needed basis.

Recommendation:	Continue performing controlled burns on the property to maintain the shrub growth and fire buffer around wells.[1]
Progress:	Ongoing.
Recommendation:	Install bollards around the influent transformer box.[1]
Progress:	Completed.
Recommendation:	Install fire hose connections on the well piping.[1]
Progress:	Not completed.
Recommendation:	Develop an ERP for valve failure in the clearwell and begin exercising the valve.[1]
Progress:	Not completed.
Recommendation:	Repair or replace the pump at Well No. 8.
Progress:	Completed.
Recommendation:	Replace the media in the degasification towers. According to CCU staff, cleaning and inspection determined that replacing media was the most economically feasible solution.
Progress:	Completed.

[1] Recommendation from the *Charlotte County RRA Report* (March 2020).

4 WATER DISTRIBUTION SYSTEMS

This Chapter reviews the potable water distribution system infrastructure of CCU's two independent PWSs. Figure 3-1 is a map of CCU's PWSs and associated infrastructure. Jones Edmunds personnel evaluated the water distribution system components on January 26, 2024. The larger system that serves the central and west portions of Charlotte County (Port Charlotte water distribution system) is supplied with water from the Authority and uses chloramines as the disinfectant. The smaller system that serves the south area of Charlotte County (Burnt Store water distribution system) is supplied by water from the CCU-owned Burnt Store RO WTP, which uses free chlorine as the disinfectant.

At the end of FY 2023, CCU had 65,578 customer accounts in the Port Charlotte PWS and 3,535 customer accounts in the Burnt Store PWS. Based on inventory data provided by the County when this report was prepared, the two systems contain approximately 1,532 miles of water mains ranging in size from 2 to 10 inches in diameter for the distribution mains and from 12 to 36 inches in diameter for the transmission mains, as well as 5,277 fire hydrants.

The CCU water distribution system generally consists of the following major components:

- Authority water supply interconnects for delivery of water from the Authority's regional transmission system to CCU transmission mains.
- CCU transmission mains that convey water from the Authority's water supply interconnects to the distribution mains.
- Transmission mains in the Burnt Store PWS that transport water from the Burnt Store RO WTP to distribution mains in South County and north Lee County.
- Distribution mains that supply water from the transmission mains to customers.
- Fire protection assemblies and fire hydrants that may also be used to flush the distribution system for maintenance purposes.
- Isolation valves that allow the operators to shut off the flow in pipe sections for maintenance purposes.
- GSTs that provide storage for peak customer demand, firefighting, and periods when treatment plants are not producing water.
- Disinfection facilities to maintain appropriate disinfection levels in the distribution system for delivery to the consumer.
- WBSs adjacent to GSTs and associated disinfection chemical feed facilities.
- A 24-inch check valve on the main supply line from the PRF to maintain system pressures and reserve water supply if the PRF is unable to supply water and pressure during emergencies.
- Interconnects with neighboring utilities for system redundancy and system flexibility.

4.1 PORT CHARLOTTE WATER DISTRIBUTION SYSTEM

The Port Charlotte PWS water is supplied to CCU through four Authority-owned regional transmission mains. The original pipeline is a 36-inch-diameter line supplemented by a 12-inch line. In September 2007, a 24-inch main became operational. In August 2012, a 42-inch main became operational. Based on existing CCU geographic information system (GIS) data at the time of this report, the Port Charlotte PWS consists of four aboveground, pre-stressed concrete GSTs with a total combined capacity of 10 MG, six WBSs, one chemical

booster station, seven supply interconnects, nine emergency interconnects, approximately 1,479 miles of water main pipes between 2 and 36 inches in diameter, and 5,277 fire hydrants. The following sections describe the system interconnects and WBSs in Mid and West Charlotte County.

4.1.1 AUTHORITY SUPPLY INTERCONNECTS

The Port Charlotte PWS contains supply interconnects used exclusively to receive Authority water supplies; several interconnects have been installed over the years, providing CCU with redundancy and system flexibility. As allowed by the Authority contract, CCU may re-sell Authority water supplies to adjacent utilities using available emergency interconnects described in Section 4.1.2. Table 4-1 lists the Charlotte County metered supply interconnects with neighboring entities. The supply interconnects are owned by the Authority and are reported to be in good condition by CCU staff.

Table 4-1 Charlotte County Metered Supply Interconnects

Entity	Name	Approximate Location	Size
Authority	Discovery Drive Meter Station	Discovery Drive	24-inch
Authority	Kings Highway Meter Station	173 Kings Highway	24-inch
Authority	Kings Highway Meter Station	173 Kings Highway	12-inch
Authority	Harbor Boulevard Interconnect	21453 Bachmann Boulevard	24-inch

4.1.1.1 Discovery Drive Meter Station

The Phase 1A Punta Gorda pipeline interconnect (Kings Highway/Shell Creek Loop) consists of over 12 miles of pipeline with a minimum design capacity of 6.0 MGD, aboveground storage, high-service pumping, disinfection facilities, and tie-in points with CCU. The geographical end points of the interconnect are the Authority's 24-inch Regional Transmission System (RTS) on Kings Highway at the Charlotte/DeSoto County line and the City of Punta Gorda's Shell Creek WTP on South Washington Loop Road in Charlotte County. The interconnect is on Discovery Drive, is owned and operated by the Authority, and is used as a master meter to track water delivered to CCU along I-75 interconnects.

4.1.1.2 Authority Supply Connections

The Authority supply connections are on the north and east edges of the Mid County distribution system and supply water to Mid and West County. The Kings Highway and Harbor Boulevard connections contain interconnect vaults and telemetry that are owned by the Authority but can be accessed by Charlotte County. The connections along I-75 (Rampart, Luther, and Sandhill) are buried and do not have flow monitoring at each location; instead, the flow is calculated from the flow meters on Kings Highway and the Punta Gorda Interconnect flow meter.

Additionally, CCU will be funding its contractual portion of the allocation of the new 42-inch-diameter transmission main from approximately the Harbor Boulevard connection to Gulf Cove WBS, along Hillsborough Boulevard, Chancellor Boulevard, and Campbell Street; the new transmission main will provide additional flow and pressure to Mid and West County and will include several new supply connections. The project has recently begun construction and is expected to be completed by the end of 2025.

4.1.2 EMERGENCY INTERCONNECTS

As a further 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 advanced metering infrastructure (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 PWS, two interconnects with the Gasparilla Island Water Association (GIWA), one interconnect with EWD, and one interconnect with Punta Gorda. Table 4-2 lists the County's emergency interconnects.

Table 4-2 Charlotte County Emergency Interconnects

Entity	Name	Approximate Location	Size
CHWA	CHWA WTP Interconnect	2515 Highlands Road	6-inch
CHWA	CHWA Interconnect	22234 Edgewater Drive	6-inch
City of North Port	Flamingo Boulevard Interconnect	W Hillsborough Blvd	12-inch
City of North Port	Biscayne Drive Interconnect	17 Biscayne Drive	16-inch
GIWA	GIWA Interconnect	12595 Gasparilla Road	10-inch
GIWA	GIWA WTP Interconnect	5050 Linwood Road	6-inch
EWD	Englewood Interconnect	6369 Richledge Street	12-inch
Authority Phase IA Pipeline	Punta Gorda Interconnect	27589 Disston Avenue	24-inch

The emergency interconnects with CHWA, North Port, the Authority, and GIWA require little maintenance other than exercising valves, but a flow meter at the Biscayne interconnect with the City of North Port was replaced in FY 2017. In FY 2018, the design for a new interconnect was completed at the North Port interconnection with Flamingo Boulevard. The County relocated the Flamingo Boulevard interconnect to the City of North Port's nearby new pump station on Hillsborough Boulevard. The project was completed in FY 2019.

4.1.3 WATER BOOSTER STATIONS

Booster stations are strategically located in the distribution system and typically adjacent to GSTs. The equipment at the booster stations is secured by chain-link fences with barbed-wire tops. The booster stations are used to increase the flow, pressure, and disinfectant concentrations throughout the system. As previously discussed, CCU has repurposed or discontinued the Gertrude (WBS #1) and Fivelands (WBS #5) booster stations. The Myakka Water Booster Station (WBS #9) remains in operation as a pressure/flow station only. The chemical injection capabilities have been removed and suspended for the foreseeable future. The following sections describe the active WBS operations and their respective conditions.

4.1.3.1 Port Charlotte Golf Course – WBS #2

The Port Charlotte Golf Course Booster Station is at 22339 Gleneagle Terrace, Port Charlotte, Florida 33952. The station provides local storage, pressure, and disinfectant boosting capability for the Mid County service area east of Tamiami Trail. The station was built in 1966 and rehabilitated in 2011. The station contains a climate-controlled laboratory and electrical room, a ventilated pump and chemical feed room, and a 1-MG GST. The station is fenced and has one automatic access gate. The station contains two chemical-injection systems for sodium hypochlorite and ammonium sulfate addition. Each system contains three metering pumps and two chemical storage tanks. The two 300-gallon ammonium sulfate storage tanks and two 900-gallon sodium hypochlorite tanks have the proper secondary containment and are under a covered shed adjacent to the pump room. CCU operates the station to maintain a 4.0-mg/L disinfectant residual. The station has a detached diesel generator for backup power supply.

The following O&M upgrades were made over the last 3 years:

- 2021 – Sealed the chemical injection piping wall connection.
- 2022 – Upgraded security.
- 2022 – Repaired/replaced the perimeter fence.
- 2023 – Added new labels to the chemical storage tanks and fill valves.
- 2023 – Inspected the GST.
- 2023 – Installed a roof ridge cap.

Condition Assessment

Jones Edmunds completed an on-site review of the WBS on January 26, 2024, and the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as previously recorded during the hurricane assessment performed in 2022, and has been working to address them accordingly. The station appears to be in good condition overall with updated equipment. The graveled areas around the station infrastructure are free from weeds, and the landscaping is well maintained. Due to prior roof damage, water has leaked inside the building and damaged a computer that should be replaced. All tools and equipment are organized and stored properly inside the building. The HSPs are maintained and appear to be functioning properly. The lower portion of the ladder cage on the side of the aboveground storage tank is torn off and needs to be repaired or replaced.

Additionally, a Jones Edmunds electrical engineer conducted an electrical equipment site visit assessment on February 28, 2024. The electrical engineer noted that lights for the covered storage area at the southwest corner are missing vapor-protection covers and are exposed to the environment. Operations staff also noted that when weekly maintenance and testing

(testing is performed for 1 hour) are performed on the generator set, the VFDs have frequently faulted out due to over-voltage and have to be manually reset. The reason for this issue is not known and will need to be investigated. The incoming switchgear and distribution transformer appear to be in good condition with no obvious signs of significant concern. The generator and enclosure are mounted outside on an elevated sub-base fuel tank. They appear to be in good condition.

The review of the WBS showed most systems appear to be in good condition and well maintained.

The following deficiencies were noted:

- The computer inside the building is damaged from a water leak through the roof of the building.
- The lower portion of the ladder cage on the side of the aboveground storage tank is torn off and laying on the ground.
- The flow meter screens are damaged from sunlight exposure.
- The hazard warning labels on the diesel fuel tank is torn and illegible.
- Lights for the covered storage area are missing vapor covers and are exposed to the environment.
- The VFDs frequently fault-out when maintenance is performed on the generator set.

4.1.3.2 Gulf Cove – WBS #3

The Gulf Cove Booster Station was built in 1980 and is at 12050 Van Lenten, Port Charlotte, Florida 33981. The station receives flow through an aging 12-inch ductile-iron pipe that spans under the Myakka River and feeds the 2-MG GST. The station has four HSPs, rated at 50, 60, 75, and 100 HP. The pumps and electrical components of the station are in a ventilated building. The station is fenced and contains two entrances with automatic gates.

The station contains two chemical injection systems for ammonium sulfate and sodium hypochlorite addition. Each skid has two chemical feed pumps for redundancy. The booster station has two 600-gallon sodium hypochlorite storage tanks and two 300-gallon ammonium sulfate storage tanks. Chemical skids and associated analyzers are in ventilated buildings, and the chemical storage tanks are outside under covered sheds. The sodium hypochlorite storage tanks are double walled, and the ammonium sulfate storage tanks contain secondary containment basins for safety.

Disinfectant residual is continuously monitored using an ammonia/monochloramine analyzer. CCU operates the station to maintain a 4.0-mg/L disinfectant residual. The booster station contains a diesel generator as a backup power supply.

The following O&M improvements were completed over the past 3 years:

- 2021 – Cut and reinstalled drain line screen to remove debris and adjusted discharge area to accept flows.
- 2021 – Placed tank repaired in 2020 into service.
- 2021 – Replaced Motor No. 4.
- 2022 – Installed new fencing around the perimeter.
- 2022 – Inspected the GST and repaired minor wall leakage.
- 2022 – Installed new 15-gallon-per-hour (gph) Jesco DX50 sodium hypochlorite pumps.
- 2022 – Installed new light-emitting diode (LED) lighting in the pump and chemical storage tank rooms.
- 2022 – Replaced Pump No. 4 VFD and subsequently corrected VFD issues by installing higher-voltage fuses.
- 2022 – Replaced an existing chlorine chemical storage tank with a new tank.
- 2023 – Installed new conduit from the generator to the electrical building.
- 2023 – Installed new security cameras.
- 2023 – Replaced bearings and motor in HSP No. 1.
- 2023 – Replaced HSP No. 2.
- 2023 – Replaced sodium hypochlorite feed Pump No. 2.
- 2023 – Repaired roof damage from Hurricane Ian.
- 2023 – Replaced chemical level displays.

A generator replacement project is in progress, which includes adding a new generator and fuel tank sized to support four 150-HP pumps. Additionally, the corroded exhaust fans in the ammonia chemical room are expected to be replaced in FY 2024.

Condition Assessment

The station generally appears to be in good condition. Roads and landscaping are well maintained. Graveled areas around the facility infrastructure are free from weeds, and the grass is cut. The fence surrounding the perimeter is being replaced in response to damage done by Hurricane Ian. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. The HSPs are well maintained and appear to be functioning properly, with Pump #2 having been replaced in FY 2023. At the time of the site visit, Operations staff was installing a new expansion joint and butterfly valve in-line with Pump No. 1. The GST was offline for maintenance and the operator noted that the GST will remain offline until facility improvements are made, which will consist of pumping improvements, a new GST or GSTs, and yard piping improvements.

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. The incoming power company transformer shows signs of surficial rust. The standby generator reportedly functions properly and has no apparent issues. Generators are exercised weekly for 1 hour by CCU. The fuel system on the generator is a separate fuel tank, not a sub-base fuel tank as in many other installations throughout the County. The fuel tank is undersized and is insufficient to provide the County's minimum required 72 hours of operation during a storm event; however, CCU noted that installation of a new generator and fuel tank of adequate load and capacity is nearing completion but is currently awaiting load bank testing. The fuel piping and transfer system appears in good

condition with no apparent signs of leakage. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

- In FY 2021, the Operations staff reported that several VFDs had failed due to power-quality issues. These issues were resolved in FY 2022 by replacing the fuses and drives with ones of higher voltage.

The following deficiencies were noted:

- The pipe connecting the GST to the pump station is constructed of formed concrete, which is not industry standard.
- The pump building requires repainting.
- The ammonia chemical feed room exhaust fan is severely corroded and will not function.
- The conduit wires from the newly installed cameras are not fully enclosed.
- The copper chemical injection quill connections are corroded and should be replaced with Schedule 80 quill connections.
- The chemical feed room is lacking secondary containment.

4.1.3.3 Walenda – WBS #4

The Walenda Booster Station is at 17177 Walenda Avenue, Port Charlotte, Florida 33953. The property contains potable water and reclaimed water infrastructure including reclaimed and potable water GSTs. The potable water GST has a capacity of 2 MG. The potable water station was built in 1994 and has two 100-HP and three 75-HP pumps. The larger pumps were replaced in 2010, and the smaller pumps were investigated as part of the Potable Water Master Plan. The pumps and electrical components are in a ventilated room. The laboratory and office are in a climate-controlled room. The station is fenced and has two entrances with automatic gates. The station contains two liquid-handling systems for sodium hypochlorite and ammonium sulfate injection. The sodium hypochlorite system contains two 1,000-gallon bulk storage tanks and a chemical injection skid. The ammonium sulfate system consists of two 300-gallon bulk storage tanks and a chemical skid. The chemical skids for sodium hypochlorite and ammonium sulfate each contain two metering pumps and are in ventilated rooms. The bulk storage tanks are outside under covered sheds within secondary containment structures. CCU operates the station to maintain a 4.0-mg/L disinfectant residual using an ammonia/ monochloramine analyzer and a total chlorine analyzer. A diesel generator in the pump room provides backup power to the station. The generator is exercised weekly.

The following O&M improvements were completed over the past 3 years:

- 2021 – Installed a new HACH 5500 SC analyzer to replace the HACH 6000 unit.
- 2021 – Programmed the influent chemical control for pre-chlorination.

- 2021 – Replaced seals, bearings, and O-rings in Pump No. 3.
- 2021 – Modified the distribution piping to the south along Walenda Avenue. Removed a 16-inch check valve and replaced with straight piping. This modification was performed to accommodate a large development (future) to the immediate south of the Walenda WBS.
- 2022 – Installed new 1-inch mesh security fence around perimeter of station.
- 2022 – Replaced I/O card.
- 2023 – Replaced sodium hypochlorite Pump No. 2.
- 2023 – Installed a new electrical box.
- 2023 – Replaced the fuel injector and injection pump on the generator.
- 2023 – Replaced the chemical level-indicator display on sodium hypochlorite bulk storage tank No. 2.
- 2023 – Replaced the soffit on the pump building.

Condition Assessment

Jones Edmunds completed an on-site review of the WBS on January 26, 2024, and the information gathered at that time was used to update this section, in accordance with the project scope. The general condition of the station appears to be good with no obvious signs of significant concern. The access roads outside the facility are aging and need to be repaved but appear to be in fair condition inside the property. Graveled areas around the station infrastructure are free from weeds, and landscaping is well maintained. A new security fence was installed in FY 2023 around the site perimeter, but the site still requires removal of debris from Hurricane Ian, particularly at the northwest corner of the site where fallen trees were observed. A portion of the site fence near the entrance is damaged, causing the gate to be inoperable. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. The HSPs are well maintained and appear to be functioning properly.

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. CCU staff reported that the existing on-site standby generating system is slightly undersized for a full load of the facility; a new generating system has been ordered and will be installed to meet the required fuel and load capacities. The generator is inside the building that also contains the electrical switchgear. The security camera needs to be reinstalled, and the internet antenna needs to be repaired. Overall, the electrical equipment appears to be in good functioning condition with no significant signs of concern based on information from the Operations staff.

The following deficiencies were noted:

- The tank inspection found an issue in the tank bonding that will require multi-layer stripping before the tank can be repainted.
- CCU Operations staff confirmed that the generator is unable to accommodate the existing loads of the facility, which is a significant concern and relates to the operational security of the facility. Additionally, the generator is inside the building that also contains the electrical switchgear; this raises concerns regarding maintenance personnel being properly notified of hazardous conditions that may exist during maintenance operations including fuels present, elevated noise level, and potentially excessive heat. Excess heat may also be detrimental to the VFDs in the building since these devices are typically temperature sensitive. Staff indicated that the fuel system for the generator is sufficiently sized and functioning properly to handle the current loading.

- The chemical injection skid containment areas appeared to feature open-floor sumps filled with rocks. Staff indicated that the floor sumps were abandoned water meter boxes. To comply with regulations, the floor sumps should be properly surfaced and/or sealed.

4.1.3.4 Rotonda – WBS #6

The Rotonda Booster Station is at 46 Parade Circle, Rotonda, Florida 33947. Built in 1973, the station has two 100-HP pumps, two 60-HP pumps, and a 5-MG GST. The pumps and electrical components of the station are in a ventilated building. The station also contains a separate climate-controlled building with an office and laboratory. The station is fenced and has one gated entrance.

The station has two chemical feed systems for injecting ammonium sulfate and sodium hypochlorite. The ammonium sulfate skids are in a ventilated shed, and each skid contains two metering pumps for injection before and after the GST. The sodium hypochlorite skids are in a chemical room attached to the main pumping room, and each skid contains two metering pumps for injection before and after the GST. Ammonium sulfate is stored in two 300-gallon bulk storage tanks, and sodium hypochlorite is in two 1,000-gallon bulk storage tanks. The chemical storage tanks are housed within a covered structure with secondary containment chambers for safety.

Disinfectant residuals are continuously monitored by an ammonia/monochloramine analyzer. CCU operates the station to maintain a 4.0-mg/L disinfectant residual. A diesel generator is available on site to provide backup power supply to the station. The generator is tested weekly.

The following O&M improvements were completed over the past 3 years:

- 2021 – Bypassed the storage tank for liner replacement.
- 2021 – Repaired the generator.
- 2021 – Installed a mixer in the GST.
- 2022 – Repainted aboveground piping.
- 2022 – Installed new lighting.
- 2022 – Installed new fencing around the perimeter.
- 2022 – Installed new rotating assembly into Pump No. 1.
- 2022 – Power-washed the GST.
- 2022 – Repainted the influent GST piping.
- 2022 – Replaced the generator battery.
- 2023 – Installed a new exhaust fan.
- 2023 – Installed new LED lighting in the HSP room.
- 2023 – Installed a new rotating assembly and replaced the suction valve on HSP No. 2.
- 2023 – Replaced sodium hypochlorite feed Pump No. 1.

- 2023 – Repaired the generator stairs.
- 2023 – Installed a new concrete pad and shed.
- 2023 – Replaced the bleach tank.
- 2023 – Installed a new breaker and PLC uninterruptable power supply.
- 2023 – Repaired the perimeter fence.

Condition Assessment

The station appears to be in fair condition. Roads and landscaping appear to be in good condition. Graveled areas around the facility infrastructure are free from weeds. The indoor buildings are kept clean, and tools and equipment are organized and stored properly. Operations staff is currently painting the wall that contains the human-machine interface (HMI) in the pump room. Hurricane Ian damaged the plumbing, waterlogged the roof of the building, and blew away the awning over the chemical storage tanks.

Interviews with operators indicate that the valves in and out of the GST are exercised regularly, but that standard gate valve #5 is difficult to close.

The incoming switchgear and distribution transformer appear to be in fair to poor condition. Equipment was identified as possibly being at the end of their service life because of their age. CCU is currently involved in a pumping and electrical improvements project for the WBS which will replace existing electrical equipment. CIP includes a project to replace all main switchgear in this facility this fiscal year or next.

The following deficiencies were noted:

- Much of the switchgear appears to be in fair-to-poor condition and is possibly reaching the end of its service life. Many components may no longer be manufactured, making long-term maintenance an issue.
- An exterior-mounted ATS appears to be in fair condition and degraded due to exposure to weather. The operator noted that the ATS is planned to be relocated inside during FY 2024.
- Foam spacers are between the updated VFD drives and the enclosure.
- The GST influent pipe has several large paint chips.
- The chemical storage tanks are not clearly labeled.
- The building roof is damaged and waterlogged.
- The generator has a slight exhaust leak.

4.1.3.5 Ingraham – WBS #7

The Port Charlotte PWS contains one disinfection booster station at 14276 Ingraham Boulevard, Port Charlotte, Florida 33981. The Ingraham Boulevard sodium hypochlorite/ammonium sulfate injection station monitors chlorine residual and injects additional disinfection chemicals to maintain the FDEP-required levels. The injection station is enclosed in a 6-foot chain-link fence with barbed wire on top. The station contains two ventilated buildings; one serves as an office and the other houses the chemical skids. Each skid contains one metering

pump, and a spare is kept on site. The system does not have a permanent backup generator and relies on the sewer system pump station power adjacent to the booster station. A total chlorine residual of 4.0 mg/L is maintained by injecting sodium hypochlorite and ammonia at a rate that is paced by the flow passing the station. The chlorine level and local water pressure are monitored continuously.

The following upgrades were made over the last 3 years:

- 2021 – Installed a new flow meter to replace a failed one.
- 2021 – Repaired the doorstep to the water-quality testing and storage shed.
- 2022 – Installed a new insertion flow meter at bridge crossing; solar-powered radio signal transmits flows back to the station.
- 2022 – Installed new sump pump and wiring.

Condition Assessment

The general condition of the station appears to be fair. The buildings are weathered but in operable condition. The landscaping is maintained. The electrical components at the Ingraham Disinfection Station appear to be in good condition with no obvious signs of significant concern. The station does not have access to backup power in the event of power loss.

The following deficiency was noted:

- The sodium hypochlorite level indicator is not working properly and should be repaired or replaced.

4.1.3.6 Englewood – WBS #8

The Englewood (EWD) WBS is at 6369 Richledge Street, Englewood, Florida 34224. The EWD WBS is primarily used to boost water pressure or transfer water between EWD and CCU during an emergency. It includes two 40-HP booster pumps with a diesel generator for backup power supply. The station was upgraded in FY 2022 to include a chemical disinfection dosing system. However, the station was heavily damaged by Hurricane Ian in September 2023, including damage to electrical equipment and the on-site generator; the WBS has not been used since the Hurricane while repairs are pending. Monitoring at the interconnect facility includes total chlorine residual, free ammonia residual, pressure, and flow. By opening or closing valves, the EWD interconnect pumping station can pump water in either direction, i.e., to or from EWD. However, EWD and CCU must both get permission from and will be billed by the Authority to receive excess water as stipulated by the Authority contract.

In FY 2015, Charlotte County completed minor modifications to the pumps and piping system that allow this facility to increase water circulation in the west portion of CCU's service area. A new flow meter was installed and shows the circulation is approximately 750 gpm. This change has resulted in increased system pressure and chlorination residual levels in the area

that are required to meet FDEP delivery disinfection requirements. CCU replaced a faulty HMI in FY 2017 and constructed an aluminum cover over the pumps and piping at the site in FY 2018. CCU also installed a new flow meter at the interconnect to monitor flows crossing SR 776 in West County. During the site visit, the operator noted that an upgraded transformer will be needed in the future.

The following upgrades were made over the last 3 years:

- 2021 – Built a new canopy beside the existing canopy.
- 2021 – Incorporated chemical injection of sodium hypochlorite and ammonium sulfate into the existing permit.
- 2022 – Installed a chemical dosing system including the following:
  - One double-walled 500-gallon sodium hypochlorite storage tank.
  - One double-walled 120-gallon ammonium sulfate storage tank.
  - One in-line chemical mixer with two chemical injection quills.
  - Two built-in-house chemical injection skids.
  - One eyewash station.

Condition Assessment

Due to damage done by Hurricane Ian, the interconnect has not been in operation since the storm. The control panel was flooded, and evidence of a small electrical fire was present. The small office building used as an operator laboratory was blown away.

The following deficiencies were noted:

- The operator laboratory/office building is completely gone.
- The control panel is powered but shows signs of water damage and previous fire.
- Conduit to the control panel is rusted.
- The perimeter fence is damaged and needs repair.

4.1.3.7 Myakka – WBS #9

The Myakka Booster Station is at 4070 Railroad Avenue, Port Charlotte, Florida 33953. The property includes a potable water booster station and a wastewater vacuum collection station. However, since its installation, this WBS has historically been unused by CCU due to upstream hydraulic issues caused by operation of the Myakka WBS and, therefore was not inspected. The potable water station was built in FY 2020 and has three 40-HP pumps. The HSPs are skid mounted for future removal and use at other sites. The pumps, electrical components, and water-quality testing appurtenances are in a climate-controlled room. The station is fenced and has one entrance with a manual gate. The station does not include disinfectant dosing features; however, residual chlorine and ammonia are monitored continuously throughout each day. A diesel generator provides backup power to the station.

The following upgrades were made over the last 3 years:

- 2021 – Increased the suction pressure setpoint.
- 2021 – Rebuilt Pump No. 1.

Condition Assessment

Jones Edmunds last completed an on-site review of the WBS on November 15, 2022, as part of CCU's Hurricane Ian Damage Assessments; the information gathered at that time was used to update this section, in accordance with the project scope. CCU staff is aware of the following damages, as recorded during the hurricane assessment, and has been working diligently to address them accordingly. The station appears in great condition overall.

The following deficiencies were noted:

- The roof was damaged; it is missing shingles and is wrapped with plastic.

4.1.4 STORAGE

GSTs are cleaned and inspected every 5 years. The tanks are designed to be filled by residual pressure and/or by use of pressure sustaining valves. The water is pumped from the GST and pressurized to the desired system pressure before re-entering the distribution system. The GSTs provide the following functions for the CCU water supply system:

- Store water in case of an interruption of service at the WTP or a main transmission pipe failure.
- Provide local water to booster stations to provide adequate pressure for CCU customers and for firefighting.
- Meet peak demand by storing water during low-use periods for release during high-use periods.

Four operational potable water GSTs are included in CCU distribution systems, ranging in capacity from 1 to 5 MG for a total capacity of 10 MG. The Burnt Store water distribution system does not have any WBS but includes three 0.5-MG GSTs at the Burnt Store WTP. In addition, six 2-MG GSTs (for a total capacity of 12 MG) are at the PRF. This stored amount of treated water is available to Charlotte County and other Authority members for water supply for peak use such as fire flow or in case of a temporary loss of treatment at the PRF.

Table 4-3 lists the GST capacities and number of HSPs and chemical feed pumps at each WBS.

In addition, six 2-MG GSTs (for a total capacity of 12 MG) are at the PRF. This stored amount of treated water is available to Charlotte County and other Authority members for water supply for peak use such as fire flow or in case of a temporary loss of treatment at the PRF.

Table 4-3 WBS GST Capacities, HSPs, and Chemical Feed Pumps

Booster Station Name	GST Capacity (MG)	Number of HSPs	Number of Chemical Pumps
Port Charlotte Golf Course	1	2	6
Gulf Cove	2	4	4
Walenda	2	5	4

Booster Station Name	GST Capacity (MG)	Number of HSPs	Number of Chemical Pumps
Rotonda	5	4	8
Ingraham	—[1]	0	2
Englewood	—[1]	2	4
Myakka	—[1]	3	0
Total	**10**	**20**	**28**

Note: [1]No GST exists at this location.

4.1.5 Operations

Treated water from the PRF enters the main CCU service area via four metered regional transmission mains. In general, potable water flows from northeast Mid County to southwest West County. Water enters the Port Charlotte water distribution system from Authority supply interconnects at the northeast extents of Port Charlotte, then flows to the Golf Course WBS and the Walenda WBS, which serves as a key piece of infrastructure for the County under current operations. The Walenda WBS conveys flow to the Gulf Cove WBS and feeds the 5-MG GST at Rotonda WBS for redistribution to the respective areas. Walenda WBS feeds Rotonda WBS through a dedicated 24-inch transmission main along Gasparilla Road. However, the 24-inch dedicated 5-MG feed line is currently limited by the upstream pipe from the Walenda WBS along El Jobean (SR 776), which is only 16 inches in diameter and also serves as the Myakka River crossing. The 16-inch diameter water main that supplies the 24-inch line to the Rotonda WBS is further restricted by approximately 1,100 feet of 12-inch line that runs across and along SR 776. This line should be up-sized accordingly.

Sodium hypochlorite and ammonium sulfate are injected into the system to maintain proper disinfectant concentrations throughout the distribution system and the GSTs. Each tank is refilled when its level falls below the two-thirds point, unless there is reason for caution, such as during hurricane season. In such emergency situations, each tank is generally kept full.

Sound O&M processes implemented by a well-trained staff maintain the CCU system's integrity. Expected capacity needs are met through careful forecasting of demands and CIP project planning. CCU maintains stationary generators at WBS that are exercised on a weekly routine to ensure reliability. The Water Distribution workgroup is responsible for dozens of operational processes with the common goal of maintaining adequate flow rate, volume, quality, and water pressure to CCU customers. CCU has a proactive training program for its staff. The County uses the industry-recognized University of California/Sacramento study books to assist staff in obtaining their operator licenses. CCU requires staff to take the course before sitting for the State certification tests.

4.1.6 Water Report

CCU maintains monthly water data for its Port Charlotte PWS, which totalizes water into the distribution system and distinguishes domestic and non-domestic water usage to estimate unaccounted-for water volumes. Table 4-4 shows the results tracked during FY 2023 for the Port Charlotte PWS. The table compares the water received from the PRF to the sum of the total water billed to customers, water for distribution system flushing and fire department uses, and water loss due to identified leaks and breaks.

Table 4-4 CCU Unaccountable Water Report (Port Charlotte PWS) FY 2023

Month	Total Metered Water (gal)	Sold (gal)	Construction Flushing (gal)	Hydrant Flushing (gal)	Construction Fill (gal)	Line Breaks (gal)	Fire Fighting (gal)	Unaccounted-for Water Loss[1] (gal)
Oct-22	366,952,000	229,378,000	83,375	9,591,500	5,645	3,003,380	50,000	124,840,100
Nov-22	330,425,000	332,071,000	6,750	17,715,500	0	1,952,280	50,000	-21,370,530
Dec-22	349,181,000	266,447,000	78	21,262,900	1,663	1,056,610	50,000	60,362,749
Jan-23	369,068,000	336,785,000	130,000	23,116,450	9,609	631,821	50,000	8,345,120
Feb-23	365,058,000	301,499,000	0	21,895,670	0	577,307	50,000	41,036,023
Mar-23	423,699,000	378,919,000	1,153,125	24,636,700	140	761,340	50,000	18,178,695
Apr-23	406,282,000	336,844,000	11,312	29,652,280	6,412	1,391,965	50,000	38,326,031
May-23	405,168,000	319,901,000	33,260	26,761,685	822	598,190	50,000	57,823,043
Jun-23	362,018,000	322,415,000	12,060	16,996,940	0	859,635	50,000	21,684,365
Jul-23	368,677,000	323,084,000	77,585	12,260,260	331	1,884,789	50,000	31,320,035
Aug-23	362,978,000	281,534,000	306,690	17,753,665	13,745	3,075,015	50,000	60,244,885
Sep-23	358,592,000	312,832,000	22,250	33,8912,890	176	2,263,545	50,000	9,611,139
Total (gal)	4,468,098,000	3,741,709,000	1,836,485	255,456,440	38,543	18,055,877	600,000	450,401,655
Monthly Average (gal)	**372,341,500**	**311,809,083**	**153,040**	**21,288,037**	**3,212**	**1,504,656**	**50,000**	**37,533,471**

Note: [1] Negative monthly water loss occurs because the meters are not read on the same day every month.

CCU estimates the quantity of water used for flushing the distribution system water lines by the size of the outlet and amount of time flushing has occurred. Public water system FAC regulations require a minimum free chlorine residual of 0.2 part per million (ppm), or a minimum combined chlorine residual of 0.6 ppm throughout the distribution system at all times. Most of the flushing water used is to maintain chlorine residual levels in the distant, isolated parts of the distribution system.

Water loss due to line breaks are estimated based on the pressure in the line before the break and the size of the pipe. At present, most main breaks are caused by contractors excavating for other utility installations or by aging pipe in the system. For example, new telephone systems are being changed from copper to fiber, new electricity poles are being installed, and underground lines are replacing old pole lines. Loss due to line breaks are estimated at approximately 1.5 MG per month, which is about 0.4 percent of the total FY 2023 water use.

The unaccounted-for water loss column is the total metered water (Column 2) minus the sum of the known usages (Columns 3 through 8). The unaccounted-for water in the CCU Port Charlotte PWS for FY 2023 was approximately 37.5 MG per month, or 10.1 percent. For reference, SWFWMD requires a water audit to be completed during any *calendar year* where water losses of 10 percent or higher are reported in Public Supply Annual Reports (PSARs); note that the information provided in Table 4-4 covers *fiscal year* 2023. Unaccounted-for water loss for October 2022 was abnormally high due to impacts from Hurricane Ian, which significantly increased the total FY 2023 unaccounted-for water loss amount and percentage.

4.2 Burnt Store Water Distribution System

The CCU Burnt Store PWS is wholly separated physically and geographically from the Port Charlotte PWS, as shown in Figure 3-1. It is owned and operated by CCU. The current service area is concentrated in approximately 8 square miles in the south part of Charlotte County and approximately 2 square miles in north Lee County along the county border.

The system serves the nearly built-out Burnt Store Marina residential development in Lee County and the sparsely populated but growing residential developments along Burnt Store Road and Tuckers Grade to the northwest. The water is produced by the CCU-owned Burnt Store RO WTP.

Based on existing GIS data at the time of this report, the Burnt Store PWS consists of 74 miles of water main ranging in size from 2- to 24-inch diameter. Water main installations are expected to continue north and south of the WTP extending toward Punta Gorda and into Lee County, respectively. Approximately 319 fire hydrants are throughout the Burnt Store PWS.

4.2.1 Interconnects

The Burnt Store PWS does not have interconnects with neighboring utilities. However, as identified in the Potable Water Master Plan, CCU is considering options to interconnect South County to other systems, such as the City of Punta Gorda or the Authority. If an interconnect is established, CCU may need to convert to chloramine disinfection and/or provide a separate transmission line from the future Babcock facility to maintain a free chlorination system.

4.2.2 WATER BOOSTER STATIONS

Due to the relatively small service population of the Burnt Store PWS, the system has no booster stations or disinfection injection points. All of the chemicals and pumps are at the Burnt Store RO WTP. However, a WBS improvement near Heritage Landing was identified in the Water Master Plan to address future growth.

4.2.3 STORAGE

The water storage for the Burnt Store PWS is at the Burnt Store RO WTP; no additional storage is provided within the Burnt Store PWS. However, an elevated storage tank improvement near Tuckers Grade was identified in the Potable Water Master Plan to address future growth.

4.2.4 OPERATIONS

Treated water from the Burnt Store RO WTP enters the South County service area through a 20-inch transmission main. The transmission system divides into 16-inch north and 16-inch south transmission pipes within the Burnt Store Road right-of-way. CCU maintains a stationary generator on site that is exercised on a weekly routine to ensure reliability.

As with the Port Charlotte PWS, forecasting and capital improvements planning are conducted for the Burnt Store PWS. The Water Distribution workgroup is also responsible for maintaining adequate flow rate, volume, quality, and pressure to the South County CCU customers.

4.2.5 WATER AUDIT

CCU maintains monthly water data for its Burnt Store PWS which totalizes water into the distribution system and distinguishes domestic and non-domestic water usage to estimate unaccounted-for water volumes. Table 4-5 shows the results tracked during FY 2023 for the Burnt Store PWS. The data compares the water passing through the discharge meter at the Burnt Store RO WTP to the sum of total water billed to customers, water for distribution system flushing and fire department uses, and water loss due to identified leaks and breaks.

CCU estimates the quantity of water used for flushing the distribution system water lines by the size of the outlet and amount of time flushing has occurred. Water regulations require a minimum free chlorine residual throughout the system of 0.2 ppm. A large portion of the flushing water is used to maintain chlorine residual levels in the distant isolated parts of the distribution system.

At present, most main breaks are caused by contractors excavating for other utility installations or by aging pipe in the system. The Burnt Store PWS has experienced line breaks due to pressure surges in the system. The system includes old PVC water pipes that are thinner than the current CCU standard PVC water pipes. The thinner pipes are more brittle and susceptible to breakage. The pumps that pressurize the Burnt Store PWS have been modified with VFDs to reduce pressure surges.

The unaccounted-for water loss column is the total metered water (Column 2) minus the sum of the known uses (Columns 3 through 8). The unaccounted-for water loss percentage for FY 2023 was approximately 17.1 percent for the Burnt Store PWS. For reference, SWFWMD requires a water audit to be completed during any *calendar year* where water losses of 10 percent or higher are reported in PSARs; note that the information provided in Table 4-5 covers *fiscal year* 2023.

Table 4-5 CCU Unaccountable Water Report (Burnt Store PWS) FY 2023

Month	Total Metered Water (gal)	Sold (gal)	Construction Flushing (gal)	Hydrant Flushing (gal)	Construction Fill (gal)	Line Breaks (gal)	Fire Fighting (gal)	Unaccounted -for Water Loss (gal)
Oct-22	22,206,720	13,162,000	0	5,000	0	446,460	10,000	8,583,260
Nov-22	19,634,752	14,139,000	0	104,000	0	14,780	10,000	5,366,972
Dec-22	20,546,176	13,244,000	0	22,500	0	944,200	10,000	6,325,476
Jan-23	21,824,640	19,338,000	0	5,000	0	75,900	10,000	2,395,000
Feb-23	21,883,648	19,955,000	0	7,500	0	626,880	10,000	1,284,268
Mar-23	28,184,576	24,710,000	0	7,500	0	203,605	10,000	3,253,471
Apr-23	24,326,288	21,007,000	0	9,250	0	300,490	10,000	2,999,548
May-23	23,381,251	19,458,000	0	15,000	0	47,425	10,000	3,850,826
Jun-23	20,992,637	18,436,000	0	47,500	0	798,830	10,000	1,700,307
Jul-23	24,587,648	18,897,000	0	117,375	0	768,900	10,000	4,794,373
Aug-23	21,799,168	16,928,000	0	117,850	7,103	531,260	10,000	4,204,955
Sep-23	19,775,616	16,569,000	0	24,000	0	1,951,710	10,000	1,220,906
Total (gal)	269,143,120	215,843,000	0	482,475	7,103	6,710,440	120,000	45,980,102
Monthly Average (gal)	**22,428,593**	**17,986,917**	**0**	**40,206**	**592**	**559,203**	**10,000**	**3,831,675**

CCU is well aware of high water loss percentages that have been historically tracked for the Burnt Store PWS. CCU has taken several steps to evaluate and reduce water losses in the Burnt Store PWS but has not been able to reduce losses to under 10 percent despite those efforts. CCU has worked directly with SWFWMD to determine potential causes for the high water loss and take actions to address it, including:

- Completed a water-loss-reduction plan in 2015.
- Completed a water-loss investigation report in 2021.
- Developed initiative to replace aged non-PVC and antiquated-class PVC pipe with new C-900 PVC pipe, and developed a standard to prioritize C-900 PVC pipe over other pipe materials.
- Installed new fixed-base meters in every residential water service and checked the accuracy of the commercial water meters.
- Performed a leak analysis throughout the Burnt Store PWS.
- Reduced the operating pressure of the system to reduce leaks.
- Continued to investigate the water loss issue by checking the accuracy of the meters and water accounting system.

4.3 MAINTENANCE

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. An example of a CCU predictive maintenance procedure occurs during the daily inspection of large stations. While at the station, the operator takes infrared readings on motors and other components to measure abnormally high temperature readings. In doing so, an impending failure can be averted by addressing the cause of the temperature spike. Predictive maintenance is most suitable for equipment that is in essentially continuous operation, where abrupt failure would prove detrimental.

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 happens 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.

4.3.1 WORK ORDERS

Maintenance begins with a work order (WO). Predictive and preventive WOs are generated by staff, so there is flexibility as to when they are performed. They are scheduled at such a time to be most efficient in terms of the availability of resources, especially labor and in-stock parts.

Corrective WOs are usually generated by a customer phone call. During normal office hours, a CCU dispatcher documents the information and contacts the appropriate Field Supervisor to respond. During off-hours, an answering service records the information and contacts the

on-call line technician for response. The on-call line technician has the resources to organize a four-person crew after hours, if needed. The level of service, from the customer's perspective, is that a live voice will respond to an emergency call 24 hours a day, 7 days a week. Some corrective WOs are generated by a telemetered alarm when certain parameters are breached, for example, low system pressure. The telemetry system sends a message to the cell phone of the Chief Operator, who deploys the required staff. This procedure allows a problem to be addressed before a loss or reduction of service to the customer occurs.

The response time by the repair crew, even to the farthest point of the service area, is less than 45 minutes. This level of service is maintained in part by distributing crews geographically to reduce response distance. To maintain this level of service during off-hours, emergency staff is equipped with cell phones to expedite communication and wireless-enabled laptop computers. Every crew is in a vehicle equipped with the materials and tools to perform a wide range of maintenance activities, reducing the need for trips to the warehouse. In addition, warehouse personnel are on call 24/7 and are equipped to deliver materials and parts as needed.

4.3.2 Data Management

WOs generate valuable data that can be used to improve O&M based on actual performance. Historically, data have been maintained in several media, including electronic and paper based, so retrieval is not always easy. This condition was greatly improved with the County's implementation of a computerized maintenance management system. Known as an EAMS, it allows data to be stored on a file server and accessible to authorized users. The system has standard reports, but custom reports can be created for specific purposes. EAMS has greatly reduced paperwork and improved efficiency. The system continues to be expanded to other County departments, and staff training continues. A County-wide evaluation of current needs is underway to revise or replace the EAMS.

Information being maintained includes costs to complete a WO in terms of labor, parts, and equipment use, including vehicles and outside contractors, if needed. The data can be used to generate budgets, evaluate the efficiency of processes and particular components of equipment, perform "what-if" scenarios, and conduct many other analyses that were too cumbersome to perform in the past.

4.3.3 Maintenance Activities

The CCU Water Distribution staff perform daily visual inspections, water-quality tests, and temperature checks at each of the booster stations. In addition, each booster station is visited at least monthly to perform mechanical and electrical tests, greasing, and lubrication. Staff perform repairs and replacement of booster station pumps and motors, rather than relying on outsourced services that are expensive and not as responsive. Each in-service booster station has a portable gantry on-site to enable pumping units and motors to be pulled and replaced quickly. Due to these maintenance practices, the booster stations and especially the pumps are kept operating efficiently.

As part of ongoing maintenance, CCU periodically tests water meters for accuracy. The water meters are maintained and warranted for a 20-year replacement cycle. The existing design standards for pipes, valves, and hydrants allow the maintenance staff to be more efficient and cost-effective in maintaining the system. Water valves have been surveyed using a global

positioning system (GPS), which allows any valve to be quickly located if it needs to be shut off. Staff regularly exercise hydrants and system valves to increase reliability. Large water meters are checked for accuracy yearly and repairs are conducted when necessary.

Maintenance activities for FY 2023 in both County distribution systems included:

- Completed 7,579 WOs within the distribution systems.
- Responded to 200 water-quality calls and 1,623 customer calls for leaks.
- Repaired 148 hydrants, installed 125 new hydrants, and performed maintenance on 654 hydrants, including exercising, flow testing, and painting.
- Issued and addressed 80 boil water notices and repaired 87 line breaks on pipes 3 inches or larger.
- Replaced 15 valves and performed maintenance on 976 valves.
- Tested 95 large meters and 3,347 small meters.
- Repaired all fencing damaged at WBSs due to Hurricane Ian, with the exception of the EWD WBS.

4.3.4 Staff Training and Employee Retention

CCU encourages employees and staff members to participate in training activities to maintain license requirements and attract superior staff among a competitive labor market. The following training has been conducted by CCU staff recently:

- Thirty-seven employees completed a 4-hour Asbestos Field Staff Training class.
- Fourteen employees completed an 8-hour Asbestos Supervisor Training class.
- Nine Employees completed a 5-day Asbestos Supervisor Training course.
- Seven employees completed an 8-hour Asbestos OSHA Training class.
- Four employees completed CDL -A -related permitting and classwork.
- Two employees completed a 90-hour APWA Supervisor and Management program.

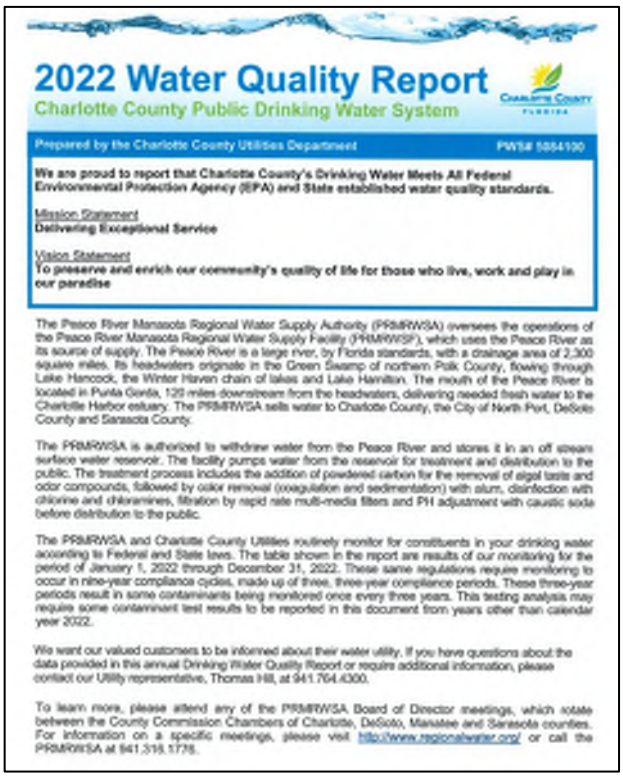
As with many organizations, maintaining the proper number of staff is required to complete the maintenance activities that accompany the management of a distribution system. In FY 2023, the following staffing changes occurred:

- Overall, there were 46 new hires with 36 retaining their positions.
- A Grants Project Manager was hired.
- Process Improvement Manager, a new position, was approved and hired.
- Engineering Construction Manager, a new position, was approved and hired. The Project Managers for Construction Services now report directly to the Engineering Construction Manager. The Construction Services Manager no longer manages the project managers but manages non-manager staff members in Construction Services.
- A field supervisor and associated staff was shifted from Engineering to Operations.
- New Project Manager and Program Coordinator positions under the Operations Manager were approved and hired.
- A new Program Coordinator positions under the Treatment Facilities Superintendent was approved and hired.
- Under Operations, the Reclaimed and Support Services Superintendent position was eliminated and replaced by a new position for Maintenance Supervisor.
- Several Billing Specialist positions were added under Business Services division.

- Three vacant field staff positions were filled for the Vacuum Sewer System.
- Seven vacant field staff positions were filled for the Wastewater Collection System.

4.4 Consumer Confidence Reports

As required by federal and state regulations for utilities, CCU provides accessibility to every customer to view electronically or obtain a hard copy of the annual water-quality report, also known as the Consumer Confidence Report (CCR). The report tabulates the results of water-quality testing to identify the level of any contaminants specified by primary and secondary drinking water standards that are detected in the drinking water. Potable water, including bottled water, typically originates from rivers, lakes, streams, ponds, reservoirs, springs, or wells. As water travels over land or through the ground, it dissolves naturally occurring minerals and can also absorb substances that originate from animal or human activity. These contaminants may include:



2022 Water Quality Report

Charlotte County Public Drinking Water System

Prepared by the Charlotte County Utilities Department PWS# 5084100

We are proud to report that Charlotte County's Drinking Water Meets All Federal Environmental Protection Agency (EPA) and State established water quality standards.

Mission Statement
Delivering Exceptional Service

Vision Statement
To preserve and enrich our community's quality of life for those who live, work and play in our paradise

The Peace River Manasota Regional Water Supply Authority (PRMRWSA) oversees the operations of the Peace River Manasota Regional Water Supply Facility (PRMRWSF), which uses the Peace River as its source of supply. The Peace River is a large river, by Florida standards, with a drainage area of 2,300 square miles. Its headwaters originate in the Green Swamp of northern Polk County, flowing through Lake Hancock, the Winter Haven chain of lakes and Lake Hamilton. The mouth of the Peace River is located in Punta Gorda, 120 miles downstream from the headwaters, delivering needed fresh water to the Charlotte Harbor estuary. The PRMRWSA sells water to Charlotte County, the City of North Port, DeSoto County and Sarasota County.

The PRMRWSA is authorized to withdraw water from the Peace River and stores it in an off stream surface water reservoir. The facility pumps water from the reservoir for treatment and distribution to the public. The treatment process includes the addition of powdered carbon for the removal of algal taste and odor compounds, followed by color removal (coagulation and sedimentation) with alum, disinfection with chlorine and chloramines, filtration by rapid rate multi-media filters and PH adjustment with caustic soda before distribution to the public.

The PRMRWSA and Charlotte County Utilities routinely monitor for constituents in your drinking water according to Federal and State laws. The table shown in the report are results of our monitoring for the period of January 1, 2022 through December 31, 2022. These same regulations require monitoring to occur in nine-year compliance cycles, made up of three, three-year compliance periods. These three-year periods result in some contaminants being monitored once every three years. This testing analysis may require some contaminant test results to be reported in this document from years other than calendar year 2022.

We want our valued customers to be informed about their water utility. If you have questions about the data provided in this annual Drinking Water Quality Report or require additional information, please contact our Utility representative, Thomas Hill, at 941.764.4300.

To learn more, please attend any of the PRMRWSA Board of Director meetings, which rotate between the County Commission Chambers of Charlotte, DeSoto, Manatee and Sarasota counties. For information on a specific meetings, please visit http://www.regionalwater.org/ or call the PRMRWSA at 941.316.1776.

- Microbial contaminants, such as viruses and bacteria.
- Inorganic contaminants, such as salts, metals, pesticides, and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals.
- Radioactive contaminants, which can be naturally occurring.

To ensure that tap water is safe to drink, EPA regulations limit the concentrations of certain contaminants in water provided by PWSs. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.

The results, as reported in the latest CCRs for the Port Charlotte and South County distribution systems, indicate the levels of tested water contaminants in the CCU service area are safely below the maximum contaminant level allowed by federal and state regulations and orders and in most cases are well below the level.

The most recent CCRs for the Port Charlotte and Burnt Store PWSs are available at *https://www.charlottecountyfl.gov/departments/utilities/about-utilities/conservation/*.

4.5 Review of Previous Recommendations

Table 4-6 and Table 4-7 summarize the recommendations and status from the 2022 Annual Report for the Port Charlotte and Burnt Store PWSs, respectively. Table 4-8 summarizes the general recommendations that apply to both distribution systems.

Table 4-6 Port Charlotte PWS– 2022 Recommendations and Status

	Interconnects
Recommendations:	1. Lower the lighting fixtures under the canopy to illuminate the pumps and equipment at the EWD interconnect. 2. Add an intrusion alarm to the CCU radio telemetry units (RTU) panels.[1] 3. Install bollards around the equipment.[1]
Progress:	1. Station under Hurricane Ian repairs. 2. Not Completed. 3. Ongoing.
	WBS General
Recommendations:	1. Complete load studies and arc-flash labeling for electrical equipment to comply with NFPA 70E. 2. Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds. 3. Complete construction of the new O'Hara WBS and place the new WBS into service. This improvement was identified in the Potable Water Master Plan as a water quality improvement that would significantly reduce flushing. 4. Begin designing the new Robin WBS and place the new WBS into service. This improvement was identified in the Potable Water Master Plan as a water quality improvement that would significantly reduce flushing.
Progress:	1. In Progress. 2. Ongoing. 3. Bid received but project put on hold. 4. In Progress.
	Port Charlotte Golf Course WBS
Recommendations:	1. Perform yard maintenance around the perimeter fencing.[1] 2. Clearly label chemical storage tanks and fill valves.[1] 3. Label the switchgear to identify parts and components that could be energized.
Progress:	1. Ongoing. 2. Completed. 3. Completed.

	Walenda WBS
Recommendations:	1. Complete the generator replacement project at the WBS, including a new generator and fuel tank designed above the floodplain. 2. Continue to monitor the electrical system performance to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project. 3. Perform yard maintenance around the perimeter fencing.[1] 4. Trim tree limbs on the northwest corner of the pump room.[1] 5. Install bollards around the WBS effluent pipe.[1] 6. Clearly label chemical storage tanks and fill valves.[1] 7. Add additional signage indicating "No Trespassing, Violators will be Prosecuted" along fencing.[1]
Progress:	1. Not Completed. 2. Ongoing. 3. Ongoing. 4. Not Completed. 5. Completed. 6. Completed. 7. Security fence upgrade complete.
	Gulf Cove WBS
Recommendations:	1. Complete HSP #2 repairs and place pump back into service. 2. Complete the generator replacement project at the WBS, including a new generator and fuel tank designed at or above the 100-year floodplain elevation. 3. Replace the concrete pipe connecting the GST to the pump station at the WBS. 4. Continue to monitor the electrical system performance to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project. 5. Replace the exhaust fan in the ammonia chemical feed room. 6. Properly secure the pressure transducer at the back of the GST. 7. Replace the corroded copper sodium hypochlorite chemical injection quill with a Schedule 80 material. 8. Pump out the water in the vault containing the HSP feed piping. 9. Secure the electrical conduit for the newly installed cameras. 10. Repaint the pump building. 11. Continue to monitor water quality entering the WBS.[1]
Progress:	1. Completed. 2. In Progress. 3. Design project in progress. 4. Ongoing. 5. Not Completed. 6. Completed. 7. Not Completed. 8. Ongoing. 9. Completed. 10. Not Completed. 11. Ongoing
	Ingraham Disinfection Station
Recommendation:	▪ Clearly label the chemical storage tanks.

Progress:	Completed.
Recommendations:	Rotonda WBS 1. Replace approximately 1,100 feet of 12-inch piping restricting the flow/capacity of the 24-inch line (from the tank to just north of Conway Road) feeding the Rotonda water booster tank. 2. Continue to monitor the electrical system performance to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project. 3. Develop a standard schedule for tank-filling operations. 4. Paint the wall that contains the HMI in the pump room. 5. Replace the incoming main breaker as soon as possible. The failure of this specific device may render the station out of service for an extended period. 6. The gaps surrounding the VFDs should be mitigated to prevent potential contact with live parts. 7. Install bollards around the monitoring equipment.[1] 8. Clearly label chemical storage tanks and fill valves.[1] 9. Develop an ERP for WBS bypass and operations without the laboratory and control room.[1]
Progress:	1. Scheduled for completion. 2. Ongoing. 3. Completed. 4. In Progress. 5. Completed. 6. Not completed. 7. Completed. 8. Partially completed. 9. Not completed.

Note: [1] Recommendation from RRA Report (March 2020).

Table 4-7 Burnt Store PWS – 2022 Recommendations and Status

Recommendation:	Continue to replace old "class" PVC pipe in the distribution system with new C-900 PVC pipe.
Progress:	Ongoing.
Recommendation:	Continue developing a computerized hydraulic model for the South County distribution system.
Progress:	Ongoing.
Recommendation:	Investigate the feasibility of installing interconnects with neighboring utilities.[1]
Progress:	Ongoing.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Progress:	Ongoing.

Note: [1] Recommendation from RRA Report (March 2020).

Table 4-8 General Distribution System – 2022 Recommendations and Status

Recommendation:	Continue to update the water system hydraulic computer model and use it as a planning tool for future water system improvements.
Progress:	Ongoing.
Recommendation:	Continue the AMI Water Meter Replacement Program.
Progress:	Ongoing.
Recommendation:	Continue to integrate acquired utilities into the overall CCU water system to maximize reliability and reduce costs to CCU customers.
Progress:	Ongoing.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps for improved water distribution to customers.
Progress:	Ongoing.
Recommendation:	Continue to develop and update water quality models for each distribution system for use in ongoing development reviews.
Progress:	Ongoing.
Recommendation:	Create a water system O&M Manual and operating protocols.
Progress:	In Progress.
Recommendation:	Develop a best management practice plan to standardize pump and motor sizing across CCU pumping facilities to better facilitate maintenance and replacement of equipment.
Progress:	In progress.

5 WASTEWATER COLLECTION SYSTEM

5.1 SEWER SYSTEMS

The purpose of a wastewater collection system is to transport wastewater from customer structures to a treatment facility. The CCU collection system consists of the following components:

- **Gravity Sewer** – as the name implies, is piping installed at a gradual incline (slope) that allows wastewater to flow exclusively by the energy of gravity. Gravity sewers include manholes that allow maintenance staff entry and equipment use. Flow entering gravity sewers discharges to manholes, lift stations, or a treatment plant.
- **Vacuum Sewer** – moves sewage from an individual service wastewater storage tank to a wastewater pumping station by a vacuum that is created at a pumping station site. This system uses smaller-diameter pipes than a gravity sewer system.
- **Low-Pressure Sewer (LPS)** — is an alternative to a gravity sewer system and requires a small pump at each property. This system costs less to construct (smaller-diameter pipes, shallow-depth piping) but costs more to operate and maintain (electrically driven equipment). Flows within an LPS system move only when pushed by new flow contributions.
- **Force Main** – is a pressured sewer pipe that conveys wastewater in a situation where gravity sewer flow is not possible. This system component is fed by a lift station.
- **Lift Station (LS)** – also referred to as pump station, is a facility designed to move wastewater from lower to higher elevations through force mains. This system component provides additional energy to the system where reliance on gravity is not possible. Lift stations are common in Florida because of the flat terrain.
- **Vacuum Station (VS)** – houses a collection tank, discharge pumps to send the sewage to the treatment plant, controls to automate the station, and vacuum pumps that create a negative pressure in the vacuum mains.

CCU's service area is served by four collection systems. Each system is tributary to a WRF, discussed further in Chapter 6. Figure 5-1 shows the CCU certificated service area and wastewater collection system infrastructure.

At the end of FY 2023, CCU had 46,037 wastewater customers, an increase of 2,105 customers since FY 2022. Based primarily on CCU GIS data, the wastewater collection system primarily features the following approximated inventory:

- 512 miles of gravity sewer.
- 409 miles of low-pressure sewer.
- 202 miles of force main.
- 45 miles of vacuum sewer.
- 4 vacuum stations.
- 310 lift stations (owned by CCU).
- 8,100 manholes.

Figure 5-1

CCU Wastewater Collection Systems

Legend

- Treatment Plant
- LPS System
- Lift Station
- Vacuum Station
- SS Pressurized Main
- SS Low Pressure Main
- SS Gravity Main
- VA Pressurized Main
- CCU WW Service Area

N
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Feet
1:150,000

JonesEdmunds

For Informational Purposes Only J:\project_Data\03405_Charlotte\MasterPlanGIS\Sewer\Pro\MasterPlanFigures_Temp.aprx rkopp 3/15/2024

5.1.1 System Expansion

CCU has developed hydraulic models (SewerGEMS™) for the South, Mid, and West County wastewater systems that have been improved and maintained by the County and various consultants over the years. The models have been incrementally and continuously updated with respect to new developments, infrastructure changes, construction projects, and other information sourced by the County. The models are used to identify areas where capacity upgrades are needed to support future growth, as well as upgrades needed for future system expansions.

Currently, Jones Edmunds is under contract with the County to update and maintain the models and evaluate hydraulic impacts from CIP projects and service connections to new developments. Wastewater modeling efforts in FY 2023 involved evaluating the new Tuckers Pointe, Starling, and Simple Life developments; the Heritage Landing and Tuckers Pointe Master LSs in South County; the new Cove and Harbor Village developments and SR 776 force main improvements in West County; and the Edgewater-Flamingo force main improvements in Mid County.

5.2 Lift Stations

CCU owns and maintains a total of 310 LSs and outsources maintenance and repair for 14 Charlotte-County-affiliated LSs through service contracts within Charlotte County. VSs are not included in the lift station count; Section 5.3 discusses the VSs. For auxiliary power (also known as backup power), 30 stationary generators are installed at various LSs. CCU staff diligently exercises these stationary generators on a once-weekly routine schedule. In addition, CCU also has available 23 trailer-mounted generators (ranging from 30 to 180 kW) and 10 portable hand-held generators (15 kW) that can be used at portable generator receptacles located on LS control panels.

In recent years, CCU has taken significant strides to provide more resilience to their wastewater collection system, in large part due to FEMA grant funding agreements that the County has acquired to secure additional generators. CCU has now implemented stationary generators into new and rehabilitated LS designs as a standard feature, when necessary, based on the criticality of failure. As an additional safeguard, most LSs also include dedicated discharge and/or suction connections on site for emergency transfer of flow using temporary or mobile pumping systems.

Jones Edmunds personnel and CCU Operations staff conducted site visits on January 31, 2024, through February 2, 2024, to three Master LSs, 15 representative LSs, and three VSs, as selected by CCU staff. In addition to the standard assessments, electrical condition assessments were separately conducted for the South Port Master LS-65 and the El Jobean VS-3. In summary, four Master LSs, 15 representative LSs, and four VSs were visited. The CCU-selected stations were dispersed throughout the County's Deep Creek, Port Charlotte (Mid County), and Rotonda and Gulf Cove (West County) wastewater service areas. The LSs are selected as based on existing conditions, infrastructure needs, and considering current, past, and future wastewater collection and transmission improvement projects; typically, a balance of recently improved lift stations and those in need of rehabilitation are requested for inspection and documentation.

Damage to the lift stations was incurred from Hurricane Ian in September 2022, primarily substantial damage to fencing and telemetry antennas. The County is pursuing FEMA funding to complete these hurricane-related damages. Although damage is noted throughout this Chapter, it is understood that some portions are hurricane-related damage with repairs pending funding from FEMA.

Table 5-1 lists the 19 LSs visited; Section 5.3 addresses the VSs. The site-visit assessments will help CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these LSs.

Table 5-1 Field Inspections for Master and Representative LS

Station No.	Location
Master LS-65 South Port (Elec. Only)	4157 Tamiami Trail (Behind Advance Auto Parts)
Master LS-309 Bridgewater	Bridgewater Road and Newcastle Lane
Master LS-321 Angol	132 Angol Street
Master LS-815 "Z"	Parade Circle and Oakland Hills Road
LS-1 Community Center	Orange Street and Easy Street
LS-2 Dalton	Sharon Circle and Dalton Boulevard
LS-6 Higgs	Salem Avenue and Higgs Drive
LS-7 Pure Oil	Tamiami Trail and Easy Street
LS-19 Port Charlotte High School	Port Charlotte High School and Port Charlotte Town Center
LS-24 Charlotte Square	Forrest Nelson Boulevard and Tamiami Trail
LS-25 Vo-Tech	Murdock Circle and Education Way
LS-44 Liberty Elementary	Wilkie Avenue and Atwater Street
LS-45 Woodbury	Paulson Drive and Woodbury Drive
LS-809 Placida Harbour	Gaspar Drive and Placida Road
LS-812 Annapolis	Across from 226 Annapolis Lane
LS-813 Marina	Golfview Road and Rotonda Circle
LS-818 Harbor West	14613 Ponce De Leon Trail
LS-819 Rotonda Circle #1	Bunker Road and Rotonda Circle
LS-821 Rebel Court	Rebel Court and Bonita Drive

5.2.1 Master LS-65 South Port (Electrical Only)

This section will only include details specific to the electrical condition assessment of South Port Master LS-65 conducted as part of the FY 2023 Annual Report. A standard Annual Report condition assessment of the South Port Master LS-65 was completed in the FY 2020 Annual Report, including the non-electrical components, deficiencies identified, and improvement recommendations; see 2020 Annual Report for details. Overall, four facilities were selected by CCU staff for the FY 2023 Annual Report for electrical-specific condition assessment by Jones Edmunds electrical engineering staff; the selected facilities included:

- Rotonda WRF.
- South Port Master Lift Station (LS-65).
- El Jobean Vacuum Station (VS-3).
- Golf Course WBS.

The electrical engineer conducted the above site visits on Wednesday, February 28, 2024. No major issues were identified or reported by CCU operations staff during the site visit.

The following deficiencies were noted:

- Pressure switches on the discharge side of all three pumps have been disabled or removed, but the equipment is still in place and merely abandoned.
- Generator controls are higher than allowed by NEC Code.
- A misused cover with exposed components on the blower MCC cabinet represents a physical hazard.

Proposed improvements to the station include:

- Remove the abandoned pressure switches.
- Make provisions to lower the generator controls height.
- Restore the cover to original condition.

5.2.2 MASTER LS-309 BRIDGEWATER

The Bridgewater Master Lift Station (LS-309) is northwest of the intersection of Bridgewater Road and Newcastle Lane. This station, purchased by Charlotte County in 2003, receives wastewater from numerous County-owned lift stations in the Deep Creek Area, a small number of private lift stations, and an elementary school. The station discharges through an 8-inch force main that conveys flow to the East Port WRF. After the new Deep Creek force main was constructed, this station reportedly reduced its wastewater flow by approximately half. This station received significant upgrades in 2022.

The station contains two recently replaced pumps in 2022 – each 25-HP Flygt Model NP3171.095 submersible pumps with 436-millimeter (mm) impellers. The pumps are in a 10-foot-8-inch-diameter, 20-foot-9-inch-deep concrete wetwell. Each pump has an estimated capacity of 550 gpm at approximately 35 feet of head.

The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 2-inch cylindrical rail-retrieval system. Being last coated in the 1980s, the wetwell was in fair condition, exhibiting signs of corrosion. Two additional floats were installed in FY 2022 for additional redundancy and pump control. The discharge piping includes 8-inch Dezurik plug valves, 8-inch Kennedy check valves, and dedicated discharge in an underground concrete vault north of the wetwell. The pump discharge check valves are in poor condition due to wear, are sticking, and require repair and/or replacement. The operator noted replacement of check lever arms and valve reseating is planned to address the issue. In general, the piping and valves in the valve vault are showing signs of

corrosion. Additionally, the station currently has an above-grade bypass piping configuration installed to the dedicated discharge connection from the valve vault, with a camlock connection at the exterior fence line for access from the adjacent vacant lot.

A Siemens Whisper biological odor-control unit with a fan draws air from the wetwell and reduces the hydrogen sulfide odor generated. The unit includes a scrubber tower that uses water injection with nitrate and anti-algae additives. The station receives wastewater with long detention times in numerous tributary pumping stations. The concrete around the odor-control system is showing signs of significant concrete wear and cracks.

The station is fenced with barbed wire, although notable barbed wire damage is apparent. We also observed gaps between the gravel and the bottom of the fence in some areas that create easy access for small animals. Power is provided by a 480-volt, three-phase power service with a pole-mounted transformer. The station has a DFS TCU SCADA system with a telemetry transmitter/receiver.

The pumps are started without the use of VFDs or soft starts. A new control panel, permanent stationary generator, and ATS were installed in FY 2022. The control panel is equipped with seal-offs. The generator is an 83-kW Kohler rated at 104-kVA. It is mounted atop a 576-gallon diesel fuel tank. However, the operator indicated that the generator was still being adjusted to properly notify power transfer to the generator via SCADA. The operator also noted that the Allen-Bradley motor starter for Pump No. 1 had recently been repaired and is functioning properly, suggesting the high-temperature Florida environment as a potential issue. The operator noted poor drainage at the site during rain events, which creates excess flow. The station is equipped with potable water service. The station does not have dedicated site lighting.

The following deficiencies were noted:

- Signs of corrosion on the wetwell interior wall, likely due to high hydrogen sulfide concentration.
- Corrosion of piping and valves in the underground vault.
- Gaps in the fence, allowing small animal access.
- Substantial concrete wear and cracks around the odor-control intake piping.
- Generator power transfer not fully operational.
- Barbed-wire fence damage.
- Poor site drainage.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Evaluate the significance of the corrosion to the wetwell.
- Repair or replace the piping and valves in the valve vault.
- Re-establish the grade at the fence line.
- Evaluate the significance of concrete wear and cracks around the odor-control unit.
- Configure SCADA control points for the generator operation.
- Restore the barbed wire to original condition.
- Evaluate alternative drainage options.
- Evaluate incorporating dedicated lift station lighting.

5.2.3 MASTER LS-321 ANGOL

The Angol Master Lift Station (LS-321) is at 132 Angol Street. This master lift station was built in 2006 but received significant upgrades in 2021, including new pumps, electrical, and generator. The station upgrades were very similar to the upgrades completed at MLS 309 Bridgewater. The station receives wastewater from numerous County-owned lift stations in the Deep Creek area. The station discharges through a 10-inch force main that conveys flow to the East Port WRF.

The station now contains two 70-HP Flygt Model NP3202.095 submersible pumps with 458-mm impellers. The wetwell is rectangular with dimensions of 14-feet by 10-feet and a depth of 22-feet-8-inches. Drawdown testing was conducted since the new pumps were installed. Pump No. 1 has an estimated capacity of 2,313 gpm at 62 feet of head, and Pump No. 2 resulted in 2,138 gpm at 73 feet of head.

The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 3-inch cylindrical rail-retrieval system. The wetwell is lined in good-to-fair condition with early signs of corrosion. Two additional floats were installed as part of the station upgrades for additional redundancy and pump control. The dedicated suction and wetwell vent are showing signs of corrosion. The discharge piping is above grade and includes 10-inch Mueller plug valves, 10-inch Kennedy check valves, ARVs, and 6-inch dedicated discharge camlock connection. The discharge appurtenances are in good, operating condition. The discharge force main manifolds to a header where an abandoned flow meter is located.

The station has a hydrogen peroxide chemical injection system for odor-control purposes that has been removed from service and will not be used until further notice. However, a carbon filtration odor-control system still remains. The station is secured with a locked fence and barbed wire; damage to the barbed wire was noted at the time of the site visit. The station receives 480-volt, three-phase power service with a pole-mounted transformer. The control panel is equipped with seal-offs, and the station has a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver. The station now contains a 200-kW Caterpillar generator rated at 250-kVA. It is mounted atop a 1,268-gallon diesel fuel tank that is tested every Monday to ensure the generator is in working condition. The station is equipped with potable water service and dedicated site lighting.

The following deficiencies were noted:

- Signs of corrosion on the wetwell interior wall, likely due to high hydrogen sulfide concentration.
- Signs of corrosion on the wetwell vent and dedicated suction.

- Flow meter out of operation and abandoned in place.
- Barbed wire damage.

Proposed improvements to the station include:

- Evaluate the significance of the corrosion to wetwell.
- Rehabilitate or replace the wetwell vent and dedicated suction.
- Restore flow meter to good operating condition.
- Restore barbed wire to original conditions.

5.2.4 MASTER LS-815 "Z"

The "Z" Master Lift Station (LS-815) is off the gated gravel backroad at the intersection of Parade Circle and Oakland Hills Road and was rehabilitated in FY 2020. This submersible master lift station receives wastewater from numerous lift stations and the surrounding residential area. The station discharges through a 6-inch force main that conveys flow to Master LS-801 and then the Rotonda WRF.

The station contains two 10-HP Flygt Model NP3171.070 submersible pumps with 438-mm impellers. The pumps are in a 10-foot-8-inch-diameter, 20-foot-9-inch-deep concrete wetwell. Each pump has an estimated capacity of 918 gpm at approximately 16 feet of head.

The wetwell hatch is in good condition and provides adequate access to remove the pumps on the 2-inch cylindrical rail-retrieval system. The wetwell is in good condition, exhibiting slight signs of grease with a total of five floats operating in the wetwell. A small crack in the concrete pad next to the wetwell suggests signs of settlement. The discharge piping includes 6-inch Dezurik plug valves, 6-inch Kennedy check valves, and dedicated discharge with a camlock connection. Adjacent to the aboveground discharge piping and valve assembly is the dedicated suction. The valve assembly is in good condition but showing slight signs of paint wear.

The station is equipped with an EVOQUA CAP-25 powder-activated carbon (PAC) odor-control system. Although the system itself appears to be in good condition, corrosion was observed on the concrete pad adjacent to the system.

The station is locked with barbed wire fence that is in excellent condition. Power is provided by a 240-volt, three-phase power service with a pole-mounted transformer. The station contains a DFS TCU SCADA system with a telemetry transmitter/receiver.

The pumps are started without the use of VFDs or soft starts. The station features a control panel, permanent stationary generator, and an ATS. The control panel is equipped with seal-offs The generator is a 36-kW Cummins rated at 45-kVA. It is mounted atop a

277-gallon diesel fuel tank. The operator noted that the generator is tested every Monday to ensure working condition. The station is equipped with potable water service but missing dedicated site lighting.

The following deficiencies were noted:

- Signs of corrosion on the concrete pad adjacent to the odor-control system.
- Crack in concrete pad near the wetwell.
- Slight paint wear on the discharge piping appurtenances.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Evaluate the significance of the corrosion near odor-control system.
- Evaluate the significance of cracks on the concrete pad.
- Evaluate need for painting discharge piping appurtenances.
- Evaluate incorporating dedicated lift station lighting.

5.2.5 Representative Lift Stations Condition Assessments

Jones Edmunds personnel and CCU Operations staff also toured the selected group of neighborhood lift stations on January 31, 2024, through February 2, 2024, to develop a general sense of the overall condition of the lift stations that are within the CCU wastewater collection system. The outcome of the assessment will allow CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these lift stations.

5.2.5.1 LS-1 Community Center

The Community Center lift station (LS-1) is at the southwest corner of the Orange Street and Easy Street intersection. This station receives gravity flows from the local community center and residential area. The station discharges into a 4-inch force main that manifolds into a 6-inch force main that pumps to Master LS-65 South Port, which conveys flow to the East Port WRF. Many portions of this station were observed to be in poor condition and outdated from current standards, but the station appears to be functioning as intended.

Originally built in 1959, LS-1 is housed in a concrete building on an open easement with no fencing. A large amount of insects, feces, and eggs were observed in and around the station. The wall of the structure contains visible cracks. This LS contains two above ground, self-priming, belt-driven pumps, one being a 15-HP Gorman-Rupp model T4A3-B and the other being an All Prime model XS-4. The original Gorman Rupp was installed, in 1980 and the All Prime was installed in 2022. The Gorman Rupp has an estimated capacity of 220 gpm at approximately 65 feet of head and

the All Prime has an estimated capacity of 440 gpm at approximately 28 feet of head. The 13-foot 9-inch deep, 7-foot by 6-foot rectangular wetwell interior shows signs of corrosion from hydrogen sulfide. The wetwell has no ventilation, so emitted gases are contained within the wetwell and the building. One of the wetwell hinges are separated from the wall. The 4-inch Dezurik plug valves and 4-inch ADF and Mueller check valves are located vertically above the pumps.

Power service to the station is 230-volt, three-phase with a pole-mounted transformer. The station has no odor-control system and no dedicated well bypass piping, although a covered square penetration in the wall is directly above the wetwell cover for local pump trucks to access the well for pump out. During storm events when the water level in the wetwell is high, CCU uses tanker trucks to collect and transport excess flows to the WRF. The station has a portable generator receptacle connected to the junction box wall mounted next to the electrical control panel that are outside the building. The control panel does not have seal-offs but does have a mechanical interlock. The control panel housing has been upgraded since the previous condition assessment and is in good condition. The conduit running out of the top of the electric meter was observed to be disconnected and exposed. The station has a DFS Tac II SCADA system with a telemetry transmitter/receiver with built-in phase monitor. The station is equipped with potable water service.

The following deficiencies were noted:

- The concrete building has cracks, including visible daylight through pipe penetrations.
- Signs of corrosion on the wetwell interior wall.
- An access hatch hinge is separated from the wall.
- Notable wear of paint on pumps and piping.
- Conduit running out of the top of the electric meter is no longer connected and exposed.

Proposed improvements to the station include:

- Evaluate replacement of this station to meet current CCU standards. A replacement lift station should also provide the following to address current deficiencies:
    - CCU standard lift station design for a new wetwell and new discharge piping and appurtenances.
    - Electrical controls and panel features to meet CCU standards and electrical codes including an outdoor-rated panel, phase monitors, a surge-protection device (SPD), and seal-offs.
    - SCADA integration.
    - Permanent security fencing to prevent unwanted access and dedicated site lighting for accessibility and safety.
    - Potable water service.

- Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:

    - Seal cracks in building and gaps in pipe penetrations.
    - Evaluate the significance of the corrosion to wetwell.
    - Anchor the access hatch hinge back to the wall.
    - Paint the aboveground pump and discharge piping.
    - Restore and seal the conduit connection to the electric meter.

5.2.5.2 LS-2 Dalton

The Dalton lift station (LS-2) is north of Sharon Circle Park, northwest of the intersection of Sharon Circle and Dalton Boulevard. The station was completely rebuilt in 2021 to the updated CCU LS standards. Previously, this station had a similar layout to LS-1 Community Center with a pump building and suction lift pump design. The newly improved Dalton LS receives wastewater from the surrounding residential area. LS-2 discharges through a 6-inch force main to South Port Master LS-65, which conveys flow to the East Port WRF.

The 8-foot-diameter, 22-foot 2-inch-deep wetwell contains two 5-HP Sulzer model XFP-100C-CB1.4-PE 35/4 submersible pumps with 178-mm impellers with an estimated capacity of 440 gpm at approximately 28 feet of head.

The lined concrete wetwell is in good condition with early signs of corrosion and is vented. The wetwell hatches are in good condition and provide adequate access to remove the pumps on the 2-inch cylindrical rail-retrieval system. The
6-inch Mueller plug valves, 6-inch Kennedy check valves, and dedicated suction and discharge connections are above grade, west of the wetwell and in good condition but showing early signs of paint wear.

Power to the station is 230-volt, three-phase with a pole-mounted transformer feeds the station. No generator is on site, but a portion of the concrete pad is dedicated for future generator installation and usage. The control panel has seal-offs and is equipped with a portable generator receptacle and mechanical interlock. The station is equipped with DFS TCU SCADA system with a telemetry transmitter/receiver with built in phase monitors. The electrical and control panels are in good condition. The station is gated and has barbed wire fencing for security. The barbed wire is showing signs of minor damage. The station is equipped with potable water service and dedicated site lighting.

The following deficiencies were noted:

- Slight paint wear on the discharge piping appurtenances.
- Minor amount of barbed wire damage.

Proposed improvements to the station include:

- Evaluate need for painting discharge piping appurtenances.
- Evaluate need for barbed wire restoration.

5.2.5.3 LS-6 Higgs

The Higgs lift station (LS-6) is across the street from 21184 Higgs Drive near the southwest corner of the intersection of Salem Avenue and Higgs Drive. LS-6 receives gravity flow from the surrounding residential area. LS-6 discharges through a 6-inch force main which ultimately is conveyed to the East Port WRF.

The station contains two 10-HP Flygt Model 3127 submersible pumps with 484-mm impellers in a 6-foot-diameter, 19-foot-11-inch-deep, lined concrete wetwell. Each pump has an estimated capacity of 369 gpm at approximately 46 feet of head (based on the County's drawdown reports). The pumps were noted as not having run times as long or as frequently as they have been experiencing in previous years. The wetwell lining is in good condition and appears to be largely unaffected by hydrogen sulfide. Cracking was noted as present in the square formwork at the top of the well. The wetwell hatches are in good condition. Maintenance access is adequate for removal of the pumps from the 2-inch cylindrical rail-retrieval system. The discharge piping and valve assembly include 6-inch Dezurik plug valves, 6-inch Kennedy check valves, and dedicated discharge connection. The discharge piping appurtenances are in good condition but showing early signs of paint wear.

The station is fenced with barbed wire although small gaps were noted between the fence and gravel. Site lighting is limited to a single light mounted to the communications antennae tower. The station has a Siemens Carbon Adsorber odor-control system. The power service to the station is 240-volt, three-phase with a pole-mounted transformer northeast of the station outside of the fence. The control panel has seal-offs and is equipped with a portable generator receptacle with a mechanical interlock between the main breaker and generator breaker. The station has a DFS Tac II

SCADA system with a telemetry transmitter/receiver. The station is equipped with potable water service.

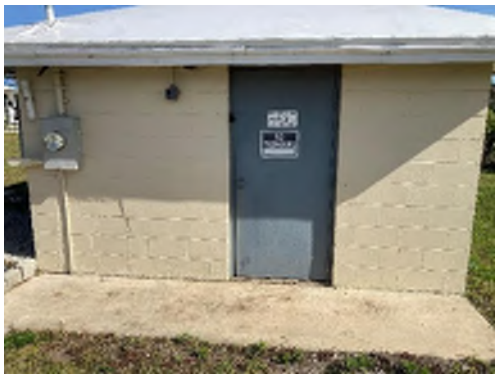
The following deficiencies were noted:

- Adequate lighting is not available for evaluating the control panel or wetwell.
- Eroded rock base along southwest fence line has introduced a slip-and-fall hazard. Noticeable gaps are between the grade and the bottom of the fence in various locations.
- Slight paint wear on the discharge piping appurtenances.
- Cracking was observed in the square formwork at the top of the wetwell.

Proposed improvements to the station include:

- Evaluate site lighting for lift station employee serviceability.
- Re-establish level grade along southwest fence line and along perimeter fence line.
- Evaluate need for painting discharge piping appurtenances.
- Evaluate significance of cracks in concrete formwork at the top of the wetwell.

5.2.5.4 LS-7 Pure Oil



The Pure Oil lift station (LS-7) is north of the gas station on the northeast corner of the intersection of Tamiami Trail and Easy Street. The lift station serves residential and commercial areas to its north and west and discharges into a 4-inch force main, which is conveyed to the East Port WRF.

The station is housed in a concrete building and has a plastic-wrapped roof that is pending roof repairs from damage reported as a result of Hurricane Ian. The station contains two above ground, self-priming, belt-driven 20-HP pumps; one is a Gorman-Rupp model T4A3B pump, and the other is an All Prime model XS-4. The motor and pump for the All Prime configuration have both been replaced recently. The pumps have an estimated capacity of 440 gpm at approximately 50 feet of head. The All Prime discharge was revamped with new 4-inch HDPE and a 4-inch American Flow Control swing check valve with the existing 4-inch Dezurik plug valve. The existing Gorman Rupp discharge has a 4-inch Kennedy check valve and a 4-inch Dezurik plug valve. The Gorman Rupp pump and related discharge piping is showing signs of corrosion. The 12-foot-8-inch-deep, 6-foot-by-13-foot-diameter concrete wetwell is corroded by years of hydrogen sulfide exposure, and metal reinforcement is exposed near the access hatch. The wetwell has an older trough design and is not vented. The station has no odor-control and no dedicated well suction bypass piping, although a circular penetration in the wall directly above the

wetwell cover is available for pump trucks to access. A portable pump connection is in a valve box outside the building. The space inside the building is exposed to sewer gases because access for the wetwell entry and float switches are open holes in the floor of the building.

Power service to the station is 230-volt, three-phase, and a pole-mounted transformer directly west feeds the station. The main control panel is housed in a wooden box mounted outside the building. The station does not include seal-offs on the conduit but does have a mechanical interlock and a portable generator receptacle with a manual transfer switch that was added in recent years. The station has a DFS Tac II SCADA system with a telemetry transmitter/ receiver. Surge protection is provided for SCADA but not for the control panel. Additionally, the surge protection equipment at the telemetry unit is dated; CCU should consider replacement in accordance with current CCU standard LS equipment.

The station is not fenced, and metal reinforcement had to be installed behind the vented window after the plexiglass panels were broken by vandals. The building door and panels are typically locked, and the station has inadequate indoor hang lighting. The County's easement to access the station only extends 10 to 15 feet from the curb and is mostly obstructed with multiple electrical power poles that provide overhead electric. The County currently accesses the station through the parking lot of the adjacent gas station; however, the employee parking, a parked food truck, and a dumpster often partially block this access. Additionally, the nearby overhead power lines present potential danger to County staff when operating a crane truck in this area. A large number of insects was observed at the lift station along with insect feces and eggs inside the control panel box and around the lift station site. The station is equipped with potable water service.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- Obstructed access for a crane truck.
- Existing aerial power supply.
- Corrosion on Gorman Rupp pump.
- Outdated and lack of surge protection observed.
- Inadequate indoor lighting.
- Float terminal blocks are exposed.

Proposed improvements to the station include:

- Evaluate replacement of this station to meet current CCU standards. A replacement lift station should also provide the following to address current deficiencies:
    - CCU standard lift station design for new wetwell and new discharge piping and appurtenances.
    - Electrical controls and panel features to meet CCU standards and electrical codes including outdoor-rated panel, phase monitors, SPD, and seal-offs.
    - SCADA integration.
    - Permanent security fencing to prevent unwanted access and dedicated site lighting for accessibility and safety.
    - Potable water service.

- Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:

    - Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
    - Evaluate possibilities for a dedicated access to the station.
    - Evaluate switching to underground power supply.
    - Evaluate the significance of the corrosion on the Gorman Rupp pump.
    - Install new and/or up to date SPDs to protect the pumps and SCADA system.
    - Install proper indoor lighting.
    - Rehabilitate float terminal blocks to meet NEC codes.

5.2.5.5 LS-19 Port Charlotte High School

The Port Charlotte High School lift station (LS-19) is between the Port Charlotte High School and Port Charlotte Town Center, adjacent to the Veterinary Emergency Clinic at 17879 Murdock Circle. This submersible lift station, originally built in the 1980s, receives wastewater flow from the nearby mall, high school, and surrounding commercial. The station discharges through a 6-inch force main, which is conveyed to the East Port WRF.

LS-19 contains two 20-HP Flygt pumps model CP3152 with 454-mm impellers. Each pump has an estimated capacity of 908 gpm at 70 feet of head. These pumps are submerged in a 20-foot-7-inch deep and 8-foot diameter lined concrete wetwell. The wetwell contains four floats and is showing signs of corrosion. The valve vault is in fair condition and contains corroded ductile iron piping, 6-inch Dezurik plug valves, 6-inch Kennedy check valves, and dedicated discharge.

LS-19 receives 480-volt, three-phase power with a pole-mounted transformer. LS-19 does not include a fence and lock, dedicated site lighting, or an odor-control system. The hatches are in good condition but showing signs of corrosion and have a 2-inch cylindrical rail-retrieval system. The PVC vent appears to be held together by duct tape. The control panel does not have seal offs or SCADA present but does include a portable generator receptacle and mechanical interlock between the generator and main breaker. The station is equipped with an outdated SPD. While on site, an unfamiliar white waste was observed entering the wetwell from the invert to the northwest. The station is equipped with potable water service.

The following deficiencies were noted:

- Surficial corrosion to valve vault and fittings within the vault.
- Missing seal-offs from the control panel conduit.
- Wetwell vent is held together by duct tape.
- Outdated SPD.

Proposed improvements to the station include:

- Evaluate the significance of the corrosion of the piping and fittings within the valve vault.
- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Repair or replace the vent piping.
- Install new and/or up-to-date surge protection device (SPDs) to protect the pumps and SCADA system.

5.2.5.6 LS-24 Charlotte Square

The Charlotte Square lift station (LS-24) is northeast of Abbe's Donut Nook at 2150 Tamiami Trail north of the intersection of Forrest Nelson Boulevard and Tamiami Trail. The station receives residential and commercial flow from the surrounding area and discharges to the Quesada Lift Station (LS-37) to convey flow to the East Port WRF.

LS-24 contains two 3-HP ShinMaywa 4CNWX42.2T2E submersible pumps inside a lined concrete 6-foot-diameter, 14-foot-10-inch deep wetwell. Each pump has an estimated capacity of 100 gpm at 47 feet of head. The wetwell is heavily corroded, and the lining is separated from the wall in some places. A strong hydrogen sulfur odor is prevalent. Additionally, the surface of the liquid in the well shows some signs of grease. The station is equipped with a 2-inch cylindrical rail-retrieval system. The wetwell is an older design in which the valve vault is not separated by a wall and is instead a shelf built into the side of the wetwell (shown in photograph below). This design can be dangerous to operators who need access during high-water levels in addition to confined space issues and sulfide exposure. LS-24 can experience flash flooding. The heavily corroded 4-inch Dezurik plug valves and 4-inch Kennedy check valves are on this shelf.

The site is not fenced in and has a large buildup of debris and trash from surrounding businesses. Additionally, the site does not have dedicated site lighting or an odor-control system. The wetwell hatch is in good condition and padlocked for safety. The valve vault hatch is a detachable cover secured by four bolts and nuts, which hinders accessibility, as opposed to the traditional hinged hatch design with handle. The power service to the station is 208-volt, three-phase with a pad-mounted transformer just south of the wetwell. The station has a DFS Tac II SCADA system with a telemetry transmitter/receiver. The control panel does not have seal-offs but is equipped with a portable generator receptacle, and a mechanical interlock is between the generator and main braker. The station is equipped with potable water service.

The following deficiencies were noted:

- Heavy corrosion of the lined concrete wetwell and equipment.
- Flooding events during heavy rainfall in short periods (flash flooding).
- The valves are on an adjacent shelf at the top of the wetwell without dedicated discharge.
- Missing seal-offs from the control panel conduit.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Evaluate the wetwell for potential structural repair and restoration of wetwell lining.
- Evaluate sealing the wetwell and/or raising the wetwell elevation to avoid I/I.
- Evaluate the construction of a separate, isolated valve vault for operator safety, including standard dedicated discharge.
- Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
- Evaluate incorporating dedicated lift station lighting.

5.2.5.7 LS-25 Vo-Tech

Built in the 1980s, the Vo-Tech lift station (LS-25) was named after the nearby Charlotte Technical College, Charlotte County's first Vocational-Trade school. This LS is at the southeast corner of Murdock Circle and Education Way. The station receives flow from the technical school campus, adjacent institutional and medical facilities, and the Charlotte County Administration Center. The Vo-Tech LS conveys flow to the East Port WRF.

The Vo-Tech LS includes two 10-hp Flygt submersible pumps. Pump No. 1, installed in 2001, is a model NP3127.180 with 484-mm impeller. Pump No. 2, installed in approximately 2021, is a model NP3127.060 with a 489-mm impeller. Each pump has an estimated capacity of 238 gpm at 46 feet of head. The pumps are housed in a lined concrete 8-foot-diameter, 18-1/2-foot-deep wetwell. The overall condition of the wetwell was good, with early signs of corrosion and grease buildup. The wetwell hatch was observed as being in good condition and includes a 2-inch cylindrical rail-retrieval system. Each pump discharges through a 6-inch-diameter above-ground piping configuration, which includes a 6-inch Dezurik plug valve and a 6-inch AFC flapper-style check valve. Slight corrosion was noted on the exterior of the valve bodies. The AFC check valves were reported as functional by the operator; however, this equipment is

outdated, and only a few similar models exist at County LSs today, making availability of parts and maintenance experience limited.

The site is fenced with barbed wire but does not have dedicated site lighting but the operator noted the lighting is generally adequate due to the LS being near a traffic intersection. Adequate space appeared to be provided for maintenance activities. The station does not include an odor-control system. The power service to the station is 480-volt, three-phase with a pole-mounted transformer at the immediate corner of the local intersection. Backup power is provided permanently on-site via a fuel-tank-mounted diesel-powered Kohler generator. The generator is rated at 42-kW and 52.5-kVA, with a fuel tank capacity of 279 gallons. Grading settlement was observed at the generator platform and between the generator and discharge piping. The operator advised that the site was being evaluated by CCU for a potential sinkhole and advised the Jones Edmunds staff not to walk on or stand near the grade settlement. Subsequent observation of the wetwell indicated a gravity sewer line runs under the identified area, potentially damaged or crushed by the observed grade settlement. The control panel is equipped with seal-offs. The station includes a DFS Tac II SCADA system including a telemetry transmitter/receiver. However, no SPD is provided for the pump station or on-site SCADA system. A mechanical interlock is between the generator and main braker. The station is equipped with potable water service.

The following deficiencies were noted:

- Lined concrete wetwell is showing early signs of corrosion.
- Grade settlement observed near generator and between discharge piping and generator.
- Potentially crushed invert east of the wetwell.
- Missing ARVs on the discharge piping.
- Conduit and rebar protruding through the grade.
- Antiquated check valves.
- Missing SPD.

Proposed improvements to the station include:

- Evaluate the significance of the wetwell corrosion.
- Evaluate potential solutions to grade settlement to re-establish grade near the generator and between discharge piping and generator to original condition.
- Evaluate the invert east of the wetwell.
- Replace the removed ARVs on the discharge piping.
- Remove the conduit and rebar protruding through the grade.
- Replace the check valves with those specified in CCU standards.
- Install new and/or up-to-date SPDs to protect the pumps and SCADA system.

5.2.5.8 LS-44 Liberty Elementary

The Liberty Elementary lift station (LS-44) is in front of Liberty Elementary School at 370 Atwater Street, northeast of the intersection of Wilkie Avenue and Atwater Street. The station receives low-pressure sewer flow from the surrounding residential and gravity flow from the elementary school. LS 44 conveys flow through a 12-inch force main to a 20-inch force main on Peachland Boulevard and finally to the East Port WRF.

The lift station contains two 20-HP Flygt model CP 3152 submersible pumps with 454-mm impellers; one of the pumps is not seated correctly and is experiencing blowback. The pumps are submerged in a 6-foot-diameter, 10-foot-2-inch-deep wetwell. Each pump has an estimated capacity of 454 gpm at approximately 45 feet of head.

The wetwell is extremely corroded with cracks along the lining of the wall, and lining separation from the wall. The wetwell hatch is in good condition and provides adequate access to remove the pumps along the 2-inch cylindrical rail-retrieval system. The wetwell is vented but a strong odor was present at the time of the site visit. The adjacent lined valve vault includes 4-inch ductile iron discharge piping, Dezurik plug valves, and Mueller check valves with a dedicated discharge. Heavy corrosion is evident within the vault, particularly on the check valves. The hatch of the valve vault is in good condition.

The power service to the station is 230-volt, three-phase, with a pole-mounted transformer. The control panel has seal-offs although becoming corroded likely due to the high exposure to hydrogen sulfide and is equipped with a portable generator receptacle. The station did not appear to have a mechanical interlock. The station has a DFS Tac II SCADA system with a telemetry transmitter/receiver.

The site has barbed-wire fencing. The overall condition of the fencing is fair; the fence is showing signs of corrosion, some barbed wire disconnects occur, and a gap between the gravel and the bottom of the fence creates easy access for small animals. The only access to the lift station is across the sidewalk through the school entrance, which does not allow vehicular access. The station is equipped with potable water service. The station does not have dedicated site lighting.

The following deficiencies were noted:

- Wetwell has severe lining peeling and corrosion.
- Piping, check, and plug valves in the vault are heavily corroded.
- Being next to the school makes access difficult during peak school traffic.
- Fence is corroding at brackets and hinges, has barbed wire damage, and has gaps between grade and fence line.
- Blowbacks from the pump.
- Strong hydrogen sulfide odor from wetwell.
- Seal-offs are corroded.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Evaluate and perform full replacement of wetwell, valve vault, and associated appurtenances to meet CCU standards.
- Evaluate the significance of the corrosion on fittings within valve vault.
- Evaluate incorporating dedicated access for operations staff.
- Restore corroded fence materials and repair the fence damage. Re-establish the grade between the fence and gravel.
- Re-establish the pump to its original seating to prevent blowback.
- Evaluate the addition of an odor-control system.
- Replace the seal-offs on the control panel due to heavy corrosion and immense sulfide odor.
- Evaluate incorporating dedicated lift station lighting.

5.2.5.9 LS-45 Woodbury

The Woodbury lift station (LS-45) is across the street from Full Spectrum Retirement at 630 Woodbury Drive, south of the intersection of Paulson Drive and Woodbury Drive. This station, built in 1983, receives wastewater from the surrounding commercial properties along US 41. The station discharges through a 6-inch force main to Quesada (LS-37) where flow is conveyed to the East Port WRF.

LS-45 contains two 10-HP Flygt pumps. Pump No. 1 was replaced in 2023 and is a model NP 3127 submersible pump with 438-mm impeller, whereas Pump No. 2 is the model CP 3127 with a 432-mm impeller. The pumps are installed in a 6-foot-diameter, 18-foot-3-inch-deep, lined concrete wetwell. Each pump has an estimated capacity of 176 gpm at approximately 24 feet of head. The wetwell interior is in fair condition, showing signs of corrosion and early structural degradation and has a strong odor. The station is equipped with a 2-inch cylindrical rail-retrieval system. The station has a dedicated discharge in the valve vault that also houses a 6-inch AFC plug valve and 6-inch Mueller check valve, which is missing or has a damaged swing mechanism. The concrete valve vault is in good condition, but debris is beginning to accumulate on the bottom surface.

The site is completely fenced, showing minor signs of corrosion and damage. The site does not have dedicated lighting or an odor-control system. The power service at the station is 480 volts, three-phase, with a pole-mounted transformer across street from the station. The station has a DFS Tac II SCADA system with a telemetry transmitter/receiver. The control panel is equipped with a mechanical interlock and a portable generator receptacle that is no longer necessary due to the recently installed 42-kW, 52.5-kVA, 279-gallon, Kohler diesel generator. The existing concrete support for the control panel, power feed, and main disconnect is visibly cracking and contains a hollow portion. The station is equipped with potable water service.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- Strong hydrogen sulfide odor from wetwell.
- Broken invert between the LS and manhole to the immediate east (on Woodbury Drive). The operator reported repairs to the invert and/or manhole are pending through CCU.
- The fence and barbed wire are showing signs of corrosion and have some damage.
- Missing or damaged swing mechanism for the check valve.
- Wetwell is showing signs of corrosion.
- Outdated SPD.
- Missing dedicated site lighting.
- Support for control panel, power feed, and main disconnect is damaged.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to return to conformance with current electrical codes.
- Evaluate the addition an odor-control system.
- Evaluate and complete rehabilitation of the invert and/or manhole to immediate east to restore normal operating conditions.
- Replace corroded fence materials. Repair fence and barbed wire damage.
- Rehabilitate or replace check valve.
- Evaluate the significance of the wetwell corrosion.
- Install new and/or up-to-date surge protection device (SPDs) to protect the pumps and SCADA system.
- Evaluate incorporating dedicated lift station lighting.
- Evaluate the damaged electrical support for repair or replacement.

5.2.5.10 LS-809 Placida Harbour

The Placida Harbour lift station (LS-809) is at 11000 Placida Road inside the Placida Harbour residential community southeast of the intersection of Gaspar Drive and Placida Road. The station was originally built in 1986 by the Placida Harbour developer but ultimately relinquished to CCU. It receives wastewater from LS-810, LS-811, and the surrounding residential community and discharges through a 6-inch force main that is conveyed to the Rotonda WRF.

The station contains two 7.5-HP ShinMaywa model 4CNWX45.512E submersible pumps inside a 6-foot-diameter, 20-foot-8-inch deep concrete wetwell. Each pump has an estimated capacity of 254 gpm at approximately 44 feet of head. The wetwell, floats, pumps, discharge piping, valves, and electrical equipment were upgraded in the early 2020s and are now in excellent condition. The station is equipped with a 2-inch cylindrical rail-retrieval system. The valve vault is adjacent to the wetwell, containing two 6-inch Dezurik plug valves and two 6-inch Kennedy check valves. The valve vault is in fair condition with sediment and debris built up at the bottom.

The station does not have a secured perimeter fence but is behind a partial fence out of sight where the residential community's trash cans are stored, making access to the site difficult for operators. Gates prevent unauthorized access into the community. The station does not have dedicated site lighting or an odor-control system on site. The power service to the station is 230-volt, three-phase, with a pad-mounted transformer. The control panel is equipped with a portable generator receptacle and a mechanical interlock between the generator and main breaker but does not include seal-offs. The station has an Omni Beacon SCADA system with a telemetry cellular transmitter/receiver but no battery backup in case of emergency. No potable water service was observed on site.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit. This represents a significant code violation as well as a potential explosion hazard.
- Missing battery backup for the Omni Beacon telemetry.
- Poor lift station access.
- Missing potable water service near the station.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to return to conformance with current electrical codes.
- Install battery backups to provide redundancy for signaling to the Operations staff.
- Evaluate incorporating dedicated access for the operations staff, including access for pump trucks.
- Evaluate incorporating a water service connection near the station.
- Evaluate incorporating dedicated lift station lighting.

5.2.5.11 LS-812 Annapolis

The Annapolis lift station (LS-812), built in the 1970s and upgraded in 2006, is in the utility corridor across from 226 Annapolis Lane. This submersible lift station receives flow from the surrounding residential areas and conveys the wastewater to the Rotonda WRF.

Annapolis contains two 5-HP Flygt pumps model CP 3102.180 with 433-mm impellers. Each pump has an estimated capacity of 317 gpm at 30 feet of head (based on the County's drawdown reports). These pumps are submerged in a 17-foot-deep, 6-foot-

diameter concrete wetwell with a 2-inch cylindrical rail-retrieval system. The wetwell contains four floats and is showing signs of corrosion, leaks, cracks, and grease. The pumps discharge through a 4-inch force main to the above ground valve assembly. The assembly includes 4-inch Mueller plug valves, 4-inch Kennedy check valves, and a 4-inch dedicated discharge with a camlock connection.

The station receives 240-volt, three-phase power with a pad-mounted transformer. The control panel has a portable generator receptacle and mechanical interlock between the generator and main breaker, but does not have seal-offs, VFDs, or SCADA. The station does not have the standard fence with barbed wire but instead has a smaller chain surrounding the lift station. The station does not have dedicated lighting, an odor-control system, or dedicated access to the site without having to travel off-road. The operator noted the drainage mainly impacts the accessibility to the station, but the station itself operates fine due to the elevated pad and wetwell. No potable water service was observed on site.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit. This represents a significant code violation as well as a potential explosion hazard.
- Poor lift station access.
- Missing potable water service near the station.
- Missing SCADA system.
- Wetwell is cracking and leaking.
- Wetwell is showing signs of corrosion.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell to return to conformance with current electrical codes.
- Evaluate incorporating dedicated access for the Operations staff.
- Evaluate incorporating a water service connection near the station.
- Evaluate the addition of a SCADA system.
- Seal cracks and leaks in wetwell.
- Evaluate the significance of wetwell corrosion.
- Evaluate incorporating dedicated lift station lighting.

5.2.5.12 LS-813 Marina

The Marina lift station (LS-813) is at 115 Rotonda Circle across from the Rotonda Golf and Country Club, south of the intersection of Golfview Road and Rotonda Circle. This station, built in the 1970s, receives flows from LS 812, as well as the surrounding residential area, and discharges through a 4-inch force main and conveyed to the Rotonda WRF.

This station was significantly damaged during Hurricane Ian in September 2022; the pump housing building was uplifted and carried away, leaving the wetwell temporarily exposed. The County addressed the exposed open top of the wetwell by retrofitting a concrete flat top with a lockable vault hatch, as can be seen in the site photographs. The County is actively rehabilitating the station, inclusive of new electrical, security fencing, and installation of a permanent on-site generator. Temporary security fencing is provided on site and will remain until the rehabilitation project is complete.

The station contains two 3.75-HP ABS/Sulzer model XFP100C-CB1.5-PE28/4 submersible pumps with 6.7-inch impellers that were installed in May 2021 in a 6-foot-diameter, 18-foot-deep, concrete wetwell. The station is equipped with a 2-inch cylindrical rail-retrieval system. The pumps have an estimated capacity of 175 gpm at approximately 19 feet of head. A dedicated discharge is a few feet west of the station and is showing significant signs of corrosion. The 4-inch discharge piping contains a 4-inch Rockwell Nordstrom plug valve and 4-inch Onyx duckbill check valve. The station has 4-inch dedicated suction with a 4-inch Dezurik plug valve.

Hurricane Ian demolished the lighting, so the station has no dedicated site lighting. The station does not have an odor-control system. The power service to the station is 230 volts, three-phase and is powered by a pad-mounted transformer at the driveway entrance leading to the lift station. The station has a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver. The control panel does not have seal-offs but is equipped with a portable generator receptacle. The mechanical interlock is on the dead front of the panel, allowing the potential for it to be accidentally overridden. No potable water service was observed on site.

Due to the County's ongoing rehabilitation project for this station, deficiencies noted and proposed improvements have been refined to better suit the future status of the station. Please see previous years' Annual Reports for past deficiencies noted and recommended improvements that may or may not be applicable once LS rehabilitation is complete.

The following deficiencies were noted:

- Missing dedicated lighting.
- Significant corrosion to dedicated discharge bypass piping and associated plug valve. The plug valve was installed with blue paint, representative of potable water; the fitting paint should instead be green, representative of sewer force main.
- The wetwell is exposed near the discharge piping, posing a safety risk.

- Missing seal-offs from the control panel conduit.
- The lift station building was demolished, and a temporary fence was erected in place of it.
- Mechanical interlock was secured to the dead front instead of behind it, allowing the potential for it to be overridden.
- Missing potable water service near the station.

Proposed improvements to the station include:

- The County is actively undergoing a rehabilitation project which includes installation of a permanent on-site generator. The rehabilitation should provide the following in general to address the identified deficiencies:
    - Dedicated lighting.
    - Permanent security fencing to prevent unwanted access.
    - Electrical controls to meet CCU standards and electrical codes including outdoor-rated panel, phase monitors, SPD, and seal-offs.
    - SCADA integration.
    - Potable water service.
- Secure the mechanical interlock behind the dead front between the generator and the main breaker.
- Complete surface preparation to remove rust and excess paint and apply standard green paint to dedicated discharge main and plug valve.
- Repair wetwell gaps to eliminate access gaps and excess I/I to the LS. Incorporate drainage provisions as necessary to appropriately capture and divert surface runoff to avoid and prevent flooding.

5.2.5.13 LS-818 Harbor West

The Harbor West lift station (LS-818) is at 14613 Ponce De Leon Trail and receives gravity flows from the surrounding area. LS-818 discharges through a 4-inch DI force main and is conveyed to the West Port WRF.

The station, constructed in 2020, contains two 6.5-HP Flygt NP3102.070 submersible pumps with 256-mm impellers in an 8-foot-diameter, 26-foot-6-inch-deep concrete wetwell. The wetwell is showing slight signs of grease. Each pump has an estimated capacity of 84 gpm at approximately 106 feet of head. The wetwell hatches are in good condition and provide adequate access to remove the pumps along the 2-inch cylindrical rail-retrieval system. The wetwell lining is largely unaffected by hydrogen sulfide. The station is equipped with 4-inch Dezurik plug valves, 4-inch Kennedy check valves, and dedicated suction and discharge camlock connections. The above-ground assembly is showing early signs of paint wear.

The station is fenced and has site lighting but does not have an odor-control system; however, the wetwell is vented. The power service to the station is 480-volt, three-phase with a pad-mounted transformer. The main power panel is equipped with a portable generator receptacle. The control panel has a mechanical interlock between the main breaker and generator breaker and seal-offs. The station has a DFS TCU SCADA system with a telemetry transmitter/ receiver. The control panel has seal-offs. The station is equipped with potable service.

The following deficiency was noted:

- Paint chipping and slight corrosion on the discharge piping and appurtenances.

The proposed improvement to the station includes:

- Evaluate the need for painting the discharge piping appurtenances.

5.2.5.14 LS-819 Rotonda Circle #1

Rotonda Circle #1 lift station (LS-819) is a nearly 50-year-old station northwest of the intersection of Bunker Road and Rotonda Circle near the Rotonda Canal. LS-819 serves residences on Bunker Road, Bunker Lane, and Rotonda Circle and conveys flow to the Rotonda WRF. This lift station has no vehicular access.

The station contains two submersible pumps; one is a 3-HP Flygt model NP 3085 with a 462-mm impeller, and the other is a 2.68-HP Sulzer XPF100C with 8.35-inch impeller in a 6-foot-diameter, 18-foot-4-inch-deep concrete wetwell that pumps flow through a 6-inch force main that crosses the Rotonda canal. The wetwell interior has signs of cracks, leaks, and grease. The station is equipped with a T-shaped rail-retrieval system. The valve vault is not accessible without tools because it is secured by four bolts and nuts at each corner. The valve vault is in poor condition and has corrosion, leaks, sediment/debris, and cracks.

The station has no fence or security. The power service to the station is 240-volt, one-phase power with a pole-mounted transformer. The outdated electrical control panel is in fair to poor condition and is missing seal-offs, mechanical interlocks, and SCADA system. The pumps are operating on Motortronic VCM Series VFDs. The station is equipped with a generator receptacle but does not have a dedicated pump suction or discharge connection. This station has an antiquated alarm, and CCU relies on customers calling when the audible local alarm goes off. Reliable means to inform CCU of potential overflows or emergencies is critical, since the station's location on a slope next to a waterway would likely result in sanitary sewer overflow events discharging directly to the water.

The following deficiencies were noted:

- The wetwell is showing signs of I/I into the wetwell due to gaps between wetwell section rings and cracks in the interior wall; the liner is no longer visible.
- Corrosion of discharge piping and valves.
- Outdated valve vault cover with accessibility issues.
- Outdated control panel without seal-offs.
- Missing SCADA system.
- Missing site lighting and security.
- Missing potable water service.

Proposed improvements to the station include:

- Evaluate replacement of this station to meet current CCU standards and to relocate it away from the waterway. The County owns a nearby empty lot at 261 Bunker Road that should be evaluated. A replacement lift station should also provide the following to address current deficiencies:
    - CCU standard lift station design for new wetwell and new discharge piping and appurtenances.
    - Electrical controls and panel features to meet CCU standards and electrical codes including outdoor-rated panel, phase monitors, SPD, and seal-offs.
    - SCADA integration.
    - Permanent security fencing to prevent unwanted access and dedicated site lighting for accessibility and safety.
    - Potable water service.
- Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:
    - Seal and re-line the wetwell to reduce excess I/I and prevent degradation of interior wetwell.
    - Evaluate the significance of corrosion to the discharge valves.
    - Install an on-site communications system and integrate the existing LS to SCADA.

5.2.5.15 LS-821 Rebel Court

The Rebel Court lift station (LS-821) constructed in the 1970s, is southeast of the intersection of Rebel Court and Bonita Drive and receives flow from the surrounding residential area. The Rebel Court station discharges through a 6-inch force main to LS-816 then LS-801 and finally to the Rotonda WRF.

The vented concrete wetwell is in fair condition and showing early signs of corrosion and leaking. The station contains two 10-HP Flygt pumps model 3127.060 with

421-mm impellers. The wetwell is 10-foot diameter, 23-foot-3-inch-deep, with erosion occurring at grade around the exterior of the wetwell. The wetwell hatch is showing signs of corrosion. The station is equipped with a T-shaped rail-retrieval system. The valve vault is in fair condition but is beginning to corrode around the rim, and significant debris and insects was observed in the vault. The 6-inch Kennedy check valve and 6-inch Mueller plug valve are becoming heavily corroded. A dedicated discharge is on site but is buried, showing signs of corrosion and not easily accessible in case of an emergency.

The Rebel Court LS receives 230-volt, three-phase power with a pole-mounted transformer. In case of emergency, a 31-kW, 38.8-kVA, 221-gallon diesel fuel tank, Kohler generator is present. The operator noted that the generator was not in operation at the time of the visit. The control panel is equipped with a portable generator receptacle, mechanical interlock, and outdated SPD but does not include seal-offs. The station has a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver unit with backup battery.

The generator is the only part of the lift station that is fenced with barbed wire. The operator noted that the drainage at the station is not good due to being in the ditch. Overhead powerlines and a limited easement adjacent to neighboring property at this station can make accessibility challenging. The station is equipped with potable water service but does not include dedicated site lighting.

The following deficiencies were noted:

- Missing seal-offs from the control panel conduit.
- Erosion around wetwell lid.
- Signs of I/I into the wetwell due to gaps between wetwell section rings. The wetwell is showing signs of degradation due to lack of liner.
- Corrosion of valves in valve vault.
- Corrosion of wetwell hatch.
- Corrosion of discharge bypass camlock connection.
- Outdated SPD.
- Missing dedicated site lighting.

Proposed improvements to the station include:

- Install seal-offs on any electrical equipment within 10 feet of the wetwell and perform a detailed electrical code review to return to conformance with current electrical codes.
- Re-establish grade around the wetwell lid.
- Evaluate the significance of the degradation of wetwell and relining of wetwell.
- Evaluate the significance of corrosion on the valves in valve vault.
- Evaluate the integrity of the wetwell hatch.
- Rehabilitate or replace camlock connection.

- Install new and/or up-to-date SPDs to protect the pumps and SCADA system.
- Evaluate incorporating dedicated lift station lighting.

5.3 VACUUM STATIONS

At the end of FY 2023, the system had four vacuum stations owned by CCU. The four existing stations have permanent auxiliary power and on-site trailer-mounted generators capable of providing full power for 3 to 5 days.

During site visit assessments conducted by Jones Edmunds personnel and CCU staff on January 31, 2024, through February 2, 2024, three vacuum stations were evaluated, as selected by CCU staff. In addition to the standard assessments, an electrical condition assessment was conducted at the El Jobean vacuum station, VS-3. In total, all four vacuum stations were visited as shown in Table 5-2. The site visit assessments will help CCU to identify and prioritize maintenance, rehabilitation, or replacement work at these lift stations.

Table 5-2 Visited Wastewater Collection Systems – Vacuum Stations

Station No.	Location
VS-1 – Skylark	598 Skylark Lane NW
VS-2 – Harbor	3450 Harbor Boulevard
VS-3 – El Jobean (Elec. Only)	4070 Railroad Avenue
VS-4 - Ackerman	18330 Ackerman Avenue

5.3.1 VS 1 – SKYLARK

The Skylark Vacuum Station (VS-1) is at 598 Skylark Lane NW, southwest of the intersection of Azalea Avenue NW and Skylark Lane NW. This vacuum lift station receives flow from the vacuum collection system in the surrounding area through two 10-inch and two 8-inch vacuum lines. VS-1 discharges through a 6-inch that manifolds into an 8-inch force main header that conveys flow to the East Port WRF.

The station contains two 50-HP Cornell centrifugal Model 4514T-VC18DB pumps inside the building. Each pump has a design capacity of 725 gpm at 137.4 feet of head, but the pump impellers were modified to operate at approximately 34 feet of head to accommodate other improvements to the Mid County wastewater transmission system. The Cornell pumps discharge through a 6-inch force main where 6-inch GA plug and check valves are located. The flow manifolds to an 8-inch force main and passes through an 8-inch GA plug and check valve. The station appears to be without a discharge flow meter. The plastic covers for both pump motor components are missing or broken and need to be replaced. The 6-inch discharge plug and check valves, Cornell pumps, and pump skids are showing early signs of corrosion.

A 5,000-gallon Augusta fiberglass vacuum tank in the lower level of the building has a design pressure of 5 psi. Access to the lower level is by a stairwell. The tank appears to be missing a dedicated access point, making it difficult for maintenance. CCU added a hazard sign near the stairwell to prevent entry by unauthorized personnel. Six 15-HP Busch Mink Model MM 1502 A VA6 vacuum pumps, each rated for 353 actual cubic feet per minute (ACFM) of displacement, force flow into the vacuum tank. A permanent overhead crane exists for removing these vacuum pumps.

The building contains a dedicated pump crane for removing the discharge pumps and valves from the lower level. The crane appears aligned with the pumps but does not appear aligned with the valves. The discharge isolation valves are overhead in the lower level and only accessible by the dedicated overhead crane in the building. Additionally, CCU maintains a portable hoist system for use at any vacuum station.

The station is gated and surrounded by a block wall. The roof and ceiling are being repaired from wind damage from Hurricane Ian. The station has outdoor and indoor site lighting, but the operators noted that the lighting on site is dim and the lighting at Ackerman, VS-4 is an example of optimal lighting for their needs. The operators noted that equipment is frequently cleaned but poor drainage in the vacuum tank pit results in additional labor. Skylark is equipped with a mulch bed odor-control system using bark media. The operators noted the odor-control system is running too long and burning hot due to no vacuum pump VFDs. Due to this, the well casing PVC has melted, and a strong odor is coming from the mulch bed. The top part of the mulch bed liner that is exposed is separating from concrete. The three 4-inch Dezurik plug valves for surface pump-out connection and connected to camlock connections are showing signs of corrosion. The power service to the station is 480-volt, three-phase with a pole-mounted transformer. A 300-kW Cummins generator, rated at 375-kVA, with an ATS and a 519-gallon fuel tank, is installed within the fence on the west end of the site. The generator is operated once a week each Monday morning to verify standby power capabilities. The station has a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver unit. The station is equipped with indoor and outdoor potable water service.

The following deficiencies were noted:

- The crane pump on site is not aligned with the valves. Some of the valves are below the common discharge line and meter, making them difficult to access with the crane.
- The access for tank maintenance is at the top of the tank without a dedicated access point.
- Plastic covers for the effluent pump motor components are missing or broken.
- Mulch bed deficiencies include:
  - Strong odor from the mulch bed.
  - Overall color of mulch appeared faded, suggesting mulch is near end of useful life.
  - Well casing PVC is melted.
  - Open exposure of odor piping in the mulch bed allowing odor to dissipate directly into open atmosphere.
  - 4-inch Dezurik check valves are corroding.
- Poor interior lighting due to repairs from Hurricane Ian.
- Poor drainage in the vacuum tank pit.
- Missing discharge flow meter.

Additionally, the Jones Edmunds electrical engineer visited on February 21, 2023, to meet with staff and observe the station. The electrical engineer noted the following:

- The Cummings 352 KW Generator Set was rebuilt after being damaged by a lightning strike 4 months ago.
- The generator set remote display is almost impossible to read because of its location and provides little to no clearance.
- Staff noted significant voltage issues at this station causing problems with controls and VFDs; Florida Power & Light and CCU will monitor and verify.
- The sump pump motor flex conduit has insufficient support.
- The conduit strut stand is missing anchor bolts.

Proposed improvements to the station include:

- Evaluate modifying the overhead crane for lateral movement.
- Evaluate adding a catwalk for accessing the top of the tank for maintenance.
- Evaluate replacing the check valve with CCU standard check valves.
- Replace the plastic covers for the pump motor components.
- Evaluate a full rehabilitation of the mulch bed odor-control to mitigate deficiencies listed above.
- Evaluate lighting improvements for operators like the lighting at Ackerman, VS-4.
- Evaluate solutions to address poor drainage to achieve better drainage, such as at Harbor, VS-2.
- Evaluate installation of a discharge flow meter.

5.3.2 VS 2 – HARBOR

The Harbor Vacuum Station (VS-2) is at 3450 Harbor Boulevard. This vacuum lift station receives flow from two 8-inch vacuum lines, with a third 8-inch influent line for future use. VS-2 collects flow from approximately 200 homes in the surrounding area. VS-2 discharges through two 6-inch force mains that transmit flows through a 6-inch Siemens flow meter to the Southport Master Lift Station (LS-65), which flows directly to the East Port WRF.

The station contains two 25-HP Cornell centrifugal Model 4514T-VC18D8 pumps with 10-inch impellers inside the building. Each pump has an estimated capacity of 411 gpm at approximately 92 feet of head.

A 5,000-gallon Duratech Vacuum Tank in the lower level of the building has a design pressure of 5 psi. A feasible way to access the equipment on top of the tank to maintain and clean the equipment was not apparent. Access to the lower level is by a stairwell. CCU added a hazard sign near the stairwell to prevent entry by unauthorized personnel. Three 15-HP Busch Mink Model MM 1502 AV vacuum pumps force flows into the vacuum tank; room is available for a fourth pump for future flows. The operators noted that the pumps skids continually rust and routine painting is needed to maintain the appearance. The operators also pointed out that the seals of the moisture separators on the vacuum pumps are beginning to corrode.

The building contains a dedicated pump crane for removal of pumps and valves from the lower level; however, the crane is not aligned with the pumps or the valves. The discharge isolation valves are overhead and difficult to remove with the dedicated overhead crane in the building.

The station is gated and surrounded by a 4-foot block wall. The roof and ceiling are being repaired from wind damage from Hurricane Ian. The station has outdoor and indoor site lighting, but the operators noted that the lighting on-site is dim and that the lighting at Ackerman, VS-4 is an example of optimal lighting for their needs. The station is equipped with a mulch bed odor-control system using pine bark media. The station is equipped with indoor and outdoor potable water service. The power service to the station is 480-volt, three-phase with a pole-mounted transformer. A 175-kW Cummins generator, rated at 218.7 kVA, with an ATS and a 500-gallon fuel tank, is installed within the fence on the north end of the site. The generator is operated once a week each Monday to verify standby power

capabilities. The station has a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver unit. The operators noted that they have had issues with unauthorized personnel at this station site, thus security/lighting upgrades are being considered to address the issue.

The following deficiencies were noted:

- The pump crane on site is not aligned with the pump or the valves. Some of the valves are below the common discharge line and meter, making them difficult to access with the crane.
- The tank maintenance access is at the top of the tank without a dedicated access point.
- The pump skid continuously rusts.
- The moisture separator seals are beginning to corrode.
- Poor interior lighting due to repairs from Hurricane Ian.
- Reported issues of unauthorized personnel being near the site.

Proposed improvements to the station include:

- Evaluate modifying the overhead crane for lateral movement.
- Evaluate adding a catwalk for accessing the top of the tank for maintenance.
- Evaluate long-term solutions to pump skid rusting.
- Evaluate replacing corroded seals on moisture separators.
- Evaluate lighting improvements for operators like those at Ackerman VS-4.
- Evaluate security improvements for better monitoring (i.e., cameras, etc.).

5.3.3 VS 3 – El Jobean (Electrical Only)

This section will only include details specific to the electrical condition assessment of the El Jobean Vacuum Station (VS-3) conducted as part of the 2023 Annual Report. A standard Annual Report condition assessment of the El Jobean VS-3 was completed in the 2022 CCU Annual Report, including the non-electrical components, deficiencies identified, and improvement recommendations; see 2022 Annual Report for details. Overall, four facilities were selected by CCU staff for the 2023 Annual Report for electrical-specific condition assessment by Jones Edmunds electrical engineering staff; the selected facilities included:

- Rotonda WRF.
- South Port Master Lift Station (LS-65).
- El Jobean Vacuum Station (VS-3).
- Golf Course WBS.

The electrical engineer conducted the above site visits on Wednesday, February 28, 2024. No major issues were identified or reported by CCU operations staff during the site visit.

The following deficiency was noted:

- The breaker feeding the generator had a tripped heater. The reason was unknown.

Proposed improvements to the station include:

- Evaluate the tripped heaters.

5.3.4 VS 4 – ACKERMAN

The Ackerman Vacuum Station (VS-4), completed construction in 2023, is at 18330 Ackerman Avenue. This vacuum station receives flow through six 10-inch vacuum lines equipped with six 10-inch Mueller plug valves. VS-4 discharges through an 8-inch force main header and conveyed to the East Port WRF.

The vacuum tank is pumped down through two 20-HP Cornell Pumps, model 4514T-VC18DB, with a design point of 661 gpm at 59 feet of head and is discharged through 6-inch Mueller check and plug valves, which manifold to an 8-inch header with an 8-inch check and plug valve, Siemens flow meter, and a pressure transducer. The newly constructed vacuum station is equipped with six 15-HP Busch Mink Model MM 1502 AVA6 with a rated capacity of 353 ACFM that force the flow into the 6,000-gallon Duratech vacuum tank with a design pressure of 5 psi. Ackerman is equipped with a crane system to assist in pulling equipment from the pump skid.

The overall appearance of the station is excellent. The station is enclosed by an approximate 6-foot block wall and a rolling gate. The station is equipped with a mulch bed odor-control system, indoor and outdoor potable water service, and dedicated indoor and outdoor site lighting. The operators noted that equipment is frequently cleaned but poor drainage in the vacuum tank pit results in additional labor. This station has a catwalk to make accessing the vacuum tank for maintenance more efficient. Access to the lower level is by a stairwell. CCU added a hazard sign near the stairwell to prevent entry by unauthorized personnel. The power service to the station is 480-volt, three-phase power with a pad-mounted transformer. In case of emergencies, Ackerman can operate on the 352-kW, 440-kVA, 1,500-gallon, diesel tank mounted Cummins generator. The generator is operated every Monday to ensure standby power is fully operational. The station is equipped with Allen Bradley PowerFlex 525 VFDs and a DFS Tac II TCU SCADA system with a telemetry transmitter/receiver unit.

The following deficiency was noted:

- Poor drainage in the vacuum tank pit.

Proposed improvements to the station include:

- Evaluate trench drainage implementation like Harbor, VS-2.

5.4 OPERATIONS

The operation of the wastewater collection system requires the ability to move all service area-generated wastewater to its tributary treatment plant. The wastewater quantity is in constant flux, and CCU Operations staff is tasked with understanding and managing the daily, monthly, and seasonal lows and peaks. The flat terrain of Charlotte County requires more than 300 pumping stations to transfer wastewater from the customer connections to the treatment plants.

CCU maintains a separate department for operating and maintaining the collection systems. Although many of the pumping stations (lift and vacuum stations) are continuously monitored by RTUs, each station is visited a minimum of monthly in accordance with FDEP requirements. Most of the daily sewer department effort is involved with maintaining the pumping stations through daily or weekly physical inspections and a proactive maintenance program.

Unforeseen pump station failures require immediate attention. CCU maintains two 6,000-gallon tankers and three 4,000-gallon tankers and has contracts with local septage haulers. These tankers serve a dual purpose. They are used to transport sludge from the wastewater treatment plants but are also available to haul raw wastewater from lift station sites and to supplement vacuum station performance during emergencies. As discussed in Section 5.2, many pump stations include on-site standby power or portable generator receptacles that can be used during power failures and bypass pump connections in the event of a pump failure. With an ongoing effort through FEMA grants and CIP projects, CCU continues to increase the number of stations with dedicated auxiliary power options, as well as acquire additional spare generators for emergency use at any station.

5.5 MAINTENANCE

Maintenance procedures for the wastewater collection system are like those followed for the water distribution systems.

5.5.1 WORK ORDERS

The process for generating and completing WOs in the Wastewater Collection workgroup is similar to as described for the Water Distribution workgroup. WOs are generated on a daily basis for repair- and maintenance-related items. Service calls from customers also result in generated WOs prioritized based on criticality. Each WO provides a means for CCU staff to be dispatched for evaluation and/or repair of reported issues. WOs from service calls may require preventative or corrective actions. Table 5-3 summarizes WO actions by CCU for the wastewater collection system during FY 2023. The information includes corrective and preventative maintenance resulting from WOs.

Table 5-3 Completed Work Orders – FY 2022

System/Issue	Total Corrective WOs	Corrective WOs from Service Calls	Preventative Maintenance WOs	Total WOs
Low-Pressure Sewer	4,228	4,228	116	5,134
Sewer Lines	448	112	46	645
Lift Stations	925	231	461	3,364
Vacuum Sewer	748	187	104	1,788

5.5.2 DATA MANAGEMENT

The EAMS described in Chapter 4 is in full implementation. As its database continues to expand, it will also be shared even more than it is currently. For example, a manager will be able to query the system to determine if open work orders exist in a specific neighborhood, regardless of whether they are water or wastewater related, or if the Public Works Department is planning to pave a street before a planned open-cut repair of a wastewater collection line.

During the planning stages of a new collection system, CCU engages an engineering consultant to perform a feasibility study that includes an economic comparison of installing a conventional or modified gravity system, with its network of lift stations and force mains, versus a low-pressure and/or a vacuum system. The major components of the comparison are initial construction costs and future maintenance costs over the life of the system. Future costs are brought to present-day costs, much like an annuity, and added to construction costs to determine total project cost. The final selection of the new collection system is based on these life-cycle costs and the specific needs of each area served.

The EAMS will allow this type of economic analysis to be performed with greater precision in future studies, because costs will be more accurately known.

5.5.3 MAINTENANCE

The wetwells of all lift stations and vacuum stations are inspected regularly. Problems are addressed as they are found. This effort extends beyond the thorough inspection of representative stations, as described in Section 5.2.

Most of the CCU collection and transmission systems were acquired in the 1990s from other utilities where some of the infrastructure dates back to the 1950s. Older sewers were typically installed in swales, which made them more prone to I/I. Also, design and construction standards were not as stringent as the current practices when much of the system was installed. Pipe material and joints were constructed with material that deteriorates with time. The older gravity sewer pipes are vitrified clay with frequent joints that are sources of I/I. Vitrified clay pipe is resistant to corrosion but is more brittle than PVC and HDPE pipe. After many years of service, cracks develop, and pieces of the clay pipe protrude into the flow stream. Although CCU has relatively few plugged sewers, the broken clay pipe will cause blockage and must be repaired.

CCU Wastewater Collections staff performs in-place pipe repairs to fix most of the broken pipes in the system. Most repairs involve a cast-in-place lining, fold-and-form lining, or PVC lining. These repair methods restore the integrity of the sewer system without requiring excavation.

The gravity sewer system provides considerable storage time during power failures to allow CCU staff time to address the issue. CCU has developed an emergency preparedness program for the systems in the service area. If a power failure occurs in the LPS system, approximately 20 minutes of wastewater storage remains in the LPS system lift station wetwells. This allows CCU to dispatch appropriate tanker truck and/or generator support, as discussed earlier in this chapter.

5.6 Review of Previous Report Recommendations

Table 5-4 summarizes the recommendations and status since the 2022 Annual Report for the wastewater collection system.

Table 5-4 Wastewater Collection System – FY 2022 Recommendations and Status

Recommendation:	Continue the scheduled repair of sanitary lift stations that have deteriorated due to age and hydrogen sulfide presence.
Progress:	Ongoing.
Recommendation:	Continue to use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Progress:	Ongoing.
Recommendation:	Continue construction and plan for the next phases of sewer expansion in the Port Charlotte area in accordance with 2017 Sewer Master Plan.
Progress:	Ongoing.
Recommendation:	Continue to televise and smoke test gravity sewers to locate source(s) of I/I. Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Progress:	Ongoing.
Recommendation:	Install odor-control systems at lift stations where hydrogen sulfide concentrations cause odors and deteriorate structures.
Progress:	Ongoing.
Recommendation:	Complete construction of the Ackerman Vacuum Station.
Progress:	Completed.
	Master Lift Station No. 801 – Field
Recommendation:	Evaluate replacing the electromagnetic flow transmitter for the force main.
Progress:	Ongoing.
	Master Lift Station No. 882 – Oldsmar
Recommendations:	1. Evaluate replacing the skid for the odor-control unit. 2. Evaluate removing the fallen trees from the site. 3. Replace the barbed wire and fence around the site. 4. Paint the check valve for the lead pump discharge. 5. Remove the broken antenna from the site.
Progress:	1. Unit was evaluated and determined to be effective. Replacement will be conditionally assessed at a later date. 2. Completed. 3. Ongoing. Timeline for completion contingent on bid package award. 4. Completed. 5. Ongoing. Timeline for completion contingent on bid package award.

	Lift Station No. 404 – Big Pine
Recommendations:	1. Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection. 2. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 3. Replace the valve vault hatch and associated lock. 4. Remove the fallen tree from lift station site.
Progress:	1. Ongoing. 2. Not completed. 3. Lock was replaced. 4. Completed.
Recommendations:	Lift Station No. 407 – Vincent 1. Evaluate seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 2. Replace the valve vault hatch and associated lock. 3. Replace the generator receptacle. 4. Remove sediment from valve vault drain opening.
Progress:	1. Ongoing. 2. Lock was replaced. 3. Completed. 4. Ongoing.
	Lift Station No. 408 – Cabana
Recommendations:	1. Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and the dedicated discharge connection. 2. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 3. Replace the generator receptacle. 4. Replace the wetwell hatch. 5. Replace the valve vault hatch and associated lock. 6. Remove sediment from valve vault drain opening.
Progress:	1. Ongoing. 2. Ongoing. Not completed. 4. Not completed. 5. Lock was replaced. 6. Ongoing.
	Lift Station No.409 – Santa Inez
Recommendations:	1. Evaluate replacing the submersible pump discharge piping, plug valves, check valves, and dedicated discharge connection. 2. Evaluate replacing the valve vault hatch and associated lock. 3. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 4. Replace the wetwell hatch. 5. Remove sediment from valve vault drain opening.
Progress:	1. Plug valves, check valves, and camlock adapter for dedicated discharge connection replaced. 2. Completed. 3. Not completed. 4. Evaluated to remain. 5. Ongoing.

	Lift Station No. 410 – Monza
Recommendation:	1. Evaluate replacing the submersible pump discharge piping, plug valves, and check valves, and dedicated discharge connection. 2. Evaluate replacing the valve vault hatch and associated lock. 3. Replace the wetwell hatch.
Progress:	1. Ongoing. 2. Lock was replaced. 3. Not completed.
	Lift Station No. 411 – San Ciprian
Recommendations:	1. Evaluate replacing the submersible pump discharge piping, plug valves, and check valves. 2. Evaluate replacing the valve vault hatch and associated lock. 3. Replace the wetwell hatch. 4. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. 5. Replace the portable generator receptacle.
Progress:	1. Discharge piping in wetwell and valve vault replaced with HDPE/ductile fittings; plug and check valves replaced. 2. Lock was replaced. 3. Not completed. 4. Not completed. 5. Ongoing.
	Lift Station No. 802 – Ball Park
Recommendation:	1. Perform thorough rehabilitation including some form of structural improvement and lining repair. 2. Evaluate replacing the submersible pump discharge piping. 3. Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
Progress:	1. Wetwell relining pending bid package award. 2. Discharge piping replacement pending bid package award. 3. Not completed.
	Lift Station No. 804 – Gas Station
Recommendation:	1. Perform thorough rehabilitation including some form of structural improvement and lining repair. 2. Evaluate replacing the antenna mast.
Progress:	1. Pending as a future improvement. 2. Ongoing. Timeline for completion contingent on bid package award.
	Lift Station No. 807 – Post Office
Recommendations:	1. Perform thorough rehabilitation including some form of structural improvement and lining repair. 2. Evaluate replacing the submersible pump discharge piping, plug valves, and check valves.
Progress:	1. Pending as a future improvement. 2. Pending as a future improvement.

	Lift Station No. 808 – Publix
Recommendation:	1. Perform thorough rehabilitation including some form of structural improvement and lining repair 2. Evaluate replacing the submersible pump discharge piping. 3. Replace the valve vault hatch and associated lock. 4. Remove sediment from valve vault drain opening.
Progress:	1. Currently being evaluated. 2. Ongoing. 3. Lock was replaced. 4. Ongoing.
	Vacuum Station No. 1 – Skylark
Recommendations:	1. Evaluate modifying the overhead crane with a trolley for lateral movement. 2. Evaluate a catwalk or dedicated ladder for accessing the top of the tank for maintenance. 3. Evaluate replacing the check valve. 4. Replace the plastic covers for the pump motor component. 5. Add a fire extinguisher to the inside of the building.
Progress:	1. Ongoing. 2. Ongoing. 3. Ongoing. 4. Not completed. 5. Completed.
	Vacuum Station No. 2 - Harbor
Recommendations:	1. Evaluate stairs or similar access to the generator to return to conformance with the National Electric Code. 2. Evaluate a catwalk or ladder for accessing the top of the tank for maintenance. 3. Evaluate a dedicated overhead crane for safer and easier access of the vacuum pumps. 4. Verify that the vacuum station site is in accordance with OSHA and County safety and confined-space requirements.
Progress:	1. Ongoing. 2. Ongoing. 3. Ongoing. 4. Completed.

6 WASTEWATER TREATMENT FACILITIES

CCU owns and operates four WRFs throughout Charlotte County and one leachate treatment facility (LTF) for the County landfill as shown in Figure 6-1. The East Port WRF serves Mid County, the West Port and Rotonda WRFs serve the West County service area, and the Burnt Store WRF serves the South County service area. This Chapter presents each facility independently since each WRF is unique in its design and treatment approach. In addition, this Chapter reviews CCU's wastewater pre-treatment and biosolids handling and disposal programs. Table 6-1 lists permitted treatment capacities of CCU's WRFs.

Figure 6-1 CCU Wastewater Treatment Facilities

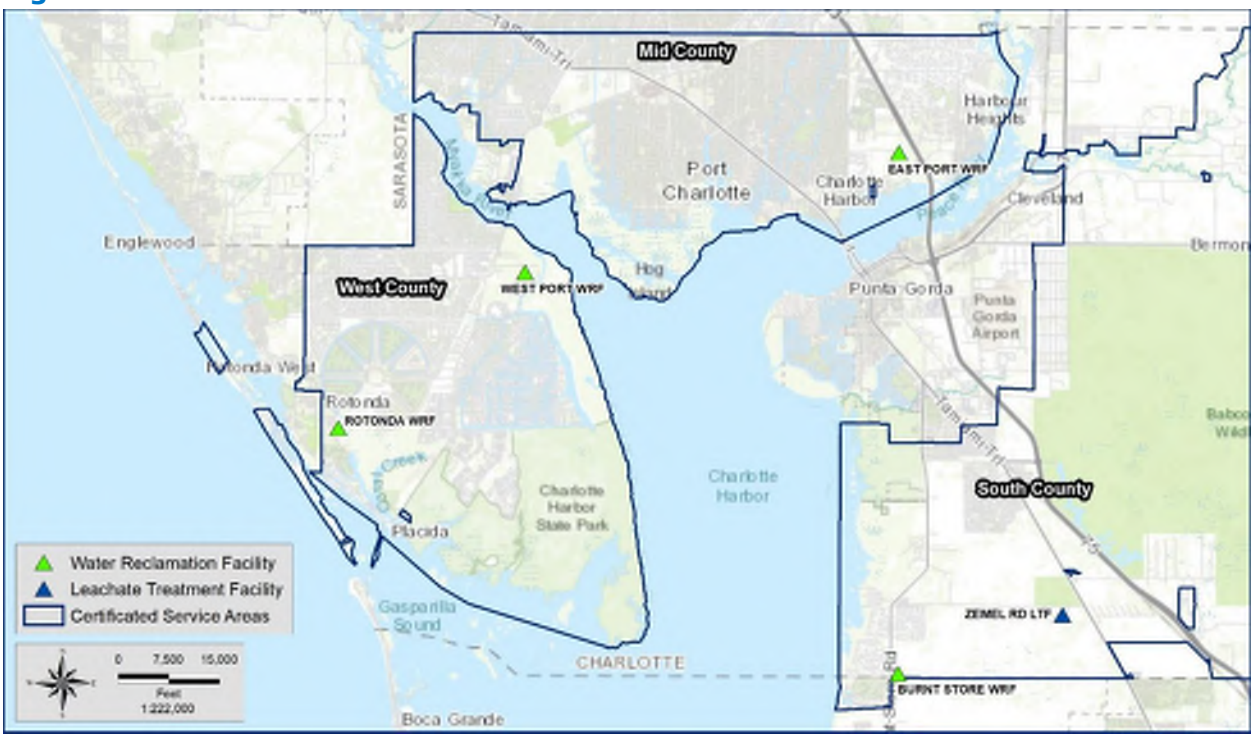


Table 6-1 CCU Water Reclamation Facilities and Design Capacities

WRFs	Current Permitted Capacity (MGD AADF)
East Port	6.0[a]
West Port	1.2[b]
Rotonda	2.0[c]
Burnt Store	0.5[d]
Total	**9.7**

Notes:

[a] Construction for plant expansion to 9.0 MGD AADF expected to be complete by Fall 2026.

[b] Design for expansion to 5.0 MGD AADF is currently underway and expected to be completed in December 2025.

[c] Design for AWT improvements and re-rate to 2.5 MGD AADF is underway; construction schedule to be determined.

[d] Construction for plant expansion to 2.5 MGD AADF expected to be complete by 2027.

6.1 WASTEWATER PRETREATMENT COMPLIANCE

CCU has a wastewater pretreatment program for receiving and collecting septage and FOG within the collection system to serve their residents with septic systems, enhance treatment, and prevent overflows in the collection system. CCU's Pretreatment Program includes:

- Transported Waste Receiving Program.
- Restaurant Grease Interceptor Inspection Program.
- Investigation of unauthorized discharges to the wastewater system.

6.1.1 TRANSPORTED WASTE RECEIVING PROGRAM

CCU is proud of the Waste Receiving Program, which provides an environmentally safe disposal option for septic waste, reducing land application and environmental impacts. Located at the East Port WRF, the septage receiving station (SRS) combines the hauled waste with plant influent to achieve reclaimed water-quality effluent and beneficial reuse of biosolids. Once on site, septage haulers enter a code to activate the SRS and then another code to identify their hauled septage as either In-County or Out-of-County septage for billing purposes.

In FY 2019, the SRS hours of operation were changed to 7:00 a.m. to 4:30 p.m., Monday through Friday, which allowed CCU staff to better monitor operations. This approach prolongs the life of the equipment by ensuring compliance with disposal requirements and eliminating mixed loads that damage equipment. In FY 2023, the program accepted 927,892 gallons from 38 permitted haulers.

6.1.2 RESTAURANT GREASE INTERCEPTOR INSPECTION PROGRAM

CCU does not accept FOG deliveries to any of their wastewater treatment facilities. This program is designed to help prevent sanitary sewer overflows in the CCU sanitary sewer collection system by removing FOG at the source. Program staff perform spot inspections and monitor grease interceptors at more than 400 restaurants and other food-preparation facilities County-wide to maintain compliance with the required pump-out schedule (e.g., 30, 60, or 90 days) and other required maintenance. The focus has been on older buildings and facilities that might have inadequate grease interceptors. Plans for new restaurants and other food preparation facilities are reviewed by CCU's Engineering Services Division for adherence to County specifications. This coordination with the Building Department has made the program more efficient. In FY 2023, 1,936 WOs were completed, including 1,596 grease trap inspections, 41 grease trap re-inspections, 20 spill sample inspections, and three new installation inspections.

Through a partnership with Liquid Environmental Solutions (LES), the FOG is transformed into biodiesel and other beneficial byproducts. LES receives restaurant grease directly from haulers and partially processes it for recycle use at a facility on the East Port WRF site. FOG is not treated through the East Port WRF process.

6.1.3 INVESTIGATION OF UNAUTHORIZED DISCHARGES

Investigation and prevention of unauthorized discharges are important for protecting the treatment capabilities of the WRFs and the environment. These unauthorized discharges are pollutants that enter the municipal waste stream and have an adverse effect on the treatment

process. Fortunately, no significant or categorical users are in the CCU collection system, eliminating the need for a full Industrial Pretreatment Program. When plant Operations staff report issues pertaining to the treatment process at any WRF, Pretreatment staff begin investigating by sampling upstream lift stations and manholes, reviewing activities from local connections, and working closely with lift station crews and plant personnel. The goal is to determine the source of the illegal discharge, take steps to eliminate the problem up to and including fines, and return the plant to normal operations.

6.2 East Port WRF

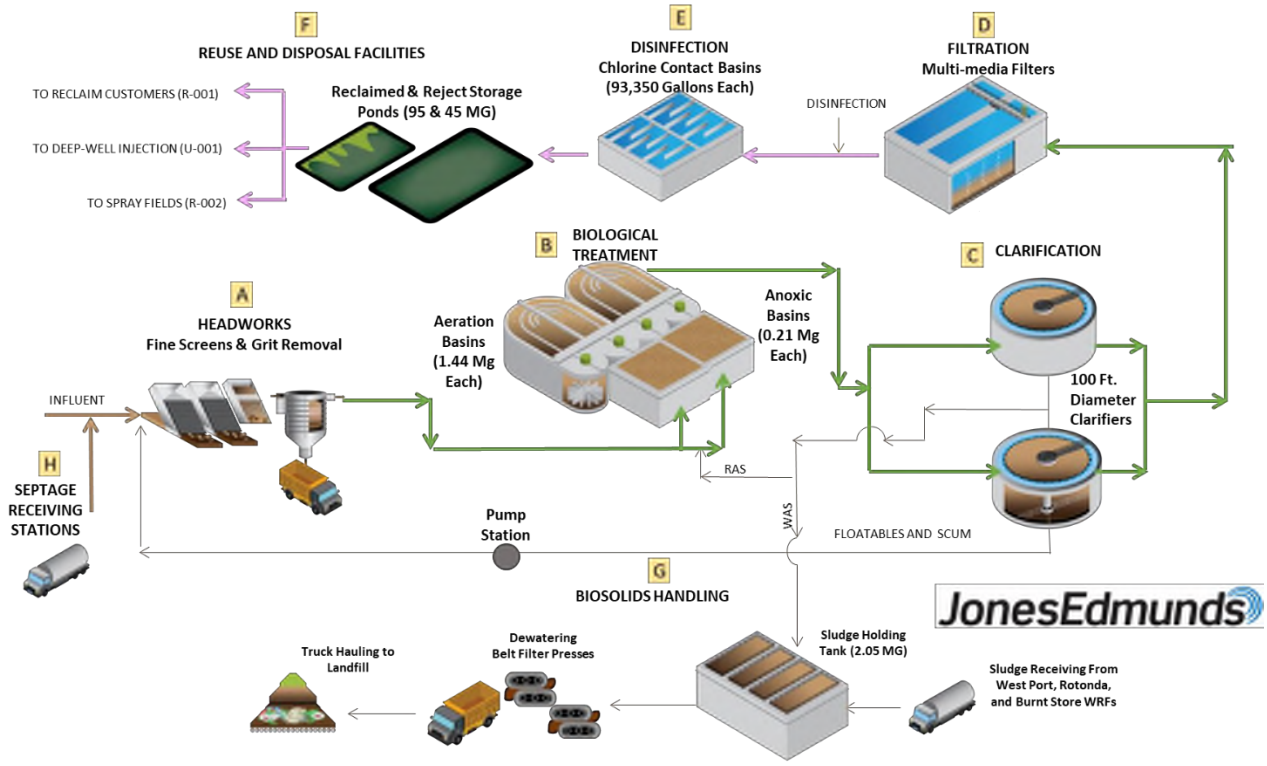
The East Port WRF is at 3100 Loveland Boulevard, Port Charlotte, Florida, and was acquired as part of the 1991 GDU purchase. The WRF began its current operations in 1996 with a current permitted operating capacity of 6.0 MGD AADF. East Port WRF uses a two-stage activated-sludge process to treat domestic wastewater collected from the Mid-County service area. Emergency power is provided by two diesel emergency generators in an on-site building with an ATS to maintain operation of critical facilities in the case of electrical power failure.

The East Port WRF is also the location of a National Environmental Laboratory Accreditation Program (NELAP)-certified East Port Laboratory (EPLAB) at the main operations building. The WRF site includes 51 acres of conservation easement, with the remaining area consisting primarily of woodlands. The site is home to more than 20 varieties of birds, including great egrets, osprey, and Carolina wrens. Many other wildlife species including gopher tortoises, scrub jays, bobcats, armadillos, cottontails, and alligators make the East Port WRF their home.

The East Port WRF is permitted to distribute 10.23-MGD AADF of reclaimed-quality water to the MRS (R-001) for unrestricted-public-access reuse, inject 9.60-MGD AADF into a deep well injection system (U-001), and apply 1.45-MGD AADF to a slow-rate restricted-access land application system (R-002). The WRF is classified as a Type I, Category II, Class A domestic wastewater treatment facility under FAC 62-699 and is required to meet Class III Reliability standards in accordance with Chapters 62-600 and 62-610, FAC. The restricted irrigation system consists of 187 acres on site using slow-rate irrigation (R-002 Spray Fields). About 45 acres of the spray fields were abandoned in 2018 for use by the Charlotte County Sheriff Department.

Figure 6-2 shows the East Port WRF process flow diagram. The key components of the East Port process are described in the following sections.

Figure 6-2 East Port WRF Process Flow Diagram



A) Headworks: Raw wastewater enters the WRF headworks structure where mechanical screening and grit removal take place. After screening, wastewater flows into one of the two vortex-type grit-removal units for grit separation. Compacted screening and separated grit are dewatered and discharged to dumpsters for disposal. Internal plant flows from the In-Plant Pump Station No. 1 are introduced back to the headworks, including septage, biosolids dewatering system filtrate, tank and unit process drain flows, and supernatant decant from the aerobic digesters.

B) Biological Treatment: Wastewater from the headworks splits between two treatment trains configured in a 2-Stage Anoxic/Aerobic, Modified Ludzack-Ettinger (MLE) Process. Each train includes an anoxic basin and oxidation ditch (aeration basin) for organics and Total-Nitrogen removal. Mixers keep solids suspended and homogenous in the anoxic zones. Mechanical surface agitators keep the oxidation ditches aerated and maintain a channel velocity to keep mixed liquor in suspension. Internal recycle (IR) pumps send mixed liquor rich in Nitrate-Nitrogen from the oxidation ditch (aeration basin) to the anoxic basins to enhance Total-Nitrogen removal.

C) Clarification: Flow from the biological treatment process splits between two clarifiers. The clarifiers provide a quiescent environment to promote solids separation. The clarifiers are skimmed to remove floating materials and scum, which are sent to the aerobic digester for treatment. The clarifier effluent flows over a circumferential weir into a final effluent launder trough. Weir washers travel along the scum skimmer to remove algae from the weirs and trough. Settled solids from the secondary clarifiers are pumped to the front of the anoxic basins as return-activated sludge (RAS) to replenish the microbial community and to the aerobic digesters as waste-activated sludge (WAS).

D) Filtration: Clarified water splits between two multi-media (sand and anthracite) traveling bridge filters to remove remaining Total Suspended Solids (TSS) to a level at or below 5 mg/L TSS to meet requirements for high-level disinfection. A metal canopy over the filters was designed for use with an ultraviolet (UV) shade cloth to inhibit algae growth within the filter and provide equipment protection from sun exposure. Filter backwash is sent to In-Plant Pump Station No. 2, which pumps backwash water to the headworks structure.

E) Disinfection: Filtered water splits between two chlorine contact chambers (CCCs) where liquid sodium hypochlorite is dosed for disinfection. CCC No. 1 is designated for reclaimed water production that meets high-level disinfection requirements. CCC No. 2 is designated for disposal to restricted-access sites (e.g., Class I deep injection wells or spray fields) that meet basic-level disinfection requirements. Sodium hypochlorite is stored in one storage tank with a capacity of 6,000 gallons. Non-reagent analyzers are used to adjust chlorine feed rates and for chlorine residual compliance measurement.

F) Reuse and Disposal Facilities: Transfer pumps (Nos. 1, 2, and 3) in the clearwell of CCC No. 2 pump reclaimed water to the 95-MG reclaimed water Storage Pond. HSPS No. 1 is in the CCC No. 1 clearwell and pumps reclaimed water to the plant-water system 8-inch force main loop. The clearwells of CCC No. 1 and No. 2 are connected by a 4-foot-wide slide gate that is normally open. The gate is currently inoperable and held in the open position. The 95-MGD reclaimed water pond is connected to the 9-MGD HSPS No. 2 via a 30-inch suction line. This pump station pumps directly to the 36-inch distribution line that feeds the Mid and West County public access reclaimed water system. The WRF's public-access reuse system is operated in accordance with the WRF's Monitoring and Operating Protocol for the Reclaimed Water System (latest version).

   Water not meeting reclaimed water standards is rejected to the 45-MG reject pond by opening and closing automated valves. From the 45-MG pond, reject water can be sent to the slow-rate restricted-access reclaimed water spray fields or the two Class I injection wells (IW-1 and IW-2) with permitted capacities of 1,420 gpm (2.045 MGD) and 5,250 gpm (7.560 MGD), respectively.

G) Biosolids Handling: WAS is pumped from the clarifiers to the 2.0-MG sludge holding tank where blowers provide aeration to aerobically digest the sludge before dewatering using two Ashbrook 2-Meter belt filter presses (BFPs). The East Port WRF digester is permitted to accept waste sludge from the West Port, Rotonda, and Burnt Store WRFs. The County owns two 6,000-gallon tanker trucks that make daily hauls from the other three WRFs and off-load into the East Port WRF digester. Operations staff decant the digested sludge several times a week, and the supernatant is pumped backed to the headworks. The sludge transfer pumps at the digester are operated by control panels at each BFP to pump thickened WAS to the dewatering units. Sludge is dewatered to 17-percent TS and is hauled to the Charlotte County Zemel Road Class I Municipal Landfill for disposal at the Synagro Biosolids and Yard Waste Co-Compost Facility.

H) Septage Receiving Stations (SRS): The WRF has two Lakeside Raptor SRSs for domestic septage tank haulers to off-load septage. The septage haulers are provided

unique access codes for off-loading and invoice generation. Septage haulers enter their access code in the receiving station control panel, the valve opens to allow off-load, and the flow meter records the septage volume for billing each hauler. The system allows for fast off-loading, minimal operations oversight, and administrative features to collect and record hauler data for invoicing. The septage is screened and directly pumped to the WRF headworks.

6.2.1 Regulatory Considerations

The East Port WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Plant Operating Permit (FL0040291-029-DW1P) – Expiration Date: November 30, 2027.
    - Authorization for expansion to 9.0 MGD including upgrades to meet AWT standards. Authorization to discharge reclaimed water to West Port Community Development District stormwater management system (D-004).
    - Notice of Minor Revision (FL0040291-031-DWF) to increase frequency of analysis of monitoring for 5-day Carbonaceous Biochemical Oxygen Demand (BOD), TSS, Total Nitrogen (TN), and Total Phosphorus (T)P parameters.
    - The 2017 Plant Operating Permit renewal was divided into expansion stages to address the needed improvements while allowing the schedule of the expansion to be determined by CCU based on projected service area growth.
    - Stage 1 and 2 Improvements were completed in FY 2016 and addressed upgrading the electrical, I&C, and SCADA systems for future expansion. Process treatment components upgrades included the headworks screens and grit pumps, biological treatment process – dissolved oxygen (DO) control system, effluent filter rebuilds, and addition of the 2.0-MG sludge holding tank and related biosolids improvements.
    - Stage 5 Improvements were prioritized ahead of Stages 3 and 4 to enhance reclaimed water storage in the 95-MG pond and increase the transmission capacity to 9 MGD to provide more reclaimed water to Mid and West County. Stage 5 design work was bid in Spring 2017, construction was completed in FY 2019, and operation training was provided in March 2020.
    - Stage 3 and 4 Improvements included a 9.0-MGD expansion and adding new facilities such as a new SRS, AWT facility, and dewatering facility. The 9.0-MGD expansion is designed to accommodate a future expansion to 12.0 MGD. The 9.0-MGD expansion includes an oxidation ditch splitter box sized for 12.0 MGD, an equalization (EQ) tank and a transfer pump station, a third oxidation ditch, an AWT diversion structure and AWT structure sized for 12.0 MGD, third and fourth clarifiers, new scum pump stations, third and fourth effluent filters and CCCs, an effluent transfer pump station, a chemical storage and feed system, a fourth digester, a dewatering facility with two screw presses and room for a third, SRSs, and associated electrical, I&C, and SCADA improvements. For the future 12.0-MGD expansion, the improvements include a 12.0-MGD headworks, fourth oxidization ditch, fifth effluent filter, fifth CCC, additional chemical storage, additional dewatering unit in the dewatering facility, and associated electrical, I&C, and SCADA improvements. The Stage 3 and 4 Improvements were bid in fall 2023, and construction is expected to be complete by fall 2026.

- IW-1 Permit (0330486-004-UO/1M) – Expiration Date: October 17, 2027.
  - The previous MIT was performed on IW-1 on September 5, 2019. The next MIT will be due by September 4, 2024.
- IW-2 Permit (0330486-003-UO/1M) – Expiration Date: May 4, 2026
  - The previous MIT was performed on IW-2 on July 2, 2020. The next MIT will be due by July 1, 2025.

6.2.2 Wastewater Flows and Loads

The East Port WRF permitted capacity is 6.0-MGD AADF. In FY 2023, the highest AADF was 5.08 MGD, and the East Port WRF was operating at 85 percent of the plant permit capacity. The highest maximum daily flow (MDF) occurred in August 2023 at 12.41 MGD. The highest TMADF of 5.73 MGD occurred in September 2023, which is 96 percent of the plant permitted capacity. The plant permit capacity is based on AADF, so the facility remains in compliance with the plant permitted capacity of 6.0 MGD. Although the plant is operating at 85 percent of the rated capacity of 6.0 MGD AADF, the ongoing efforts and completed plant improvement design described above are prepared to increase the design capacity of the East Port WRF to 9.0 MGD. Table 6-2 summarizes the influent flows as reported in the Discharge Monitoring Reports (DMRs).

Table 6-2 East Port WRF Influent Flows FY 2023

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-22	5.29	4.88	5.65	6.42	94
Nov-22	5.75	4.95	5.69	7.41	95
Dec-22	4.87	5.00	5.30	7.80	88
Jan-23	4.62	5.02	5.08	4.85	85
Feb-23	4.69	5.03	4.59	4.73	77
Mar-23	4.59	5.05	4.60	5.15	77
Apr-23	4.44	5.07	4.54	4.85	76
May-23	4.29	5.08	4.44	5.24	74
Jun-23	4.62	4.98	4.45	5.41	74
Jul-23	4.93	4.97	4.61	7.21	77
Aug-23	6.47	5.04	5.34	12.41	89
Sep-23	5.79	5.02	5.73	6.73	96

Notes: MDF = Maximum daily flow.

[1] Permitted plant capacity of 6.0 MGD; measured at monitoring site CAL-10.

At the end of FY 2023, the average annual influent load for BOD was 6,263 pounds per day (lb/day) and for TSS was 6,801 lb/day. The maximum monthly average BOD load was 8,644 lb/day in February 2023. The maximum monthly average TSS load was 8,175 lb/day, also in February 2023. Table 6-3 summarizes the wastewater characteristics of the East Port WRF influent as reported in the DMRs.

Table 6-3 East Port WRF Influent Water Quality FY 2023

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-22	105	4,632	111	4,897
Nov-22	136	6,522	130	6,234
Dec-22	184	7,473	162	6,580
Jan-23	205	7,899	191	7,359
Feb-23	221	8,644	209	8,175
Mar-23	217	8,307	201	7,694
Apr-23	172	6,369	190	7,036
May-23	169	6,047	193	6,905
Jun-23	136	5,240	162	6,242
Jul-23	108	4,441	157	6,455
Aug-23	89	4,802	134	7,231
Sep-23	99	4,781	141	6,809

Note: [1] Measured at monitoring site INF-01.

6.2.3 Treatment Objectives and Effluent Quality

The East Port WRF is designed to treat wastewater to three effluent standards: one for disposal to the deep injection wells (U-001 and U-002), one for public-access reuse (R-001) levels requiring high-level disinfection, and one for the on-site spray fields (R-002) requiring basic level disinfection. Table 6-4 lists the flows and primary water quality requirements for each effluent reuse and disposal method. Currently, the WRF has 100-percent backup to the reuse system with disposal to U-001.

Table 6-4 East Port WRF Effluent Requirements

Reuse/Disposal Method	R-001	R-002	U-001
Max Flow (MGD)	10.233[a]	1.45[a]	9.6[a]
Max BOD (mg/L)[1]	20[a] /30[b]/45[c]/60[d]	20[a]/30[b]/40[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Max TSS (mg/L)[1]	5[d]	20[a]/30[b]/45[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Total Fecal (#/mL)	25[d]	200[a] /200[e]/800[d]	Not applicable
Total Nitrogen[1]	Report [d]	N/A	N/A
Total Phosphorus[1]	Report [d]	N/A	N/A

Notes:

[1] Frequency of analysis increased from 5 days per week to 7 days per week, effective immediately, per Notice of Permit Revision dated February 28, 2023.

Statistical Bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample; [e]monthly geometric mean.

Table 6-5 summarizes the effluent flow and water quality of the East Port WRF. The East Port WRF is producing a high-quality reclaimed water and operating within the permitted flow

limits. In FY 2023, the annual average effluent flow for to the MRS (R-001) and sprayfields (R-002) were 2.5 MGD and 0.0 MGD AADF, respectively. Wells IW-1 and IW-2 (U-001) totaled 2.97 MGD AADF, which is below the permitted capacity of 9.6 MGD AADF. The maximum single sample BOD and TSS values were 2.0 mg/L and 1.4 mg/L, respectively, showing no violations of the single-sample limits for BOD or TSS were recorded in FY 2023. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2023. The maximum fecal coliform counts rarely exceeded 1 per 100 milliliters (1/100mL) except for two events in November 2022 and March 2023.

Table 6-5 East Port WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method				Water Quality		
	R-001 Monthly Avg. Flow (MGD)[1]	R-002 Monthly Avg. Flow (MGD)[2]	IW-1 Monthly Avg. Flow (MGD)[3]	IW-2 Monthly Avg. Flow (MGD)[4]	Maximum BOD Conc. (mg/L)[5]	Maximum TSS Conc. (mg/L)[6]	Maximum Fecal Count (#/100mL)[5]
Oct-22	0.6	0	0.4	4.3	2.0	1.0	<1
Nov-22	0.8	0	0.4	4.6	2.0	0.5	2.0
Dec-22	1.2	0	0.4	4.0	2.0	0.4	<1
Jan-23	1.5	0	0.3	2.9	2.0	0.6	<1
Feb-23	1.6	0	0.3	3.0	2.0	1.4	1.0
Mar-23	2.5	0	0.2	1.8	2.0	0.4	4.1
Apr-23	2.2	0	0.2	1.6	2.0	1.0	1.0
May-23	2.3	0	0	0	2.0	1.1	1.0
Jun-23	2.5	0	0.04	0.4	2.0	0.7	<1
Jul-23	2.3	0	0.2	1.7	2.0	1.4	<1
Aug-23	2.2	0	0.3	3.9	2.0	1.0	<1
Sep-23	1.2	0	0.4	4.4	2.0	0.9	1.0

Note: [1]Monitoring site FLW-02; [2]Monitoring site FLW-04; [3]Monitoring site FLW-03; [4] Monitoring site FLW-05; [5]Monitoring sites EFA-01 and EFA-02; [6]Monitoring sites EFA-02 and EFB-01.

6.2.4 Treatment Components and Condition Assessments

Jones Edmunds completed an on-site review of the plant on January 31, 2024; the information gathered at that time was used to update this section, in accordance with the project scope. Jones Edmunds personnel met with the Lead Operator, Robert (Bruno) Black, to review plant conditions and operations; records were collected and reviewed as part of Annual Report efforts. Access to the facility is through a secure gate in a fence that surrounds the wastewater plant and the on-site irrigation and deep injection well areas. The WRF site, stormwater pond, and sprayfield sites are routinely mowed and cleared and are well maintained.

The Operations Building includes the office of the Treatment Facilities Division Manager, the EPLAB, Backflow and Reclaimed Water Coordinator, conference room, administrative space, operations room, break room, and offices for Operations staff and other related staff.

General observations noted during the site visit include:

- All valves appear to be regularly exercised.
- Process piping is painted and clearly marked.
- All compliance meters are being calibrated every 6 months, and calibration tags are up to date.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operator's licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium).
- Reports required to complete the last permit application (in process).
- Certification of the EPLAB.
- Sampling plan.
- Groundwater monitoring plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF.

6.2.4.1 WRF Influent Sampling Location

The East Port WRF monitored influent water quality and flow for permit compliance. The influent water quality sampling location (INF-01) and flow monitoring (FLW-01) locations at the East Port WRF are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition. The flow meter was calibrated in December 2023.

6.2.4.2 Headworks

The overall condition of the headworks is fair, but the screens are rusted and in poor condition. The rake/teeth used to clear the screens of captured debris have deteriorated among other components. The grit classifiers show signs of high corrosion and rust. The aluminum grating at the influent channel is missing and needs to be replaced. The screening and grit bagging

system that was attached to the chutes that discharge into the dumpsters has significantly reduced the water on the floor, flies, and odors that usually accompany headworks' dumpster areas. The floor is clean and dry. At the top of the headworks, the hose bibb was disconnected and no longer in use. The CCU WRF staff have installed a number of bird deterrents in the lower level on pipe and ledges but a few areas remain where birds still land and create waste on the floor. CCU is working to replace the headwork screens, but an overall replacement with an upgraded headworks is recommended in the next 2 to 3 years.

The two SRSs require constant maintenance due to the high number of septage haulers that use the facilities and the nature of the waste. The SRSs are reaching the end of their useful life and are included in the 9.0-MGD WRF upgrade that is under construction.

The SRSs and the adjacent driveway area collect grit and spillage of septic waste. A hose is used by the haulers to clean the area. The washwater is collected in the plant gravity sewer system and pumped to the headworks for treatment by an onsite lift station. CCU WRF staff use a steam cleaner to clean this area periodically.

6.2.4.3 Flow Equalization

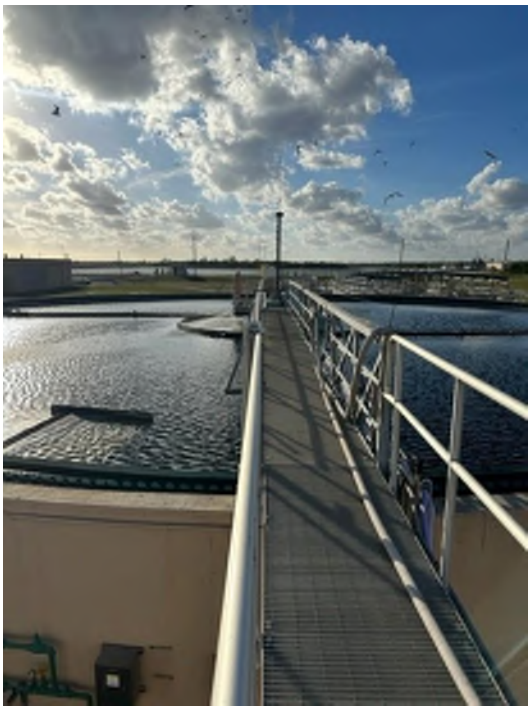
The East Port WRF does not have flow EQ storage for peak-hour influent flows and loads. However, the 1.48-MG cast-in-place concrete tank that previously served as the aerobic digester is being modified and retrofitted to serve as an influent EQ tank as part of the 9.0-MGD plant expansion that is under construction.

6.2.4.4 Biological Treatment

The overall condition and operation of the MLE process are good following the Stage 1 and 2 Improvements in 2016. Four VFD-controlled surface aerators are in operation in the oxidation ditches. The aerator speed is adjusted based on the DO probe at the end of the ditches. The aerators were recently taken down to remove rags and were serviced. Each oxidation ditch has two aerators; one of which runs at a constant set point of 80 percent speed, while the other is running variable speed controlled by VFDs. The DO-control system helps the WRF lower its power consumption and improve the denitrification process by minimizing DO carry-over to the anoxic zone. Six VFD-controlled IR pumps were replaced in the Stage 1 and 2 Improvements. These pumps are controlled by the SCADA based on operators' settings. The IR pumps are well maintained and in good working order. At the time of the site visit on January 31, 2024,

Oxidation Ditch No. 2 anoxic zone was observed to have areas where a significant amount of floatable solids were gathered and forming an island on the water surface. The CCU WRF staff noted that Mixer No. 2 in the anoxic basin will be replaced in the near future. Smaller areas of floatable solids were also observed at Oxidation Ditch No. 1. If this issue persists, we recommend spraying plant water to coax a better mixing zone and prevent floatable solids from collecting.

6.2.4.5 Clarification



In 2016, the two clarifiers were rehabilitated as part of the Stage 1 and 2 upgrades, which included replacing the clarifier scraper mechanisms. The overall condition of the sedimentation process is well maintained and clean, and the clarifiers are producing a high-quality effluent. The light pole on the walkway between the two clarifiers was blown off at the base by Hurricane Ian and needs to be replaced. The five RAS pumps are VFD-controlled. The operator noted that RAS Pump No. 4 was replaced in FY 2023, and the motor for RAS Pump No. 3 was replaced in FY 2023. The two WAS pumps are controlled by operators' settings in the SCADA system. Both pumping systems are well maintained and in good working order.

The existing scum ejectors were recently replaced with new ejectors in FY 2023; however, they will eventually be replaced with a cost-effective scum-pumping system as part of the 9.0-MGD plant expansion that is under construction.

A "weir washer" system was installed on Clarifier No. 1 and Clarifier No. 2 in 2017 and 2018, respectively. The weir washers eliminate the need to have O&M staff enter the clarifier effluent launders to remove algae, eliminating associated safety concerns. The weir washers do an excellent job of keeping the clarifier effluent weirs and troughs clean. An excellent-quality effluent is being produced by both clarifiers.

6.2.4.6 Filtration

The overall condition of the effluent filtration system is good with a few damages from Hurricane Ian. The emergency alarm does not work, and its associated conduit and support structure is damaged. The filters were rehabilitated as part of the Stage 1 and 2 Improvements. At the time of the site visit, Filter No. 1 was out of service due to a failed gearbox on the trolley, and new media and rails were being installed.

Filter No. 2 was also down for general rehabilitation work. The plant was executing rejecting mode 2 from the operation protocol, bypassing the filters, and sending clarified effluent through CCC No. 2 to the reject pond while the filters are being serviced and rehabilitated. A galvanized metal frame was installed over the filters in the Stage 1 and 2 Improvements to support a fabric roof constructed of UV shade cloth. However, the cloth was missing at the time of the site visit. The cloth will be replaced with roof panels bolted to the galvanized frame as part of the 9.0-MGD plant expansion that is under construction.

6.2.4.7 Disinfection and Effluent Sampling

The CCCs are in good condition, well maintained, and operated to produce reclaimed water for unrestricted public-access reuse. At the time of the site visit, CCC No. 1 was offline and CCC No. 2 was in service and sending water to reject since the filters were under bypass as noted in Section 6.2.4.6. Liquid sodium hypochlorite (12.5 percent) is stored in a 6,000-gallon dual-containment tank and used for disinfection to maintain a residual of ≥1.0 mg/L to meet unrestricted public-access reuse standards. In 2018, the old liquid reagent chlorine residual analyzer was replaced with a non-reagent analyzer to control chlorine feed rates. Another non-reagent analyzer is used for chlorine residual compliance measurement. The skid-mounted chlorine feed system is encased in a clear plastic enclosure to control the spray of liquid chlorine for safety purposes. The overall chemical feed systems and instrumentation are well maintained to meet regulatory permit requirements. The effluent flow and monitoring locations (EFA-01 and EFA-02) are clearly marked, and the refrigerated effluent composite samplers are in good operating condition.

6.2.4.8 Reuse, Disposal, and Storage

Reuse Facilities

Effluent that meets reclaimed water standards from the East Port WRF is conveyed to CCU's MRS (discussed in Chapter 7) using the reclaimed water HSPSs. The East Port WRF has two reclaimed water HSPSs. The reclaimed water HSPS No. 1 has three VFD-controlled 100-HP vertical turbine pumps that pump reclaimed water from the clearwell adjacent to CCC No. 1 into the WRF plant water system. The reclaimed water service pumps are well maintained and operated. The VFD controls allow the pumps to operate at high speeds to meet distribution system demand and at low speeds to provide non-potable water on site for operation and maintenance purposes.

The reclaimed water HSPS No. 2 has five VFD-controlled pumps, can pump 9.0 MGD at 108 psi, and was completed in 2019 as part of the Stage 5 Improvements. Due to heavy winds by Hurricane Ian, paint on the pumps and their associated piping was lost. The system includes four 120-micron self-cleaning filters manufactured by ORIVAL and was submitted as a value-engineering substitution. The units are currently bypassed due to fouling issues. The bypass around these filters is not impacting reclaimed water quality to end users.

The East Port WRF also contains a 95-MG lined storage pond that provides reclaimed water and wet-weather storage. In FY 2016/2017 the 95-MG pond was drained and cleaned, and the pond liner repaired. In 2019, a new automatically cleaned intake screen feeding HSPS No. 2 was installed in the pond as part of the Stage 5 Improvements. The berm, liner, and geotextile material in this storage pond were repaired in FY 2023 after damages from Hurricane Ian.

Reject Storage and Alternate Disposal

Excess reclaimed water or effluent not meeting reclaimed water standards (reject water) is disposed of through two deep injection wells and a restricted-access, on-site slow-rate irrigation system (on-site spray field). Effluent transfer pumps are well maintained but are showing signs that they need to be repainted. CCU also maintains a 45-MG lined effluent storage pond that is used before injection well and/or spray field disposal. It also serves as additional wet weather storage. The pond liner is in good condition.

The irrigation pump station is on the east bank of the 45-MG pond and pumps water from the pond to the deep injection wells or the spray field. Both deep injection wells are well maintained and in good working order. All valves are exercised regularly. All associated meters are calibrated semi-annually and are up to date.

Wet-Weather Storage

The on-site 95-MG reclaimed water pond and 45-MG reject storage pond are available for wet-weather storage of reclaimed water.

6.2.4.9 Biosolids Handling Facilities

The overall conditions of the biosolids storage/digestion tanks, associated piping, truck off-loading facilities, decant supernatant pumping, and BFP feed pumps at the new biosolids handling and storage tanks constructed under the Stage 1 and 2 Improvements are good. The facilities receive waste biosolids from the East Port WRF and the three other CCU WRFs and are well maintained and operated. CCU has two tankers used for hauling liquid sludge from the other WRFs and off-loading into the aerobic sludge-holding tanks before dewatering.

At the time of the site visit, Blower No. 4 was being reinstalled after being off site for a rebuild. Aerobic Digester Tank No. 2 was taken offline and cleaned in FY 2023. Digester No. 3 has

some areas that have partially plugged diffusers based on observations of the aeration and mixing during the visit; the digestor should also be taken offline and cleaned in the next year.

The Lead Operator noted in 2020 that the capacity of the aerobic digesters and the BFP to handle biosolids from all four facilities is starting to become an issue where sufficient time to allow tank decanting is limited due to the increased sludge flows. In addition, when a BFP is down for service, insufficient digester capacity is available to allow decanting. This issue is being resolved as part of the 9.0-MGD expansion, which is under construction, with the addition of another digester and a new dewatering facility with two screw presses that can operate longer.

6.2.4.10 Electrical Components and Circuitry

The East Port WRF contains one 1,250-kW generator serving the primary WRF as standby power. An additional 1,500-kW generator was installed as part of the Stage 5 Reclaimed Water Improvements. One standby generator serving the Administration Building was relocated from another facility in used condition. The facility has five primary electrical switchgear locations – the Administration building, the Generator/MCC building, the new primary incoming switchgear building, the new electrical building #2, and the blower building. The Administration building has a separate service drop from the power company. The rest of the WRF is served through two new parallel transformers serving the incoming switchgear building recently constructed. The Administration building, incoming switchgear building, and Electrical Building #2 were all constructed within the last 8 years. The Generator/MCC building had upgrades and improvements to existing original equipment and generators. The Blower Building has been in service for several years.

The incoming service and distribution transformers at the Administration building are relatively new and in excellent condition with no obvious signs of concern. The standby generator functions properly and is in good condition. Since it was relocated from another location, it does show signs of wear and deterioration but with no major issues to interfere with its function. The distribution switchgear of the Administration building was in excellent condition with minor issues (see below). Overall, the electrical equipment is in good functioning condition based on information from Operations staff.

The incoming switchgear building was constructed only a few years ago. As such, all equipment is in excellent condition. The facility is fed from two power company transformers, also newly installed. A thermographic survey of the facility showed no anomalies or issues.

The Generator/MCC building is an existing building with older equipment and new equipment installed under Stage 5 and Stage 1 and 2 Improvements. The existing switchgear appears to be in good condition. The switchgear includes complete arc-flash labeling required by NFPA 70E. The existing 1,250-kW generator is in overall good condition.

The distribution switchgear was in excellent condition with minor issues. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff.

The following briefly lists minor electrical issues at other locations throughout the plant. None of these constitute a significant issue but are documented here for reference and for future action:

- Headworks – Several conduits and their supports to the handrails and elsewhere were broken or damaged and need to be replaced or repaired.
- Oxidation Ditches Controller Panels – The screens on the controllers for the probes at the effluent of the oxidation ditches are showing some signs of sun damage, and we recommend that sunshields be installed over the front of the three-sided enclosures.
- Storage Building – A portion of the wall siding and a downspout are bent from hurricane winds.
- Blower Building – Most of the equipment is new and in service as part of the GMLS. There is a loss of roof drip edge at the top of the building.
- Electrical Building# 1 –The VFDs within this building are extraordinarily loud and hearing protection is required. The appropriate signs and warnings need to be provided.
- Electrical Building# 2 – Panel LE Section 2 Circuit #63 should be investigated for possible fault.
- Power Pole – This is leaning over along Old Landfill Road because of hurricane winds.
- Generator Building #1 – Two fans on the roof of the building are missing shrouds.
- Generator Building #2 – The ceiling is damaged on the inside of the building due to seepage of water from the internal roof drains. The air terminals are hanging loose on the side of the building.
- Construction Trailer – The concrete foundation is damaged, and the plumbing for the trailer needs to be repaired.
- Clarifier No. 1 – This shows unsupported conduit that needs to be properly supported per code. It is out of service with the center drive motor missing.
- Chlorine Contact Tanks – The chlorine pumps on Tank No. 1 and 2 are missing flex support, have broken cable connectors, and are missing waterproof covers.
- Stormwater Structure – Erosion of soil has occurred around this structure that is adjacent to the front gate entrance and a sewer manhole.
- Irrigation Pump Station – CCU staff reported several issues with the existing breakers. These include not having a proper actuation handle, which prevents them from being operated without opening the cover, in violation of the NEC. This represents a significant issue and should be remedied immediately. The switchgear in this station is also in poor condition, reaching the end of its reasonable service life and should be considered for replacement soon.

6.2.5 OPERATIONS

The East Port WRF produces a high-quality reclaimed water by using biological nutrient removal with an MLE process, clarification, effluent sand/anthracite filtration, and high-rate chlorine disinfection. The WRF can be operated to produce secondary effluent without filtration, but this alternative operation is only used for maintenance purposes, and excess and/or unfiltered effluent is diverted to storage ponds for on-site spray irrigation or disposal in the two on-site deep IWs.

The East Port WRF accepts septic tank waste through two septage pretreatment units. This service provides a necessary waste treatment component for local septage hauling companies that serve locations outside the CCU collection system service area.

The East Port WRF accepts and treats sludge from the East Port, West Port, Rotonda, and Burnt Store WRFs. The East Port WRF sludge-holding capacity experienced issues in 2019, 2020, and 2021 when receiving increased volumes of waste sludge from all four WRFs. The limited sludge-storage capacity results in reducing the frequency of sludge hauling trips to the East Port WRF from the other facilities, which reduced wasting volumes and frequency and, as a result, reduced performance. The operators at the West Port and Rotonda WRFs have also expressed concerns with the limited capabilities to haul sludge by truck to the East Port WRF, resulting in a reduction in the ability to waste sludge at the West Port and Rotonda WRFs.

As part of the East Port WRF expansion, which is under construction, the sludge-storage capacity at the East Port WRF will be increased to handle projected volumes of sludge from the East Port WRF and the other facilities and additional sludge dewatering provided. Sludge thickening can be evaluated at the other facilities to reduce waste sludge volumes (up to a factor of 3), the number of hauling events, and the required volume at the East Port WRF sludge aerobic digester.

The East Port WRF is staffed 24 hours per day, 7 days a week by licensed operators who also monitor the other WRFs within the CCU system 24 hours per day. Alarms are evaluated, and operators or maintenance personnel are dispatched to take corrective action, if necessary.

6.2.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.2.7 Review of Previous Report Recommendations

Stages 1 and 2 of the East Port WRF upgrade were completed in FY 2016. Stage 5 Reclaimed Water Improvements were completed in FY 2019 and put into operation in March 2020. The expansion to 9.0 MGD, with many processes designed to accommodate future expansion to 12.0-MGD, is in progress. Construction of the 9.0-MGD expansion is underway and expected to be completed Fall 2026. The future construction expansion to 12.0 MGD will be done as funding, growth, and development dictate. Table 6-6 summarizes the 2022 recommendations and status of each item.

Table 6-6 East Port WRF 2022 Recommendations and Status

Recommendation:	Prepare an MIT plan for IW-1 for approval by FDEP. The next MIT should be completed and submitted to FDEP before September 4, 2024.
Progress:	Not started.
Recommendation:	Convey digester decant, in-plant Pump Station No. 1 and No. 2 plant recycle flows into the EQ tank once expansion is complete.
Progress:	This will be completed after construction of the 9.0-MGD expansion.

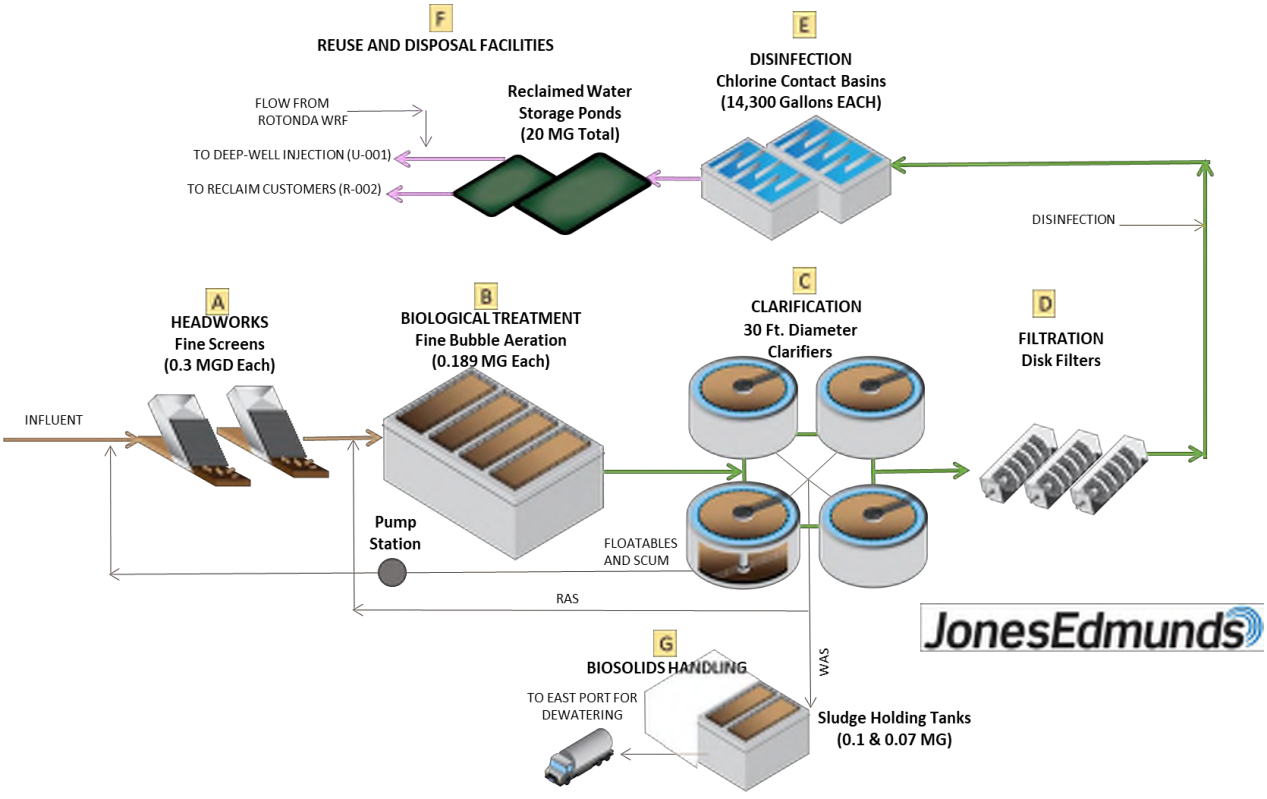
Recommendation:	Replace the irrigation pumping station electrical switchgear.
Progress:	This will be completed as part of the 9.0-MGD expansion.
Recommendation:	Revise fiber optic network for physical redundancy.
Progress:	Not completed.
Recommendation:	Repair hurricane-related damage.
Progress:	Ongoing.
Recommendation:	Repair damaged conduits, connectors, and conduit supports throughout the plant.
Progress:	In progress. Some will be repaired or replaced as part of the 9.0-MGD expansion.
Recommendation:	Repair construction trailer and restore plumbing operations.
Progress:	Completed.
Recommendation:	Provide a fixed panel cover over the CCC.
Progress:	Not completed. Covering the existing and new CCCs is part of the 9.0-MGD expansion.
Recommendation:	Add PLCs to SCADA.
Progress:	Not completed.
Recommendation:	Replace hose bibb connections at the headworks.
Progress:	Not completed.
Recommendation:	Repaint all faded or chipped paint on aboveground piping and pumps within the next 2 to 3 years.
Progress:	Ongoing.
Recommendation:	Replace insulation for Probe SC100 piping on Oxidation Ditch No. 2.
Progress:	Not completed.
Recommendation:	Build the Central Control Center at East Port WRF.
Progress:	Not completed.
Recommendation:	Improve septage billing.
Progress:	Not completed.
Recommendation:	Include more bird deterrents near the clarifiers.
Progress:	Additional bird deterrents were added to the headworks. Existing clarifiers had some bird deterrents added, but additional measures are needed.
Recommendation:	Rails for the backwash mechanism at the filters are in fair condition, but the wall support is beginning to rust. The wall support should be painted.
Progress:	Rehabilitation of the filters is ongoing, and the media will be replaced as well.
Recommendation:	Replace the base of the pump heads at HSPS No. 1 and the Pond Transfer Pumps.
Progress:	This will be addressed in the 9.0-MGD expansion.

6.3 West Port WRF

The West Port WRF is in the Gulf Cove area of West Charlotte County at 15005 Cattle Dock Point Road, Port Charlotte, Florida. This WRF was upgraded in 2005 and has a current permitted capacity of 1.20 MGD AADF. The West Port WRF uses an activated sludge process to treat domestic wastewater collected from part of the West County service area. The West Port WRF is permitted to distribute reclaimed-quality water to unrestricted public-access reuse sites and inject into a deep well injection system. Two diesel-powered emergency generators with ATSs provide standby power to the WRF.

Figure 6-3 shows the West Port WRF process flow diagram.

Figure 6-3 West Port WRF Process Flow Diagram



A) Headworks: Raw wastewater from the West County service area collection/ transmission system enters the headworks where it is screened to remove large inorganic material by four rotary influent screens. A manual bar screen is also available for bypass purposes. Screenings are collected in a dumpster and hauled to the landfill

for disposal. Internal plant flows from the on-site pump station are introduced at the bar screens.

B) Biological Treatment: Screened wastewater is split equally into four aeration basins where aeration and microorganisms are used to treat biodegradable material. Blowers aerate the wastewater through fine-bubble diffusers in each aeration basin.

C) Clarification: Flow from the biological treatment process is split between four secondary clarifiers for solids separation. The clarifiers have rotating skimmer arms to remove floatables and scum before the effluent flows over a circumferential weir. Telescoping valves adjust sludge withdrawal from the bottom of each clarifier and convey it to the sludge-return chamber. The sludge exits the return chamber where it is conveyed to the front of the aeration basins as RAS to replenish the microbial community or to the sludge holding/aerobic digestion tanks as WAS.

D) Filtration: Clarified water enters three automatic cleaning, disc-type cloth media filters for tertiary filtration to remove the remaining solids. The filters are housed in individual steel tanks.

E) Disinfection: The filtered water enters the CCCs where liquid sodium hypochlorite is dosed for disinfection. Only one chamber is currently in use.

F) Reuse and Disposal Facilities: Reclaimed-quality water is pumped to two lined storage ponds for storage and distribution to the reclaimed water system. Excess reclaimed water and water not meeting reclaimed water standards are pumped to the Class I injection well by three equally sized pumps. The West Port and Rotonda reclaimed water systems are interconnected, allowing Rotonda WRF to dispose of excess reclaimed water using the injection well.

G) Biosolids Handling: WAS is pumped from the clarifiers to the sludge-holding tanks where blowers provide aeration through coarse-bubble diffusers. The sludge is gravity thickened and decanted before being hauled to the East Port WRF for aerobic digestion, dewatering, and transport to the Charlotte County Zemel Road Landfill where it is processed into compost available for sale as a soil conditioner.

6.3.1 Regulatory Considerations

The West Port WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern the plant operations:

- Plant Operating Permit (FLA014048) – Expiration Date: February 24, 2026.
- Deep Well (IW-1) Permit (0330461-002-UO/1M) – Expiration Date: May 4, 2026.
  - The last MIT was performed on IW-1 on June 17, 2020. The next MIT will be due by June 16, 2025.

6.3.2 Wastewater Flows and Loads

The West Port WRF permitted capacity is 1.20 MGD AADF. At the end of FY 2023, the AADF was 0.73 MGD, and the West Port WRF was operating at 61 percent of the plant permit

capacity. The highest MDF occurred in August 2023 at 1.35 MGD. The highest TMADF of 0.85 MGD occurred in November 2022, which is 71 percent of the plant permit capacity. Table 6-7 summarizes influent flows as reported in the DMRs.

Table 6-7 West Port WRF Influent Flows in FY 2023

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)[1]
Oct-22	0.82	0.79	0.83	1.14	69
Nov-22	0.84	0.80	0.85	1.02	71
Dec-22	0.82	0.80	0.83	0.88	69
Jan-23	0.84	0.81	0.83	0.92	69
Feb-23	0.84	0.81	0.83	0.90	69
Mar-23	0.81	0.81	0.83	0.88	69
Apr-23	0.65	0.80	0.77	0.85	64
May-23	0.58	0.79	0.68	0.65	57
Jun-23	0.58	0.77	0.60	0.72	50
Jul-23	0.57	0.75	0.58	0.62	48
Aug-23	0.72	0.75	0.62	1.35	52
Sep-23	0.75	0.73	0.68	0.88	57

[1] Permitted capacity = 1.2 MGD AADF, measured at monitoring site FLW-01.

In FY 2023, the average annual influent load for BOD was 780 lb/day and for TSS was 1,294 lb/day. The maximum monthly average BOD load was 1,212 lb/day, occurring in November 2022. The maximum monthly average TSS load was 2,606 lb/day, also occurring in November 2022. Table 6-8 summarizes the wastewater characteristics of the West Port WRF influent.

Table 6-8 West Port WRF Influent Water Quality in FY 2023

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-22	132	903	363	2,482
Nov-22	173	1,212	372	2,606
Dec-22	135	923	191	1,306
Jan-23	140	981	215	1,506
Feb-23	134	939	162	1,135
Mar-23	145	980	177	1,196
Apr-23	110	596	125	678
May-23	118	571	131	634
Jun-23	96	464	128	619
Jul-23	97	461	166	789
Aug-23	112	673	245	1,471
Sep-23	104	651	177	1,107

Note: [1] Measured at monitoring site INF-01.

6.3.3 Treatment Objectives and Effluent Quality

The West Port WRF is designed to treat wastewater to two effluent standards – one for disposal to the deep injection well (U-001) and the other for public-access reuse (R-002), which requires high-level disinfection. Table 6-9 lists the flow and primary water quality requirements for each effluent reuse and disposal method.

Table 6-9 West Port WRF Effluent Requirements

Reuse/Disposal Method	R-002	U-001
Max Flow (MGD)	Report[a,b]	4.75[e]
Max BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	20[a] /30[b] /45[c]/60[d]
Max TSS (mg/L)	5[d]	20[a] /30[b] /45[c]/60[d]
Total Fecal (#/mL)	25[d]	Not Applicable

Notes: Statistical Bases – [a] annual average; [b] monthly average; [c] weekly average; [d] single sample; [e] instantaneous maximum.

Table 6-10 summarizes the effluent flow and water quality of the West Port WRF. In FY 2023, the annual average effluent flow for the reuse system (R-002) was 0.51 MGD. The maximum daily flow of the underground injection well (U-001) was 2.76 MGD, indicating that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values were 2.8 mg/L and 4.9 mg/L, respectively, showing that no violations of the single-sample limits for BOD or TSS were recorded in FY 2023. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2023. The maximum fecal coliform counts exceeded 1/100 mL in 7 months occurring in October and November 2022, and February, March, May, June, and September 2023. Compliance was maintained during these events by discharging the effluent via U-001.

Table 6-10 West Port WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method		Water Quality		
	R-002 Monthly Avg. Flow (MGD)[1]	U-001 Max. Day Flow (MGD)[2]	Maximum BOD Conc. (mg/L)[3]	Maximum TSS Conc. (mg/L)[4]	Maximum Fecal Count (#/100mL)[3]
Oct-22	0.22	2.47	2.0	4.9	205
Nov-22	0.45	2.71	2.0	1.4	7.5
Dec-22	0.47	1.90	2.3	0.4	1.0
Jan-23	0.78	0.47	2.3	2.3	1.0
Feb-23	0.99	1.12	2.8	1.6	24.3
Mar-23	0.38	0.74	2.0	1.6	1,733
Apr-23	0.63	0.22	2.0	2.1	1.0
May-23	0.48	0.26	2.0	2.1	2.0
Jun-23	0.42	0.08	2.0	1.4	3.1
Jul-23	0.51	0.07	2.0	1.4	1.0
Aug-23	0.31	2.76	2.0	2.5	1.0
Sep-23	0.44	2.31	2.0	2.0	2.0

Notes: [1] Monitoring site FLW-04; [2] Monitoring site FLW-02; [3] Monitoring sites EFA-01 and EFA-02; [4] Monitoring site EFB-01.

6.3.4 Treatment Components and Condition Assessment

Jones Edmunds completed an on-site review of the WRF on January 31, 2024. Our personnel met with Thomas Cimino, Chief Operator of the West Port WRF, to review plant conditions, operations, and records. Access to the facility is through a secure gate in a fence that extends to a water moat surrounding the WRF and reclaimed water storage ponds. A warning sign is on the access gate and multiple warning signs are outside the moat near the property boundary.

In general, the plant site is well kept and maintained. Staff has done a good job with groundskeeping and facility appearance. The area of mowed grass outside the reclaimed water storage pond is an aesthetic welcome to plant visitors. The Operations Building and shop area are clean and organized.

The plant operators continue to exercise all valves regularly. All compliance meters are calibrated every 6 months, and calibration tags were up to date at the time of the site visit.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operators' licenses.
- Facility logbook.
- Facility SOPs and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium every 2 years).
- Reports required to complete the last permit application.
- Certification of EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-Custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow-Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF. The Chief Operator has prepared a binder of required documents that is readily available for inspection.

6.3.4.1 WRF Influent Sampling Location

The WRF includes a 24-inch influent force main and 16-inch flow meter assembly that have been in service since January 2014. The influent water quality sampling location (INF-01) and flow monitoring locations are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition. The flow meter was calibrated in November 2023.

6.3.4.2 Headworks

The overall condition of the headworks structure was considered good at the time of the site visit. In 2021, the County completed a headworks rehabilitation project where the headworks structure, pumps, and piping were re-coated; all four drum screens were replaced; and four new chain-operated influent valves were installed. The drum screens and rotating equipment are subject to corrosion due to hydrogen sulfide. Odor control through chemical addition has been added before the headworks toward the entrance to the plant. This will help extend the service life of the drum screens and other equipment. The bottom of the headworks structure and dumpster appeared to be clean and orderly.

A fiberglass grating over the influent flow splitter area had been supported by two carbon-steel beams. These beams were replaced with aluminum beams in FY 2015. The fiberglass grating is showing minor signs of fraying.

The WRF has no grit removal system. Grit usually accumulates in aeration basins and at the on-site lift station. Grit is removed from the system periodically by vacuum trucks. The Chief Operator indicated that the vacuum truck has easier access to the outer basins than the inner basins that require more physical labor to remove grit.

Although the lack of a grit removal system is an issue, the grit content of the wastewater entering the WRF is probably lower than most plants because nearly all flow is received from septic tank effluent pumps.

6.3.4.3 Flow Equalization

The West Port WRF does not have flow EQ storage for peak-hour flows. Introducing flow EQ would improve the efficiency and capacity of plant operations. An alternative would be to install VFDs on the major lift stations that directly pump to the WRF. Flow EQ will be added as part of the West Port WRF 5.0-MGD expansion that is currently in the preliminary design phase. This will be a separate project that will be completed before the full expansion project.

6.3.4.4 Biological Treatment

The overall condition of the activated-sludge facilities is good. The mixed liquor suspended solids (MLSS) are sampled every morning by the Operations staff. The WRF has four aeration basins – all basins were in service at the time of the site review. New fine-bubble diffusers were installed in all basins in 2013 and 2014. This has had a positive effect on the treatment process by providing a more even air flow distribution. However, the lack of grit removal continues to present a maintenance challenge since deposited grit levels rise to block the diffusers. Basin No. 3 was cleaned of grit, and damaged aerators were repaired in FY 2016. At the time of the site visit, Basin No. 4 was offline for cleaning. Overall, wastewater in the aeration basins was well-mixed with some foam accumulation at the surface.

All three blowers were operating properly. Usually, one blower is operated at a time to meet aeration requirements. The operators cycle the blowers weekly. The plant typically operates between a pH of 6.6 and 6.7 but adjusts seasonally by running an additional blower. A timer is used to turn the blower on and off throughout the day. Using pH for operational control is not the most practical method for treating wastewater; an alternate control method including DO and oxygen-reduction potential (ORP) should be evaluated. The outlet weirs of the aeration tanks require manual cleaning when debris catches on the weirs. The steel supports of the walkway over the aeration tank effluent splitter box were touched up with paint in FY 2017, and the aeration tanks were repainted in 2018.

6.3.4.5 Clarification

Although most of the unit process tanks are made of concrete or Type 304 stainless steel, the four secondary clarifiers consist of carbon steel and require constant paint maintenance every 2 years. The overall condition of the clarification process is fair. High sudden increases in influent flows can cause further issues with the clarifier performance when one of the four clarifiers is out of service. Installing submerged stamford baffling in the clarifiers could aid with sludge settlement and prevent solids from billowing up the walls and potentially entering the effluent launder.

The operator noted that the rubber on the skimmer arms was recently replaced, which provided even contact on the water surface as they traveled around the clarifiers. The feed well had noticeable foam that would occasionally exit from the feed well into the main part of the clarifier.

Plant Operations staff follow a routine schedule of clarifier inspection, repair, and painting. The stairways leading to the bridges of the aboveground clarifiers were painted in 2020. The Fiberglass grating and steps show signs of moderate fraying and wear.

Overflow weirs are sprayed daily and brushed every 2 weeks to keep them clean. The overflow weirs were leveled in FY 2017. New weirs were installed in Clarifier No. 1 and Clarifier No. 2 in 2018. Clarifier No. 3 and Clarifier No. 4 received new weirs in FY 2020 and FY 2021, respectively.

The sludge-return chambers on the side of each clarifier have telescoping valves used to adjust sludge withdrawal from the bottom of the clarifier. The sludge is then conveyed to the four RAS/WAS pumps that are housed under a sheet-metal roof. Floatables accumulate in the sludge chambers and are periodically removed by manually skimming the 5-foot-by-5-foot boxes from the clarifier bridge when the chambers are full. The telescopic valves were operating properly, and the RAS/WAS pumps are in good operating condition. The pumps were painted in 2017.

6.3.4.6 Filtration

The filters are in good condition. The tanks are cleaned every month with 5 gallons of bleach. A UV cover was put on the filter tanks and then removed because access to the filters during maintenance activities was blocked. Also, using the UV cover requires weekly cleaning due to increased bug life beneath the UV cover. The filter water surface, exposed interior equipment, and interior tank walls are sprayed with a bleach solution once or twice a week by Operations staff to prevent algae growth. Regular bleach spraying mitigates algae growth but may cause long-term issues in with exposed components such as motors. The filter will likely be replaced as part of the future expansion.

Three filters were in operation at the time of the site visit and were working properly. All three filters were using the same filter cloths that were replaced in 2021. The Chief Operator stated that a higher-quality effluent is obtained when all three filters are operating in parallel.

The filters are constructed of Type 304 stainless steel, but the fiberglass grating platform between the filters is supported by carbon steel angles. The paint is in good condition with some staining and rust on some exposed components that are not stainless

steel such as the motors, which were replaced in 2021. The motor chains were in good condition and appeared to be functioning properly in the operational filters.

The control panels and meter readouts for the three filters are under an aluminum cover. The turbidity sampling point is located to receive the combined flow of all three filters. The control panels and turbidimeter are in fair condition.

6.3.4.7 Disinfection and Effluent Sampling

The overall condition of the chlorination system is excellent with the exception of the permanent roof structure. The roof was blown off due to wind damage when Hurricane Ian made landfall in September 2022. This roof and others that were damaged are expected to be replaced or repaired in FY 2024. Only CCC No. 1 was in service at the time of the site visit. CCC No. 2 was reported to be in good working condition. Each CCC has two trains. Good turbulent flow in the inlet boxes to the CCCs creates effective mixing. The pH and chlorine analyzers are in good working order. Plant operators clean the analyzer assemblies at regular intervals to remove any algae buildup. They also periodically alternate the CCCs to clean them.

In June 2017, a new chlorine feed system with two chemical feed pumps for each CCC and new storage tanks was installed in a new chlorine storage and feed area between the two CCC structures. This will enable two parallel CCCs to operate when peak hourly flows exceed 955 gpm. The new dosing pumps have double-containment protection.

The CCC effluent is monitored by the effluent composite water quality sampler (EFA-01). The overall condition of the effluent monitoring, storage, and disposal system is good.

6.3.4.8 Reuse, Disposal, and Storage

Reuse Facilities

The West Port WRF reclaimed water pump station feeds part of the MRS that interconnects with the Rotonda WRF and the East Port WRF reclaimed water systems. The station contains two reclaimed water HSPs and one jockey pump. This provides flexibility to serve existing and future reclaimed water customers. The two reclaimed HSPs were replaced in 2021. The main customer for the reclaimed water produced at the West Port WRF is the Coral Creek Golf Club Golf Course, which receives reclaimed water

through a 7-mile-long, 10-inch-diameter main constructed by the golf course owners. Chapter 7 provides additional information about the MRS.

The West Port WRF has two lined reclaimed water storage ponds – one 5 MG and one 15 MG. The stored water can be pumped to the reclaimed water distribution system or the deep injection well. The ponds had some algae growth at the time of inspection. The Chief Operator reported in the last Annual Report update that they plan to add some fine-bubble diffusers to the pond in the future.

Reject Storage and Disposal

Effluent that does not meet public-access reclaimed water standards is conveyed to a clearwell for disposal via a deep injection well. Three new deep-well pumps are used to convey effluent through a 16-inch manifold pipe into the deep well. All compliance monitoring equipment and pumps were fully functioning and in good condition at the time of the inspection. The building housing the pumps suffered wind damage when Hurricane Ian made landfall in September 2022.

MIT for the deep injection well will be performed in 2025. Any effluent not meeting reclaimed water standards during the testing period will be automatically diverted to the existing on-site sprayfields. The Chief Operator is also considering using the 5-MG wet-weather storage pond as a temporary reject pond for the MIT test, but it will require cleaning before it can be used for reclaimed water storage again.

Wet-Weather Storage

The on-site reclaimed water ponds provide up to 20 MG for wet-weather storage of reclaimed water. At the time of the site visit, the pond linings appeared to be in good condition. The ponds had some algae growth at the time of inspection. The Chief Operator reported in the last Annual Report update that they plan to add some fine-bubble diffusers to the pond in the future.

6.3.4.9 Biosolids Handling

The sludge produced as a byproduct of treatment is pumped to aerobic sludge-holding tanks and then gravity thickened at the West Port WRF before being truck hauled in liquid form to the East Port WRF for sludge dewatering and final disposal at the compost facility. The overall condition of the sludge-holding tanks is good; however, the aerobic sludge-holding tank volume is too small and prevents proper decant thickening, resulting in a decant-thickened sludge of 1-percent solids or less. Additional sludge-holding tank volume and decant-thickening capabilities should be provided to allow a thickened sludge of 1.5- to 2.0-percent total solids, which will reduce the sludge-hauling volume by 50 to 100 percent and hauling costs. CCU is evaluating the feasibility of adding more biosolids-handling capacity at the West Port WRF to handle biosolids generated at the West Port and Rotonda WRFs.

Sludge is transferred between tanks and loaded onto tanker trucks by a sludge-transfer pump. Valve changes determine where sludge is directed. The liquid sludge load-out pump was replaced in 2017. The WRF has four emergency sludge-drying beds. Typically, two are used for the on-site collection system and two are used for emergency plant operations.

The Chief Operator indicated that the plant is experiencing limited hauling issues with sludge hauling services, and excess sludge stored in the biosolids-handling facilities has not exceeded system capacity. The situation is being closely monitored by Operations staff. The expansion of the storage and dewatering at the biosolids handling facilities at East Port WRF is currently part of the ongoing 9.0-MGD expansion project to increase the receiving capacity from West Port WRF.

Electrical Components and Circuitry

The incoming switchgear and distribution transformer appear in good condition with no obvious signs of significant concern. The incoming power via overhead aerial was installed a few years ago. The WRF is served from two 400-kVA generators connected in parallel that are fed from a subbase tank and an auxiliary tank adjacent to them. A 6,000-gallon fuel tank and pad for the generators was installed in 2020; however, the Chief Operator reported issues with the tank's functionality and expects the tank to be removed and/or replaced in the future. Overall, the electrical equipment is in good functioning condition based on information from the Operations staff, except for the generator MCC building's roof and side panels due to wind damage when Hurricane Ian made landfall in September 2022. Additionally, the hurricane caused some water damage to computer equipment. Generators were used during the entirety of the storm; however, Generator Set No. 2 was damaged and is pending repairs. The repairs to the building and any outstanding equipment will take place in FY 2024.

Additionally, an electrical equipment site visit assessment was conducted by the Jones Edmunds Electrical Engineer on February 21, 2023. No specific issues were reported by Operations staff. The incoming power to the plant was upgraded a few years ago and would have sufficient capacity for a significant plant upgrade; however, the internal power systems would require upgrades.

Overall, the following deficiencies were noted:

- Generator Set No. 2 was out of service due to Hurricane Ian. The generator vendor states a new generator is required.
- Staff indicated issues with incoming power where imbalance occurs and trips the blower breakers; staff indicated they plan to monitor and record power to verify this.
- The lighting panel in MCC No. 1 is missing a cover.
- The electrical room adjacent to the generator set was damaged due to Hurricane Ian; the facility is missing the roof, and CCU has installed a temporary cover.
- Sludge bed sump pump conduit broken.
- Blower MCC building outside conduit cover is open.
- MCC Building No. 2 outside conduit cover is open.
- Digestor No. 2 area light conduit support is missing.
- Clarifier No. 1, 2, 3, and 4 are missing conduit clamps on area lights.
- Clarifier No. 1 and 2 have broken conduit and are missing a line-box-style fitting cover.
- The conduit supports on the north wall of the headworks/aeration basin have broken, leaving the conduit unsupported.

6.3.5 OPERATIONS

The West Port WRF produces reclaimed water using biological treatment, cloth filtration, and high-level chlorine disinfection. The plant can be operated to produce secondary effluent without filtration, but this alternative operation is rarely used.

The West Port WRF is staffed 16 hours per day, 7 days per week. Key plant components are automatic with continuous effluent monitoring, allowing the plant to produce high-quality effluent 24 hours per day. The East Port WRF operators monitor the operations of the West Port WRF 24 hours per day through a County-wide telemetry system. Alarms are evaluated, and operators or maintenance staff can be dispatched to the West Port WRF to address issues, if necessary. Effluent not meeting the reclaimed water standards is automatically diverted to the deep injection well for disposal. Reclaimed water is also automatically diverted to the deep injection wells when the reclaimed water storage ponds are full.

6.3.6 MAINTENANCE

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.3.7 Review of Previous Report Recommendations

Table 6-11 West Port WRF 2022 Recommendations and Status

Recommendation:	Repair wind damage to the CCC's roof, the generator MCC building, and the deep well injection pump building.
Progress:	In progress; a Contractor has been selected and mobilized.
Recommendation:	Complete evaluation for expansion of West Port WRF.
Progress:	Completed. The design for the expansion to 5.0-MGD is currently in progress.
Recommendation:	Resolve hydraulic constraints in the irrigation wetwell for the injection well pumps to allow disposal of excess reclaimed water from West Port during wet-weather events.
Progress:	Will be resolved as part of the future 5.0-MGD WRF expansion.
Recommendation:	Clear and recondition the stormwater pond near the headworks.
Progress	Ongoing. Continue to clear and recondition as needed.
Recommendation:	Install a galvanized metal frame and UV cover above each filter tank to prevent algae growth in the filters.
Progress:	The Chief Operator stated that a cover would prevent access and therefore does not plan to do it. The CCU WRF staff routinely spray the area with bleach to inhibit algae growth
Recommendation:	Inspect the reclaimed water HSP pumps to evaluate the condition of shafts and other components.
Progress:	One HSP was replaced, and the motor on the other was rebuilt.
Recommendation:	Replace the DH+ Network.
Progress:	In progress; estimated to be completed in FY 2024. The fiber optic cables have been installed and are awaiting final programing and testing.
Recommendation:	Secure all electrical switch gear to prevent unauthorized access or inadvertent exposure to live parts.
Progress:	Partially completed with locks added to doors; awaiting repair to damaged buildings from Hurricane Ian that will be completed in FY 2024.

6.4 Rotonda WRF

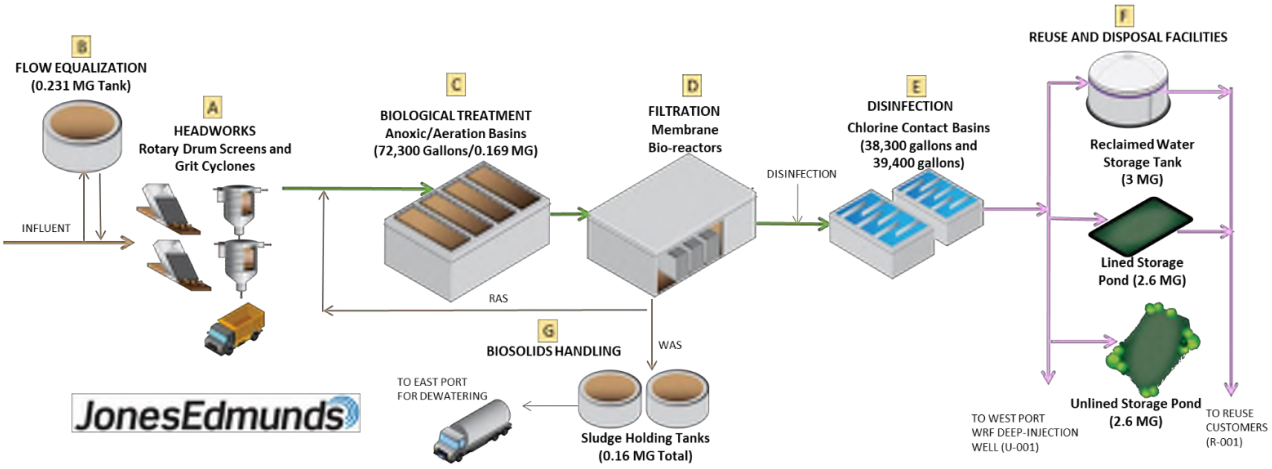
The Rotonda WRF is at 3740 Kendall Road, Rotonda West. This facility was purchased by Charlotte County from a private utility, Aqua Source, in 2000. The Rotonda WRF is permitted to distribute reclaimed-quality water to unrestricted-public-access reuse sites and to use the West Port WRF deep well injection system. The Rotonda WRF serves the west side of the Placida Peninsula including the inside of the circular Boundary

Boulevard of the 7.5-square-mile Rotonda development; areas filling in the northeast and northwest corners outside the circular development; and adjacent areas along Cape Haze Boulevard, Pine Valley, White Marsh, Long Meadow, Broadmoor, Pinehurst, Pebble Beach, Oakland Hills, and Cape Haze neighborhoods.

A phased plant expansion was completed during FY 2009 and was cleared for service by FDEP on November 19, 2009. The expanded facility has a rated treatment capacity of 2.0 MGD AADF and a rated reclaimed water disposal capacity of 1.005 MGD AADF. The site has space for expansion to increase the capacity to 3.0 MGD. The Rotonda WRF uses activated sludge in an MBR configuration to treat wastewater.

Effluent can be distributed as reclaimed water to the unrestricted-public-access MRS or transferred to West Port for injection into a deep well injection system. Figure 6-4 shows the Rotonda WRF process flow diagram. Two diesel-powered emergency generators in an on-site building have ATSs for providing emergency power to the WRF.

Figure 6-4 Rotonda WRF Process Flow Diagram



The Rotonda WRF treatment process consists of the following components:

A) Headworks: Raw wastewater from the West County service area enters the Rotonda WRF headworks for screening and grit removal. Two Baycor rotary drum fine screens remove larger inorganic material. Grit removal is achieved in two grit concrete tanks immediately downstream of the rotary drum screens. Settled grit is pumped through two grit cyclones and one grit "snail" washer to remove organics. Solids removed by these two processes are collected and hauled to the landfill for disposal. Flows from the on-site lift station are introduced here.

B) Flow Equalization: During peak flows, excess wastewater pours over a weir at the headworks and is diverted to a 300,000-gallon EQ tank. Pumps at the EQ tank return the wastewater to the system as influent flows return to average conditions. The EQ tank is equipped with two forced-air pumps to maintain the biological medium and prevent hypoxic conditions.

C) Biological Treatment: Wastewater from the pretreatment structure enters two activated-sludge treatment trains that consist of an aerobic zone, anoxic zone, and swing zone that can be an aeration or anoxic zone. This configuration allows the

biodegradation of organics and removal of excess nitrogen. Blowers and fine-bubble diffusers are used to provide oxygen to the wastewater in the aeration zone.

D) Filtration: From the biological treatment process, the wastewater flows to the four MBR filtration trains. Each train contains three cassettes. Hollow-tube membranes housed in individual cassettes provide a high level of filtration and take the place of secondary clarifiers and tertiary filters used at the other WRFs. The cassettes are periodically emptied and refilled with sodium hypochlorite during cleaning events. Sludge produced in the treatment process is pumped to two locations – to the aeration basins as RAS to support microbial activities and to the two sludge-holding tanks as WAS.

E) Disinfection: The filtered water enters the CCC splitter box that directs the flow into one of two CCCs. Three chlorine feed pumps introduce liquid sodium hypochlorite for reclaimed water disinfection requirements. The chlorine is thoroughly mixed using a static mixer in the CCC influent pipe. The sodium hypochlorite is controlled by flow meters on the MBR effluent piping. The three sodium hypochlorite storage tanks have a total usable capacity of 4,080 gallons.

F) Reuse and Disposal Facilities: Reclaimed water enters the on-site 3.0-MG GST and a 2.64-MG reclaimed water storage pond. An on-site pump station provides flow to the reclaimed water transmission system that is interconnected with the MRS. During wet weather, excess reclaimed water can be disposed of in the West Port WRF deep injection well.

   The Rotonda WRF also has a lined reject pond with a storage capacity of 5.182 MG. Water is diverted to this pond when it does not meet the unrestricted-public-access reclaimed water quality standards and must be retreated through the WRF.

G) Biosolids Handling: WAS pumped to the two sludge-holding tanks (170,000-gallon total capacity) is gravity thickened and hauled to the East Port WRF for aerobic digestion and dewatering. The tanks are converted clarifiers with center surface aerators. Decanted supernatant recirculates to the headworks. Thickened sludge is hauled to the East Port WRF for digestion, dewatering, and final disposal at a compost facility at the Charlotte County Zemel Road Landfill.

6.4.1 Regulatory Considerations

The Rotonda WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permit governs plant operations:

- Plant Operating Permit (FLA014098) – Expiration Date: May 30, 2027.

6.4.2 Wastewater Flows and Loads

The Rotonda WRF's permitted capacity is 2.0 MGD AADF. In FY 2023, the AADF was 1.13 MGD, and the Rotonda WRF was operating at 57 percent of the plant permit capacity. The MADF of 1.48 MGD occurred in October 2022. The maximum TMADF of 1.49 MGD occurred in November 2022, which is 75 percent of the plant permit capacity, demonstrating the influence of wet weather and I/I on flows to the facility. Table 6-12 summarizes influent flows as reported on DMRs in FY 2023.

Table 6-12 Rotonda WRF Influent Flows in FY 2023

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-22	1.48	1.19	1.45	2.19	73
Nov-22	1.34	1.20	1.49	1.88	75
Dec-22	1.16	1.21	1.33	1.32	66
Jan-23	1.10	1.21	1.20	1.16	60
Feb-23	1.06	1.21	1.11	1.27	55
Mar-23	0.98	1.20	1.05	1.06	52
Apr-23	1.01	1.21	1.01	1.11	51
May-23	0.93	1.20	0.97	1.01	48
Jun-23	0.97	1.17	0.97	1.31	48
Jul-23	1.00	1.16	0.97	1.12	48
Aug-23	1.22	1.16	1.06	2.63	53
Sep-23	1.38	1.13	1.20	1.85	60

[1] Permitted plant capacity 2.0 MGD.

In FY 2023, the average annual influent load for BOD was 1,049 lb/day and for TSS was 1,247 lb/day. The maximum monthly average for BOD load was 1,415 lb/day occurring in May 2023. TSS load typically exceeded 1,000 lb/day. The maximum monthly average TSS load was 1,687 lb/day, occurring in April 2023, which corresponds with seasonal residents. Table 6-13 summarizes the wastewater characteristics of the Rotonda WRF influent in FY 2023.

Table 6-13 Rotonda WRF Influent Water Quality in FY 2023

Month	BOD		TSS	
	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration (mg/L)[1]	Monthly Avg. Load (lb/day)
Oct-22	73	912	105	1,303
Nov-22	92	993	94	1,018
Dec-22	130	1,285	145	1,437
Jan-23	130	1,185	137	1,246
Feb-23	152	1,317	182	1,576
Mar-23	162	1,294	181	1,452
Apr-23	145	1,235	200	1,687
May-23	131	1,415	181	1,027
Jun-23	86	656	121	930
Jul-23	86	727	116	985
Aug-23	78	729	101	960
Sep-23	79	834	128	1,337

Note: [1] Measured at monitoring site INF-01.

6.4.3 Treatment Objectives and Effluent Quality

The Rotonda WRF is designed to treat wastewater for two effluent standards: one for disposal to the deep injection well (U-001) and the other for a slow-rate public-access system (R-001)

for which high-level disinfection is required. Table 6-14 lists the flow and primary water-quality requirements for each effluent reuse and disposal method.

Table 6-14 Rotonda WRF Effluent Requirements

Reuse/Disposal Method	R-001	U-001
Maximum Flow (MGD)	Report[a,b]	4.75[a]
Maximum BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	Not applicable
Maximum TSS (mg/L)	5.0[d]	Not applicable
Total Fecal (#/100mL)	25[d]	Not applicable

Notes: Statistical bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample.

Table 6-15 summarizes the effluent flow and water quality of the Rotonda WRF. In FY 2023, the annual average effluent flow for the slow-rate public-access system (R-001) was 1.13 MGD. The maximum daily flow of the well was 2.76 MGD, which included the West Port WRF flows and indicates that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values were 6.2 mg/L and 1.1 mg/L, respectively, showing no violations of the single-sample limits for BOD or TSS were recorded in FY 2023. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2023. The maximum fecal coliform counts exceeded 1/100mL once in August 2023.

Table 6-15 Rotonda WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method		Water Quality		
	R-001 Monthly Avg. Flow (MGD)[1]	U-001 Maximum Daily Flow (MGD)[2]	Maximum BOD Conc. (mg/L)[3]	Maximum TSS Conc. (mg/L)[4]	Maximum Fecal Count (#/100 mL)[3]
Oct-22	1.87	2.47	2.0	0.4	<1
Nov-22	1.35	2.71	2.0	0.4	<1
Dec-22	1.25	1.90	2.0	0.4	<1
Jan-23	1.11	0.47	5.0	0.4	<1
Feb-23	0.98	1.12	5.2	0.4	<1
Mar-23	0.88	0.74	2.0	0.4	<1
Apr-23	0.99	0.22	6.2	0.4	<1
May-23	0.87	0.26	2.0	0.4	<1
Jun-23	0.91	0.08	2.0	1.1	<1
Jul-23	0.94	0.07	4.1	0.5	<1
Aug-23	1.12	2.76	2.0	0.4	5.2
Sep-23	1.33	2.31	2.0	0.4	<1

Note: [1] Monitoring site FLW-03; [2] Monitoring site FLW-02 at Westport WRF;[3] Monitoring sites EFA-01; [4] Monitoring site EFB-01.

6.4.4 Treatment Components and Condition Assessments

Jones Edmunds completed an on-site review of the WRF on January 31, 2024. Our personnel met with Jason Foster, Chief Operator of the Rotonda WRF, to review plant conditions, operations, and records. Access to the facility is through a secure gate in a fence that

surrounds the WRF and effluent storage ponds. The facility site is well maintained, and the equipment is in working condition; however, the MBR filters are nearing the end of their normal lifecycle. Some painted exterior walls and piping showed signs that repainting should continue for FY 2024. A portion of the above-grade piping and HSPS No. 1 were repainted in FY 2021, and larger portions of piping and equipment were repainted in FY 2022. This project is ongoing, and the remainder of the above-grade piping is being repainted in FY 2024.

The plant operators continue to exercise all valves regularly. All compliance meters are calibrated every 6 months, and calibration tags were up to date at the time of the site visit.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection wells.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans (guidance book created in-house).
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium).
- Reports required to complete the last permit application (in process).
- Certification of the EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

The Cross-Connection and Backflow Prevention Manuals are kept at the Reclaimed Water Coordinator's office at the East Port WRF and at the Rotonda WRF Operations building.

6.4.4.1 WRF Influent Sampling Location

The influent water-quality sampling (INF-01) and flow monitoring (FLW-01) locations are clearly marked, and the refrigerated influent composite sampler and flow meter are in good operating condition. The two main influent valves to the headworks screens are inoperable and were scheduled to be replaced in FY 2019. However, this was deferred to FY 2024, and these valves will be replaced as part of the headworks improvement and rehabilitation/ replacement project under construction and expected to be completed in FY 2024. An actuator was added to Screen No. 1 in FY 2019.

6.4.4.2 Headworks

The overall condition of the headworks is fair to poor. The headworks is undergoing an improvement and rehabilitation/replacement project that will include new piping and fine screens as well other improvements to the headworks.

At the time of the site visit, both screens were operational. These screens are critical process units. Each screen rotates on four drum rollers that support the stainless-steel perforated screen as it rotates. The worn rollers were last replaced in 2016. The rate of rotation has been slowed to extend the life of mechanical components. In 2017, the drums were welded, and the roller wheels, chains, and drive gears were replaced. A wash water spray was added to the screening compactors, which improved operation and lengthened the life of the lower bearing units. The chain and sprockets of Screen No. 2 were replaced in FY 2019. The drum screen roller drive and drum gears for each unit were replaced in FY 2021. The Chief Operator informed us that the replacement screens have been ordered and are expected to be installed in FY 2024 as part of the Headworks Improvement project.

In 2020, the screening handlers (conveyors, compactors, etc.) were replaced with stainless steel and half-pipe corrugated HDPE chutes. The replacement system is operating as intended. The grit removal process operates as intended. The organic wastewater component of the pumped mixture is returned to the wetwells. Separated grit slurry is pumped to two cyclone units where the grit is further concentrated. The separated grit passes to a grit "snail" washer before being deposited into a dumpster. The grit "snail" washer includes a conveyor system that allows the grit to shed water as it proceeds to the dumpster. In FY 2017, Grit Pump No. 2 was replaced, and the cyclones are scheduled for replacement in FY 2024 as part of the Headworks Improvement project.

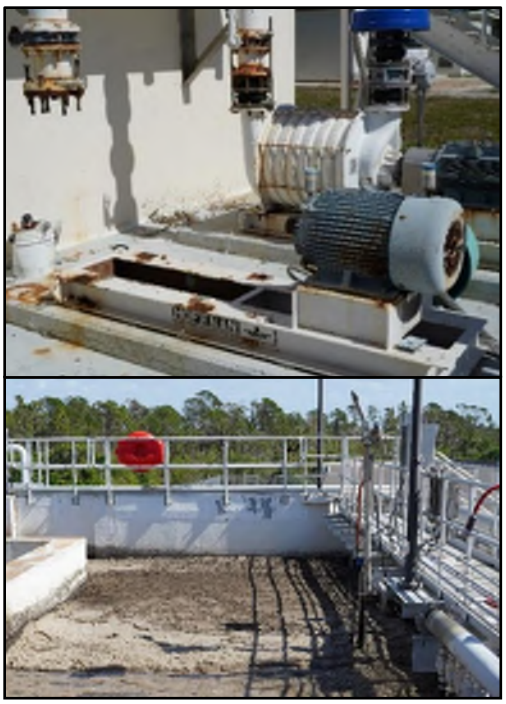
The screenings and grit dumpsters are emptied once per week. The dumpster area is clean with a minor presence of odors.

6.4.4.3 Flow Equalization

The overall condition of the 0.3-MG EQ tank is good. The EQ tank, which attenuates high hourly flows, is filled through a gravity system initiated by an overflow weir at the headworks structure. The EQ tank contents are returned to the headworks for treatment at a steady flow over 24 hours using VFD pumps. This has proven to be a valuable asset to the operation of the facility. In the FY 2022 review, the Chief Operator noted that MLS 801 sends 1,500 gpm to the Rotonda WRF for about 20 minutes and then turns off for 20 to 30 minutes. The operation of the EQ tank has been adjusted to respond to the intermittent discharge from MLS 801. Dry-pit submersible pumps are used to return EQ tank contents to the treatment stream. The EQ tank has an overflow that sends flow to the reject pond and is pumped back to the front of the plant. The Chief Operator noted that this does happen on occasion. The EQ tank positive displacement blowers are run intermittently to save power. Oil sight glasses and fill ports were added by CCU to improve maintenance. The EQ tank was painted in FY 2019. The Chief Operator informed us that an additional EQ tank is necessary to respond to additional surges and continue to maintain a steady flow to the MBRs.

6.4.4.4 Biological Treatment

The overall condition of the activated sludge facilities is good. The aeration tanks operate in a plug flow regime with anoxic, aerobic, and swing zones. The anoxic zones and the use of automatic DO probes to control blower speeds have contributed to the high level of treatment while conserving energy use. The aeration tanks are run at an MLSS concentration of 4,500 to 5,000 mg/L. The aeration tanks were last drained for inspection in FY 2012. The aeration basins were pressure-cleaned and painted in FY 2017. A layer of foam was on the water surface in the anoxic zone at the time of inspection. The Chief Operator commented that additional tank volume is needed to increase denitrification capabilities. We recommended additional mixers in the first anoxic zones.



The aeration system continues to supply air to the aeration tanks. The facility has four multi-stage centrifugal Hoffman blowers to serve the aeration trains with room for an additional blower. Generally, one blower meets air requirements. Additional units are brought online during higher demands. Blower No. 2 has been repaired multiple times including a new motor in FY 2014 and new bearings in FY 2016; however, the blower motor was again repaired in FY 2017. During the site visit, we observed that Blower No. 2 was removed from service; staff reported replacement of Blower No. 2 hardware is ongoing and is expected to occur in FY 2024. Blower Nos. 1 and 4 were replaced in FY 2020 and FY 2019, respectfully. The installed blower and motors were in good condition. The Chief Operator commented that they would prefer three large blowers and two small blowers for better flexibility.

One of the DO probes in the aeration basin was replaced in FY 2017. The Chief Operator commented that one of the DO probes needs the sensors replaced. The other three probes are functioning properly. One DO probe controller screen was severely faded and degraded by UV from the sunlight, and other screens showed similar signs of UV damage. The controller with the damaged screen likely transmits data to plant operations staff via SCADA; however, the damaged controllers should be replaced for field operational purposes. Sun shields were observed on the front of three of the six controller three-sided enclosures; we recommend installing sun shields on the remaining three enclosures to extend the life of the existing equipment.

6.4.4.5 Filtration: Membrane Bioreactor

The MBR system continues to produce a high-quality effluent. The system contains four trains with three membrane cassettes each. The MBRs are cleaned once every other day with a weak solution of bleach to maintain their treatment efficiency and remove organics. The cassettes are periodically cleaned in place with concentrated chlorine bleach twice a year and are removed once a year for citrus cleaning to remove inorganics.

In FY 2017, three mixed-liquor volatile suspended solids (MLVSS) return/recycle pump motors were replaced and are in good working order. The frame on the MLVSS Return/Recycle Pump No. 2 was rehabilitated in FY 2022, and the frame and skid floor were repainted in FY 2022.

A turbidity sample is collected from the MBR effluent header pipe before the flow enters the CCC splitter box. All turbidity meters were replaced in FY 2018.

In May 2019, HDR conducted a membrane evaluation and made the following observations and/or recommendations:

- The membranes are in good condition except for some cracked potting headers.
- Check and adjust the slack within the next few months.
- Purchase a few module blanks for top and bottom headers and wait to observe membrane effluent turbidity spikes, which would indicate that one of the cracked potting headers has breached the membrane integrity. Remove the compromised membrane module and install module blanks in its place until the new purchased membrane module is received. Once the new membrane module is received, install the new membrane in the middle of the cassette and move an existing module where the compromised module was. This could prolong the new membrane module potting header life.
- Continue monitoring and trending membrane permeability data and add temperature to the data collected weekly so that permeability can be corrected with temperature to account for seasonal changes in water viscosity.
- Constantly monitor membrane permeability trend, especially for Trains No. 3 and No. 4, for which end of life is estimated to be FY 2024 and FY 2026, respectively; this trend can accelerate or decelerate.
- A year before scheduled replacement (currently estimated as FY 2024 for Trains No. 1 and No. 3), order membrane modules. Install new membranes modules in Train No. 3. Do not install new membrane modules with existing membrane modules in the same train. Move the existing membrane modules from Train No. 3 to Train No. 4. Train No. 4 will then have six membrane cassettes, which will extend the life of the membranes. The same procedure was recommended for Trains No. 1 and No. 4. Train No. 4 will receive the existing modules, and Train No. 1 will receive the new modules.

6.4.4.6 Disinfection and Effluent Sampling

The overall condition of the chlorination system is good. The two concrete CCCs are in good condition. The CCCs are used alternately, but only one is required to meet the required contact time under current flows. Wind from Hurricane Ian in September 2022 caused the UV filter cloth and metal roof to be blown off the CCC, and it was still missing at the time of our site visit. During the site visit, neither CCC had a UV filter cloth.

Replacement of Chlorine Storage Tank No. 3 began in FY 2017 and finished in FY 2018. Two new storage tanks with secondary containment were installed in FY 2021. All storage tanks feature polyethylene open-top tank secondary containment. Small-diameter corrugated HDPE drain piping coming from the secondary containments appeared to be in fair condition, and the in-line valves were open during the site visit. The tank piping to the feed pumps is exposed to the sunlight and did not appear to have secondary containment piping. A break to one of these pipes could result in the tank fully draining and spilling on the ground, creating environmental concerns. We recommend that CCU review the drain piping to ensure that Operations staff follow applicable regulations or add secondary containment piping (double-walled piping). The canopy that covered the storage tanks was blown off by Hurricane Ian. We recommend reinstalling this canopy with side walls to help protect the area from UV degradation and rainwater from filling the secondary containment bins that the tanks are set in.

Prominent Feed Pump No. 3 was replaced in FY 2018. Prominent Feed Pump No. 2 was replaced in FY 2019. Prominent Feed Pump No. 1 was replaced in FY 2021. The two total chlorine analyzers were replaced in FY 2019. The metal backplates for the chlorine analyzers have experienced substantial corrosion and staining and should be replaced. The chlorine feed line from the in-plant road was replaced in FY 2018.

6.4.4.7 Reuse, Disposal, and Storage

Reuse Facilities

Reclaimed water meeting public-access water quality is sent to the MRS using the HSPs at HSPS No. 1 and HSPS No. 2. HSPS No. 1 uses three vertical turbine pumps with VFDs to provide reclaimed water to golf course storage ponds north of the Rotonda WRF. The golf course's high-pressure pumps then increase pressure for irrigation system use. The motors for Pumps No. 1 and No. 3 failed and were replaced in FY 2022. These motors are only for temporary use since they are not rated for outdoor use. These indoor motors will continue to be used until outdoor motors can be acquired.

HSPS No. 2 contains two HSPs and one jockey pump that are primarily used to convey reclaimed water to golf courses south of the WRF. One of the two HSPs was replaced in

FY 2019. HSP No. 2 was rebuilt and replaced in FY 2021. The jockey pump was replaced in FY 2018. The HSPSs and aboveground piping were repainted in FY 2021.

Reclaimed water quality effluent can also be stored in the Rotonda WRF on-site 3.0-MG GST and unlined reclaimed water storage pond. The GST was drained and cleaned in FY 2017. Reclaimed water from the GST can be pumped to pressurized reuse customers using HSPS No. 2. The unlined reclaimed water storage pond has a reduced capacity due to groundwater percolation into the pond. The Chief Operator expressed that the unlined storage pond is not being used at this time or in the foreseeable future. Jones Edmunds recommends this pond be removed from the permit. It can then be filled with compacted suitable soil and replaced with a 3.0-MG GST. This is expected to be completed as part of the Rotonda WRF Upgrades to AWT project that is currently in the planning phase.

Effluent Disposal Facilities

As mentioned previously, the Rotonda WRF provides reclaimed water to the MRS. This allows for excess reclaimed-quality effluent to be sent to West Port's reclaimed water storage ponds or deep injection well (capacity 4.75 MGD) for final disposal. The Rotonda WRF also contains an on-site lined reject pond with a storage capacity of 5.182 MG. Water diverted to this pond does not meet reclaimed water standards and must be retreated through the WRF. A small pumping station pumps reject water back to the headworks.

Wet-Weather Storage

The on-site reclaimed water pond (2.64 MG), on-site GST (3.0 MG), and off-site Palms Pond (7.44 MG) are available for wet-weather storage of reclaimed water. The on-site reclaimed water pond is not currently in use.

6.4.4.8 Biosolids Handling Facilities

The overall condition of the solids-handling facilities is good. The decant mechanism for the sludge-holding tanks was designed as telescoping valves, but the telescoping valves can only be lowered to one-half the depth of the tank. Currently, decanting is done daily for 10 to 12 hours per day to attempt to maintain the holding tank capacity. The operators have replaced the designed method of decanting by using bottom-feed submersible pumps and a small winch on each pump to control the pump level.

The Chief Operator indicated that the plant is experiencing limited sludge-hauling capabilities, and excess sludge stored in the biosolids handling facilities has not exceeded system capacity. The pump-out station pumps and piping were replaced in FY 2023 by the CCU staff. Expanding the storage and dewatering at the biosolids handling facilities at East Port WRF is part of the ongoing 9.0-MGD expansion project to increase the receiving capacity from Rotonda WRF.

6.4.4.9 Electrical Components and Circuitry

The Rotonda WRF was inspected by a Jones Edmunds Electrical Engineer on February 28, 2024. Generally, the overall condition of the plant was good, although significant signs of deterioration are apparent in many systems. The incoming switchgear and distribution transformer appear in good condition. The plant is served from two 810-kW generators configured to operate in parallel. Our review of the electrical equipment in Building MCC-1 and the associated generator set revealed storm damage. This equipment is labeled with the appropriate NFPA 70E arc-flash warnings. Overall, the electrical equipment in Building MCC-2 is in good functioning condition based on information from Operations staff. This equipment is also labeled with the appropriate NFPA 70E arc-flash warnings.

The following deficiencies were noted:

- During the site visit, the audible alarm on generator set No. 2 was continuously sounding. Operations staff noted this fault alarm will not clear but does not prevent the generator from running. However, the Operations staff also noted that when both generator sets are running, the synchronizer is failing, which prevents both generator sets from working concurrently.
- Throughout many areas of the plant, conduits have become disconnected from their fittings and are now hanging loose with exposed wires, which is a code violation. Many of the conduit fittings are becoming badly deteriorated and rusted.
- Atop the headworks are two rotary drum screens. Old instrumentation/power connections are on the sides of each of them. Whatever was originally connected has been removed, but the conductors in the wiring were simply abandoned in place. Whether these were live conductors was not determined, but even if abandoned, they are considered to be a hazard unless identified as out of service or removed.
- The biosolids handling facility has a floating mixer that is being fed from flexible cordage. The mixer is currently operational and meets NEC; however, this cordage is wholly unsupported except for one small clip. This deficiency is a repeat listing from previous years.

- The blower assemblies use flexible conduit to provide power to the motor operated valves. This conduit is longer than 6 feet and is unsupported. This deficiency is a repeat listing from previous years.
- A light pole on site is broken and laying on its side, exposing wires to the environment.
- The MCC No. 2 exterior waterproof receptacle is missing its cover. Many other waterproof receptacles across the plant were also missing their covers, which is a code violation.
- The on-site lift station is reported to handle implant wastewater flows. The conduit traveling from the wetwell to the adjacent control panel does not contain conduit seal-offs, which is in violation of NEC since this is considered a classified area. When opening the control panel, a strong smell of sewer gasses is present, and the copper conductors and terminals have visible corrosion. This deficiency is a repeat listing from previous years.
- MCC Building No. 3 sustained Hurricane Ian damage such that interior lighting fixtures are hanging from wires – representing a significant hazard to staff (see photo above). This deficiency is a repeat listing from previous years.
- Several control boxes made of fiber-reinforced plastic are showing severe signs of UV damage.

6.4.5 Operations

The WRF consistently produces high-quality reclaimed water due to the use of MBR units; however, the treatment process is more energy intensive than conventional secondary treatment with filtration and requires a higher level of operator attention and understanding to balance flow and load through the MBR units. The Operations staff has done an excellent job maintaining the facility and the MBR membranes.

Plant Operators staff the Rotonda WRF 16 hours per day, 7 days per week. The WRF can be continuously monitored by the East Port WRF operators through a County-wide telemetry system that allows the Rotonda WRF to continue to produce reclaimed water 24 hours per day. The Wonderware SCADA software has been replaced with VTScada. Alarms are evaluated, and operators or maintenance staff can be dispatched to the Rotonda WRF to address issues, if necessary. Effluent not meeting reclaimed water standards is automatically diverted to the reject storage pond for retreatment.

6.4.6 Maintenance

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed in accordance with the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors.

6.4.7 Review of Previous Annual Report Recommendations

Table 6-16 presents the FY 2022 recommendations and their status for the Rotonda WRF.

Table 6-16 Rotonda WRF 2022 Recommendations and Status

Recommendation:	Evaluate different aeration systems for the reclaimed water storage pond.
Progress:	Not completed.
Recommendation:	Evaluate aquifer storage and recovery (ASR) for additional reclaimed water storage at the Rotonda WRF.
Progress:	A new deep injection well is planned as part of the Rotonda WRF expansion.
Recommendation:	Address previous recommendations for the headworks including influent valves, flow control, grit cyclones, and screens as part of the Headworks Improvement project.
Progress:	To be completed with the Headworks Improvement project.
Recommendation:	Add an MBR cassette to the trains as capacity needs dictate.
Progress:	Not completed.
Recommendation:	Add a galvanized metal frame and UV shade cloth to the CCCs.
Progress:	Completed before Hurricane Ian in September 2022, but the structure was damaged during the storm. CCU is evaluating replacement of the structure.
Recommendation:	Add a small winch to each decant pump in the sludge-holding tanks for better control of the pump level.
Progress:	Completed.
Recommendation:	Complete installation of the reclaimed water pipe to the Cape Haze Golf Course and the Placida Corridor.
Progress:	Completed.
Recommendation:	Add UV protection to the sides of the chlorine storage tanks to protect from direct sunlight.
Progress:	Not completed. Canopy was destroyed from Hurricane Ian.
Recommendation:	Integrate the MBR System into SCADA.
Progress:	Completed.
Recommendation:	A year before scheduled replacement, order membrane modules. Install new membrane modules in Train No. 1. Do not install new membrane modules with existing membrane modules in the same train. Move the existing membrane modules from Train No. 1 to Train No. 4. Train No. 4 will then have six membrane cassettes, which will extend the life of the membranes.
Progress:	Ongoing. CCU intends to replace membranes within the next 2 years.
Recommendation:	Purchase a few module blanks for top and bottom headers and wait to observe membrane effluent turbidity spikes, which would indicate that one of the cracked potting headers has breached the membrane integrity. Remove the compromised membrane module and install module blanks in its place until new purchased membrane module is received. Once the new membrane module is received, install the new membrane in the middle of the cassette and move an existing module where the compromised module was. This could prolong the new membrane module potting header life.
Progress:	Ongoing. This will be completed with membrane replacement.
Recommendation:	Complete electrical load study and arc-flash labeling.
Progress:	Completed.

Recommendation:	Replace damaged pump at the pump-out station for truck loading.
Progress:	Completed.
Recommendation:	Constantly monitor membrane permeability trend, especially for Trains No. 3 and No. 4.
Progress:	Ongoing.
Recommendation:	Continue monitoring and trending membrane permeability data and add temperature to the data collected weekly so that permeability can be corrected with the temperature to account for seasonal changes in water viscosity.
Progress:	Ongoing.
Recommendation:	Adjust the membrane slack as soon as possible.
Progress:	Ongoing.
Recommendation:	Continue to paint tanks, buildings, and pipes in the next 2 years.
Progress:	Ongoing.
Recommendation:	Replace Blower No. 5 with the correct lower scfm-capacity blower to lower oxygen levels and improve nitrogen removal.
Progress:	Operator states that this is not an issue; too little air is actually the problem.
Recommendation:	Add Headworks PLC to SCADA.
Progress:	Completed.
Recommendation:	Evaluate additional denitrification capacity.
Progress:	Will be incorporated as part of plant expansion project to meet AWT standards.
Recommendation:	Evaluate adding another EQ tank to respond to additional surges.
Progress:	Will be incorporated as part of plant expansion project.
Recommendation:	Add an MBR cassette to the existing trains as capacity needs dictate.
Progress:	Ongoing.
Recommendation:	Add a galvanized-metal frame and UV shade cloth to the CCCs.
Progress:	Ongoing.
Recommendation:	Complete repairs to Generator No. 2.
Progress:	Completed.
Recommendation:	Replace HSPS No. 1 motors with outdoor-rated motors to match HSPS No. 2.
Progress:	Operator states that both motors are outdoor rated.
Recommendation:	Replace the permeate pump to MBR No. 3.
Progress:	CCU WRF staff resolved the cavitation issue by replacing the injector valve in the MBR piping.
Recommendation:	Complete replacement of Blower No. 2.
Progress:	Not completed.

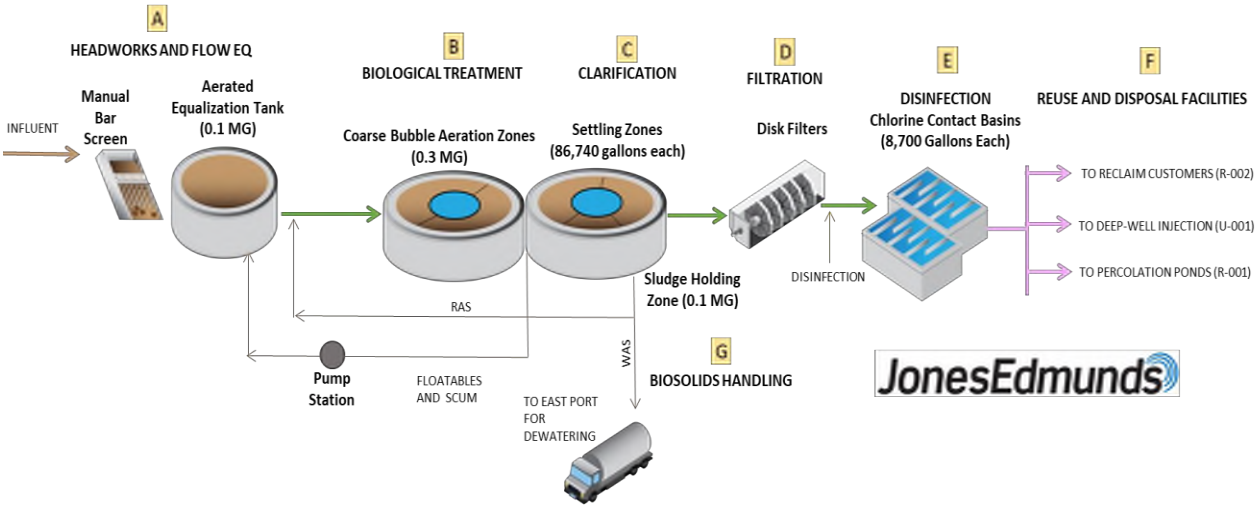
6.5 Burnt Store WRF

The Burnt Store WRF was acquired on December 12, 2003, when CCU purchased Florida Water Services' Burnt Store Division. Located in southwest Charlotte County on Burnt Store Road, the WRF serves south Charlotte County along Burnt Store Road and 2 square miles of

residential golf course/marina in Lee County. The WRF shares the site with the Burnt Store RO WTP.

The WRF uses conventional activated sludge with effluent filtration and high-level chlorine disinfection to produce reclaimed water. The facility's permitted capacity is 0.5-MGD AADF. Effluent can be distributed as reclaimed water to unrestricted-public-access reuse sites, injected into a deep well injection system, and applied to a slow-rate restricted-access land application system. The deep injection well system is shared with the adjacent Burnt Store RO WTP. Figure 6-5 shows the Burnt Store WRF process flow diagram.

Figure 6-5 Burnt Store WRF Process Flow Diagram



The Burnt Store WRF process consists of the following components:

A) Headworks and Flow EQ: Raw wastewater from the South County service area collection/transmission system enters the WRF manual bar screen and flows into the EQ tank. Blowers equipped with timers and coarse-bubble diffusers aerate the wastewater and suspend solids. Internal plant flows from the on-site pump station are also pumped into the EQ tank.

   The EQ transfer pumps are equipped with VFDs that operators periodically adjust based on season and historical trends. The EQ tank is equipped with ultra-sonic level sensors that turn off the pumps based on a low level and trigger an alarm condition if the EQ tank level gets above the high-level alarm.

B) Biological Treatment: The activated-sludge treatment occurs in two steel-ring package treatment units. The wastewater from the EQ tank enters the outer ring of a package-type treatment basin equipped with coarse-bubble diffusers where it is combined with RAS flow from the settlers. The MLSS are aerated to achieve extended aeration

treatment, and the air-flow rate of the diffusers is adjusted to achieve Nitrogen removal.

The plant has three Gardner Denver centrifugal blowers: one dedicated to the aeration tanks, one dedicated to the sludge digestion tank, and one on stand-by. A fourth smaller blower provides air to the EQ tank.

C) Clarification: The two-steel circular secondary clarifiers are within the center of each package treatment unit for gravity solids separation. The clarifiers are skimmed to remove floatables and scum before clarifier effluent flows over a circumferential weir to the tertiary filters.

Sludge pumps convey settled solids to the RAS or the WAS. The RAS pumps turn on 10 minutes before and turn off 10 minutes after the EQ pumps turn on and turn off. Scum is collected in a scum trough and sent to the plant lift station where it is returned to the EQ tank.

D) Filtration: Clarified water from the settlers enters four disk filters, each having 5-micron filter cloths. The disk filter unit is installed in a steel filter tank that allows water to flow from outside the disk filters into a manifold system of the filter unit.

E) Disinfection: The filtered water can be sent to two CCCs where liquid sodium hypochlorite is introduced for disinfection. Two chemical feed pumps are controlled by a chlorine analyzer to dose sodium hypochlorite. A mixing pump is provided at the chemical feed point, and the chambers are baffled and sized to meet disinfection requirements. The chlorine analyzer measures chlorine concentration at the beginning of the CCC and adjusts the chlorine feed rates. A reagent-less analyzer measures the chlorine residual at the CCC discharge weir for compliance with regulatory limits. Sodium hypochlorite is stored in two tanks with a total capacity of 2,200 gallons.

F) Reuse and Disposal: Effluent water meeting reclaimed water standards is conveyed through the unrestricted-public-access reclaimed water system via a HSP station. The HSP station consists of two large HSPs and two smaller jockey pumps. Effluent water not meeting reclaimed water standards is conveyed to two Class I deep injection wells, and four percolation ponds are available for disposal of excess reclaimed water or treated water that does not meet reclaimed water standards.

IW-2 is currently being used as the primary means of effluent disposal, with the older well, IW-1, maintained as a backup. Currently, a maximum of 380 gpm can be diverted to the deep well. Effluent flow that exceeds the deep well flow setpoint is diverted to the percolation pond system by way of a splitter mechanism at the CCC. The deep injection wells are also used for disposal of concentrate from the Burnt Store WTP RO facilities. Flows from the WTP and WRF are combined in a wetwell at the injection well pumping station. Two equally sized vertical turbine pumps are used to inject water into the injection well.

G) Biosolids Handling: Three crescent-shaped sludge-holding tanks are in one steel ring tank, providing a total capacity of nearly 300,000 gallons. Sludge is hauled to the East Port WRF and combined with the sludge from the other Charlotte County WRFs for

digestion, dewatering, and final disposal at the compost facility at the County's Zemel Road Landfill. One blower is dedicated to the sludge-holding/aerobic digestion tank.

6.5.1 Regulatory Considerations

The Burnt Store WRF operations are regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Plant Operating Permit (FLA014083) – Expiration Date: December 28, 2026.
- IW-1 Permit (0271367-007-UO/1I) – Expiration Date: May 14, 2024.
  - The last MIT was performed on IW-1 on June 5, 2020. The next MIT is due by June 4, 2025.
  - A permit renewal was submitted January 26, 2024, and is pending approval by FDEP (application number 0271367-009-UO).
- IW-2 Permit (0271367-008-UO/1X) – Expiration Date: August 22, 2027.
  - The last MIT was performed on IW-2 on May 31, 2018, and the next MIT is due by May 30, 2023.
  - A renewal MIT plan was submitted and approved by the Department on September 13, 2022; the MIT was completed on April 7, 2023.

6.5.2 Wastewater Flows and Loads

The Burnt Store WRF's permitted capacity is 0.500-MGD AADF. In FY 2023, the AADF was 0.31 MGD, and the Burnt Store WRF is operating at 62 percent of the plant permit capacity. The MADF occurred in September 2023 at 0.81 MGD. The maximum TMADF of 0.41 MGD occurred in October 2022, which is 82 percent of the plant permit capacity. Table 6-17 summarizes influent flows as reported on the FY 2023 DMRs.

Table 6-17 Burnt Store WRF Influent Flows in FY 2023

Month	MADF (MGD)	AADF (MGD)[1]	TMADF (MGD)	MDF (MGD)	TMADF Percent Capacity (%)
Oct-22	0.31	0.33	0.41	0.45	81
Nov-22	0.38	0.33	0.40	0.63	79
Dec-22	0.32	0.34	0.33	0.36	67
Jan-23	0.34	0.34	0.34	0.53	69
Feb-23	0.35	0.34	0.34	0.41	67
Mar-23	0.34	0.34	0.34	0.38	69
Apr-23	0.34	0.35	0.34	0.52	69
May-23	0.25	0.35	0.31	0.36	62
Jun-23	0.22	0.34	0.27	0.31	54
Jul-23	0.24	0.33	0.24	0.45	47
Aug-23	0.28	0.32	0.25	0.67	49
Sep-23	0.37	0.31	0.29	0.81	59

Note: [1] Permitted plant capacity 0.500 MGD; measured at monitoring site FLW-01.

As the data show, the Burnt Store WRF has reached a percent-of-capacity use that requires a capacity analysis report (CAR) every year to assess the previous year flows and their impact on the capabilities of the plant to meet its permitted effluent requirements. Historically, WRF flows were consistent, but a substantial population growth has been observed in this area in recent years. CCU is in the design phase for the expansion of this WRF, which will increase the capacity of the Burnt Store WRF plant through a phased approach to meet projected needs.

For FY 2023, the average annual influent load for BOD was 339 lb/day and for TSS was 407 lb/day. The maximum monthly average BOD load was 568 lb/day, occurring in March 2023. The maximum monthly average TSS load was 558 lb/day in November 2022, which corresponds with seasonal residents and the dry season. Table 6-18 summarizes the wastewater characteristics of the WRF influent.

Table 6-18 Burnt Store WRF Influent Water Quality in FY 2023

Month	BOD		TSS	
	Monthly Avg. Concentration[1] (mg/L)	Monthly Avg. Load (lb/day)	Monthly Avg. Concentration[1] (mg/L)	Monthly Avg. Load (lb/day)
Oct-22	127	303	119	294
Nov-22	118	350	133	558
Dec-22	139	386	147	409
Jan-23	170	470	185	514
Feb-23	163	516	180	527
Mar-23	206	568	200	551
Apr-23	167	466	166	504
May-23	125	265	138	295
Jun-23	122	185	206	319
Jul-23	92	185	137	413
Aug-23	76	166	116	236
Sep-23	80	204	103	267

Note: [1] Measured at monitoring site INF-01.

6.5.3 WRF Treatment Objectives and Effluent Quality

The Burnt Store WRF is designed to treat wastewater to three effluent standards: one for disposal to the deep injection wells (U-001), one for the percolation pond systems (R-001) which requires basic disinfection and contains a nitrate limit, and one for public-access reuse (R-002) which requires high-level disinfection. Table 6-19 lists the flow and primary water quality requirements for each effluent reuse and disposal method.

Table 6-19 Burnt Store WRF Effluent Requirements

Reuse/Disposal Method	R-001	R-002	U-001
Max Flow (MGD)	0.25[a]	2.2603[a]	3.444[d]
Max BOD (mg/L)	20[a]/30[b]/45[c]/60[d]	20[a]/30[b]/ 45[c]/60[d]	20[a]/30[b]/45[c]/60[d]
Max TSS (mg/L)	20[a]/30[b]/45[c]/60[d]	5[d]	20[a]/30[b]/ 45[c]/60[d]
Total Fecal (#/mL)	200[a]/200[e]/800[d]	25[d]	Not Applicable

Notes: Statistical bases: [a]annual average; [b]monthly average; [c]weekly average; [d]single sample; [e]monthly geometric mean.

Table 6-20 summarizes the effluent flow and water quality of the Burnt Store WRF. In FY 2023, the annual average effluent flow for the percolation ponds (R-001) and reuse system (R-002) were 0.23 MGD and 0.02 MGD, respectively. The MDF of the well (U-001) was 0.85 MGD, indicating that the WRF is meeting its effluent flow requirements. The maximum single-sample BOD and TSS values were 2.0 mg/L and 5.7 mg/L, respectively. The maximum single sample TSS limit is 5 mg/L, indicating a permit violation. A clarifier overflow due to a mechanical malfunction was reported to FDEP 3 days earlier; the increased TSS concentration may be a result of this incident. No other single samples exceeded 5 mg/L. Therefore, no violations of the single-sample limits for BOD or TSS were recorded in FY 2023. Consequently, the BOD and TSS annual average, monthly, and weekly concentration requirements were also met in FY 2023. The maximum fecal coliform counts rarely exceeded 1/100mL and were well within public-access reuse standards. The plant experienced an unusually high fecal coliform samples in December 2022 and September 2023.

Table 6-20 Burnt Store WRF Effluent Flow and Water Quality

Month	Reuse and Disposal Method			Water Quality		
	R-001 Monthly Avg. Flow[1] (MGD)	R-002 Monthly Avg. Flow[2] (MGD)	U-001 Maximum Day Flow[3] (MGD)	Maximum BOD Conc.[4] (mg/L)	Maximum TSS Conc.[5] (mg/L)	Maximum Fecal Count[5] (#/100mL)
Oct-22	0.07	0.014	0.40	2.0	0.4	<1
Nov-22	0.08	0.021	0.85	2.0	2.3	<1
Dec-22	0.08	0.027	0.41	2.0	0.4	727
Jan-23	0.15	0.027	0.40	2.0	0.4	<1
Feb-23	0.15	0.025	0.78	2.0	5.7	<1
Mar-23	0.18	0.022	0.37	2.0	0.4	<1
Apr-23	0.34	0.025	0.39	2.0	0.4	<1
May-23	0.25	0.018	0.33	2.0	0.4	<1
Jun-23	0.33	0.019	0.01	2.0	1.7	<1
Jul-23	0.30	0.022	0.34	2.0	0.4	<1
Aug-23	0.36	0.009	0.26	2.0	0.4	<1
Sep-23	0.48	0.005	0.01	2.0	0.4	2,420

Notes: [1] Monitoring site OTH-01; [2] Monitoring site OTH-02; [3] Monitoring site OTH-03; [4] Monitoring site EFA-01; [5] Monitoring sites EFA-01 and EFA-02.

6.5.4 Treatment Components and Condition Assessments

Jones Edmunds completed an on-site review of the plant on January 25, 2024. Our personnel met with Gerry Mills, Chief Operator of the Burnt Store WRF, to review plant conditions and operations and discuss records. Usually, access to the facility is through a secure gate in a fence that surrounds the water and wastewater plants. At the time of the conditions assessment, the gate mechanism that was damaged by Hurricane Ian could not be opened or closed remotely, so it was left open throughout the day. The plant site is well kept and maintained including mowing and storage of used equipment in suitable locations.

Required documents maintained on site include:

- Operating permits for the treatment facility and deep injection well.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- DMRs.
- Effluent Analysis Reports.
- Annual Reuse Report.
- Pathogen Monitoring Report (Giardia and Cryptosporidium every 5 years per permit).
- Reports required to complete the last permit application.
- Certification of the EPLAB.
- Sampling Plan.
- Groundwater Monitoring Plan (contained in permit).
- Laboratory results.
- Flow meter calibrations.
- Chlorine and pH meter calibrations (one/day).
- Chain-of-custody forms for samples that are sent to laboratories.
- Monthly residual and marketing report (reported in dry tons/month).
- Facility Operations and Maintenance Manuals.
- Maintenance records (EAMS electronic data system).
- Reuse Operating Protocol.
- Facility Record Drawings.
- Daily temperature logs.
- Spill protocol and record of spills.

6.5.4.1 WRF Influent Sampling Location

The influent water quality sampling location (INF-01) is clearly marked, and the refrigerated influent composite sampler has recently been repaired and is in operating condition. The influent flow monitoring location (FLW-01) is clearly marked, and the flow meter is in good operating condition.

6.5.4.2 Headworks

The headworks' overall condition is poor. It consists of one manually cleaned bar rack. The headworks does not include grit removal, and the influent manual-screening system cannot prevent fine debris and grit from entering the facility's EQ tank, pumping systems, and process tanks. Currently, the only way to remove floatables that pass through the manual bar screen is by using a bucket to remove them from the EQ tank.

The lack of fine screening and grit removal creates operational and mechanical problems for the EQ tank and pumps. Staff clears the EQ transfer pumps weekly during the peak season and biweekly during the off-peak season. The staff also clears the pipelines of debris annually to remove clogs in the system.

6.5.4.3 Flow Equalization

The Aquastore EQ tank is in poor condition. The EQ tank has signs of rust around the upper steel rim, which likely originates from the RO WTP waste line. Internal piping is in poor condition with leaks at flanged fittings, and one of the drop diffusers inside the EQ tank has been damaged and is no longer secure. Since no grit-removal facilities are provided, grit accumulation occurs in the EQ tank and reduces treatment capacity. The grit accumulation is currently being managed by having a vendor periodically pump out the grit in the EQ tank while in operation.

The EQ tank can transfer flow to the treatment process train by gravity (gravity mode) and/or pumped using the EQ transfer pump station. The gravity mode allows diurnal loads to be equalized using the entire tank volume. The gravity mode uses a splitter box with gravity flow piping to split flow between the two activated-sludge treatment basins. However, the capacity of the gravity piping is too small to pass the maximum daily flows. As such, Operations staff pump the raw wastewater from the EQ tank to the two aeration basins. The equalization pumps and motors were replaced in January 2021. The system is capable of pumping 400 gpm with one pump running at a time. The pumps send water to the splitter box, and the raw effluent runs by gravity to the aeration basin. The flow does not reach a 2-foot-per-second velocity, and the operators have experienced issues with the 12-inch feed pipes clogging. The Chief Operator noted that EQ Pump No. 2 cannot be removed for maintenance because it is fused to the volute. However, a new motor for Pump No. 2 is planned for replacement soon. The Chief Operator also noted past issues with the VFD for Pump No. 1. The VFD was repaired and is now functional.

Construction of the Burnt Store WRF expansion, which is projected to be completed by 2026, will include new headworks.

6.5.4.4 Biological Treatment

The activated-sludge facilities are steel-ring package plants consisting of two aeration tanks and two clarifiers. At the time of the site visit, the aeration basins appeared to have adequate and even air distribution throughout the tank. All blowers were rebuilt in 2017, and new VFDs were provided for two of the blowers in 2022. Motor repairs for Blower No. 1 were completed in 2023. The Chief Operator noted that the blowers are undersized for the volume of wastewater that the plant has been experiencing recently. Additionally, the pressure gauges for the blowers were not working at the time of the site visit. The operation of the blowers is based on timers, but no DO sensors are provided to adjust blower operation. The hinged sluice gates separating the two aeration tanks are not functioning as intended, allowing wastewater to flow to the adjacent tank during maintenance. The tanks have minimum

free-board (<1 foot), creating concerns of overflowing during high-flow conditions or if a downstream flow obstruction occurs. CCU staff reported that the tank has since been successfully repaired by staff with assistance from a certified diver. The repairs included installing steel cables to adjust the sluice gates.

6.5.4.5 Clarification

The clarifier portions of the tanks appear to be functioning, although solids were observed near the surface; Clarifier No. 1 appeared to be performing less adequately than Clarifier No. 2 based on water flow and additional solids observed at the surface. The scum troughs were observed to be worn down and need replacing. The Chief Operator noted that Clarifier No. 2 typically treats approximately 60 percent of the plant flow. Notable algae growth was observed on the weirs. A significant amount of floatables passes through the headworks and collects in the clarifiers. The floatables are returned to the headworks and accumulate in the WRF until they are manually removed. The two RAS/WAS pumps that draw solids from the bottom of the tanks are in poor condition and operating at their end of lifetime. RAS Pump No. 1 was replaced in 2023. The pipe pumping design makes it difficult for operators to de-rag the pumps. The Chief Operator noted that some electrical repairs would be needed due to lights and outlets not working. The County continues to maintain and repair these systems until the WRF expansion is completed.

Overall, the tanks appear to be in good condition and were recently painted. Additionally, a white rock and shell aggregate was being installed around the tanks, adding to the plant aesthetics.

6.5.4.6 Filtration

The effluent filtration system is a cloth-media disk filter with 5-micron cloths, housed in a painted carbon-steel tank and controlled by a series of backwash actuators. The Chief Operator noted that cloth media replacement is required. The cloth filters are very similar to those currently installed at the West Port WRF. The backwash actuators were replaced in 2019 and are in excellent condition. The operator indicated that the filter is producing a good-quality effluent but backwashes frequently during periods of high flow, which can cause overflows to the CCC. The WRF expansion project includes new filtration.

6.5.4.7 Disinfection and Effluent Sampling Station

The overall condition of the chlorination system is good. The concrete CCCs are in good condition. During the site visit, a staff member was actively cleaning one of the chambers that was out of service for maintenance. The UV cover that had previously been installed on CCC No. 1 is no longer in service. A submersible mixing pump is used to enhance chlorine mixing. A sampling pump is used to pump CCC effluent to the chlorine analyzer for compliance monitoring, which replaced an old gravity-fed system and improved reliability.

The two sodium hypochlorite tanks are well kept and meeting regulatory requirements. An emergency eyewash and shower are at the sodium hypochlorite storage tank and chemical

feed pump area. A concrete containment wall has been constructed around the entire chlorine storage and pumping area. Two new Prominent diaphragm chlorine metering pumps were installed in FY 2023. However, the capacity of the pumps was notably undersized at 2 gallons per hour (gph) and will soon be replaced with 11-gph pumps. The effluent monitoring locations (EFA-01 and EFA-02) are clearly marked. The refrigerated effluent composite sampler was reported to have experienced repairs recently but is now in functioning condition.

6.5.4.8 Reuse, Disposal, and Storage

As mentioned previously, the Burnt Store WRF has three permitted effluent reuse and disposal options including public-access reuse (R-002), deep injection well (UIC), and a percolation pond system (R-001). Effluent meeting reclaimed water standards is conveyed to the reclaimed water customers within the Burnt Store WRF service area if the demand is present. If the effluent does not meet reclaimed water standards or the demand is not present in the reuse system, the effluent is conveyed to the deep injection well or percolation ponds.

Reuse Facilities

The Burnt Store WRF reuse facilities include a reclaimed water pump station and clearwell, which are in overall good condition. The reclaimed water pump station is above the clearwell following the CCCs. Two HSPs and two booster pumps are used to convey up to 0.5 MGD AADF of reclaimed water to customers. The booster pumps are currently used to satisfy demand in the reuse system, but the two large HSPs are working properly and are tested regularly. The reclaimed water HSPs and jockey pumps are well maintained and show no signs of deterioration. Flow to the reclaimed water pump station is monitored by an ultrasonic flow meter and primary weir device, which became obsolete when the WRF began transferring flow to the deep injection well system. A new flow meter is needed to monitor the pump discharge line and measure reclaimed water flow. In addition, no on-site reclaimed water storage is available, which will require future major reclaimed water users to be served through direct distribution to the user's reclaimed water holding facility or require storage to be added on site. These limitations will be addressed in the design of the Burnt Store WRF expansion project. Chapter 7 provides additional information about the Burnt Store Reuse System.

Effluent Disposal Facilities

The Burnt Store WRF also has two alternate options for disposing of excess reclaimed water or effluent not meeting reclaimed water standards including two injection wells (IW-1 and IW-2) and four on-site percolation reuse ponds. IW-1 has a rated capacity of 0.564 MGD. IW-2 is designed for an ultimate capacity of 9.5 MGD. However, due to hydraulic and supply limitations associated with available test water, IW-2 was tested at a flow rate of 2.88 MGD. Thus, the initial capacity rating for IW-2 is 2.88 MGD.

The deep injection wells are well maintained and in good working order, but some improvements and flow limitations have been noted on the system. The improvements include the replacement of an IW pump in 2018 and a 16-inch valve on the IW-2 inlet line in FY 2019. The deep well pumping station is limited to 380 gpm since the effluent flows by gravity to the wetwell through a 6-inch-diameter pipe, which is insufficient to move peak flows. Flow that does not reach the deep well overflows to the percolation ponds. This situation impacts the WRF's ability to handle peak flows and limits the capacity of the deep wells.

Operations personnel exercise IW-1 once per month for a minimum of 24 hours to maintain its integrity. Four shallow monitoring wells around the IW-1 deep injection well were installed as part of the injection well construction. These wells should not be plugged because they may be needed if any rehabilitation work is performed on IW-1 or IW-2.

Table 6-21 lists the average flow pumped into IW-1 and IW-2 and the total monthly volumes sent to the deep wells and percolation ponds. As the data show, the wells are well within their rated capacities, and IW-2 is the primary well used for disposal. In FY 2023, a total volume of approximately 59.22 MG was sent to the deep injection wells and 84.37 MG were sent to the percolation ponds.

Table 6-21 Burnt Store WRF Average and Total Injection Well Flows

Month	Average IW Flow (MGD)	Total IW Volume (MG)	Total Pond Volume (MG)
Oct-22	0.286	8.85	2.21
Nov-22	0.366	10.98	2.31
Dec-22	0.295	9.15	2.52
Jan-23	0.256	7.92	4.68
Feb-23	0.269	7.54	4.31
Mar-23	0.241	7.48	5.51
Apr-23	0.094	2.83	10.15
May-23	0.067	2.09	7.75
Jun-23	0.003	0.08	9.92
Jul-23	0.041	1.27	9.40
Aug-23	0.028	0.86	11.30
Sep-23	0.006	0.17	14.32
Annual Avg	0.163	—	—
Annual Total	**—**	**59.22**	**84.37**

Note: The Burnt Store WRF IWs also receive the concentrate flows from the Burnt Store RO WTP.

The percolation ponds are used to their maximum permitted capacity to encourage shallow groundwater recharge. The percolation ponds are alternately rested and allowed to dry. The pond bottoms are harrowed to enhance percolation. The interior of the ponds above the water line are mowed. Limitations have been reported in the percolation ponds that have been attributed to the high groundwater conditions in the area.

As part of the WRF upgrades, CCU intends to evaluate other means for transferring greater amounts of effluent flow to the deep well, such as increasing the size of the piping and investigating the need for additional storage, additional filtration, and other redundancies to comply with the corresponding regulations.

Wet-Weather Storage

The on-site percolation ponds are available for limited wet-weather storage of reclaimed water at the Burnt Store WRF.

6.5.4.9 Biosolids Handling

The overall condition of the biosolids-handling facilities is good. Two tanks are aerated to provide partial sludge stabilization, and the third tank is normally used for thickening and decanting. Hook-up connections are provided for trucks to transport thickened sludge to the East Port WRF for further processing. A bottom-feed submersible pump suspended on a winch is used to decant supernatant back to the front end of the facility for treatment.

6.5.4.10 Electrical Components and Circuitry

The incoming switchgear and distribution transformer appear in fair-to-good condition. The incoming power company service transformer exhibits an extensive amount of surface rust, which may soon be impacting the transformer function. The existing primary distribution switchboard outside the MCC room is also exhibiting signs of degradation from the weather. The plant is served from a single generator of an undetermined size, and its water pump was replaced in FY 2022. The generator was in good condition but exhibited signs of residual diesel fuel on top of the diesel fuel tank. This may be indicative of additional issues. Overall, the electrical equipment in Building MCC-1 is in good functioning condition based on information from the Operations staff, except for the deficiencies listed below.

The following deficiencies were noted:

- The switchgear contains warning labels identifying parts and components as being energized. However, none of the equipment includes the appropriate arc-flash labeling required by NFPA 70E.
- The fiberglass MCC building should be replaced with a concrete structure.
- The main breaker trips when two blowers are started simultaneously.
- The generator is undersized and is not capable of supporting all blowers at one time.

6.5.5 OPERATIONS

The Burnt Store WRF is continuously monitored by online instrumentation through SCADA. A new Operations Building, which is shared with the Burnt Store RO WTP staff, was completed in FY 2009. The Operations Building houses the WRF operating system, which is used to monitor critical operations and maintain compliance with regulatory requirements. The Operations Building also now houses the monitoring for the security cameras, which the Chief Operator noted was recently moved from the laboratory.

Plant Operations staff manages the treatment process effectively and works to address maintenance items in a timely manner. The plant produces effluent meeting the requirements

for reclaimed water and injection well disposal. The flow EQ tank helps attenuate diurnal and extreme weather flows to enable proper treatment.

The Burnt Store WRF is staffed 8 hours per day, 7 days per week. The WRF can be continuously monitored by the East Port WRF operators through a County-wide telemetry system that allows the Burnt Store WRF to continue to produce reclaimed water 24 hours per day.

6.5.6 MAINTENANCE

Routine maintenance is performed on a scheduled basis. Rehabilitation of major pieces of equipment is completed according to the CIPs that are revised annually. Maintenance that is required to keep the WRF in compliance with regulations is performed immediately using in-house maintenance personnel or outside contractors. The entire facility was scheduled to be repainted in FY 2018. Painting of the facility was completed in FY 2019.

6.5.7 REVIEW OF PREVIOUS REPORT RECOMMENDATIONS

Table 6-17 presents the FY 2022 recommendations and their status for the Burnt Store WRF.

Table 6-22 Burnt Store WRF FY 2022 Recommendations and Status

Recommendation:	Perform maintenance and equipment replacement as necessary until the WRF expansion can be completed.
Progress:	Ongoing.
Recommendation:	Complete MIT for IW-1.
Progress:	Completed.
Recommendation:	Evaluate the existing generator performance to determine limitations that may occur before constructing the plant expansion, which will include a new generator.
Progress:	Ongoing.
Recommendation:	Perform maintenance and equipment replacement as necessary until the WRF expansion is completed.
Progress:	Ongoing
Recommendation:	Investigate the high frequency of replacing chemical feed pumps. Consider using a different manufacturer and/or equipment model.
Progress:	In progress.
Recommendation:	Complete motor repairs for Blower No. 1 and place back in service.
Progress:	Completed.
Recommendation:	Repair front access gate from hurricane-related damage and fully establish security.
Progress:	Not completed.
Recommendation:	Continue to evaluate and repair composite sampling units as necessary.
Progress:	Ongoing.
Recommendation:	Evaluate replacement of EQ tank Pump No. 2 due to fused volute and lack of maintenance access.
Progress:	In progress.

6.6 Wastewater Biosolids Transport, Processing, and Disposal

Partially digested biosolids from CCU's four WRFs are processed at the East Port WRF biosolids management and processing facility. CCU owns two 6,000-gallon tankers for biosolids transportation from the West Port, Rotonda, and Burnt Store WRFs. The biosolids are discharged into a 2.05-MG aerated-sludge holding tank for partial stabilization and decant thickening before dewatering. Biosolids dewatering is accomplished by two Ashbrook 2-meter-wide BFPs near the holding tank. The biosolids are dewatered to approximately 17-percent solids and hauled in County-owned 35-cubic yard dump trailers to the Synagro compost facility at the Charlotte County Zemel Road Landfill. The dewatered biosolids are mixed with chipped yard waste, composted to Class A standards, and distributed and marketed for organic amendment for sandy soil enhancement and material for landfill final cover.

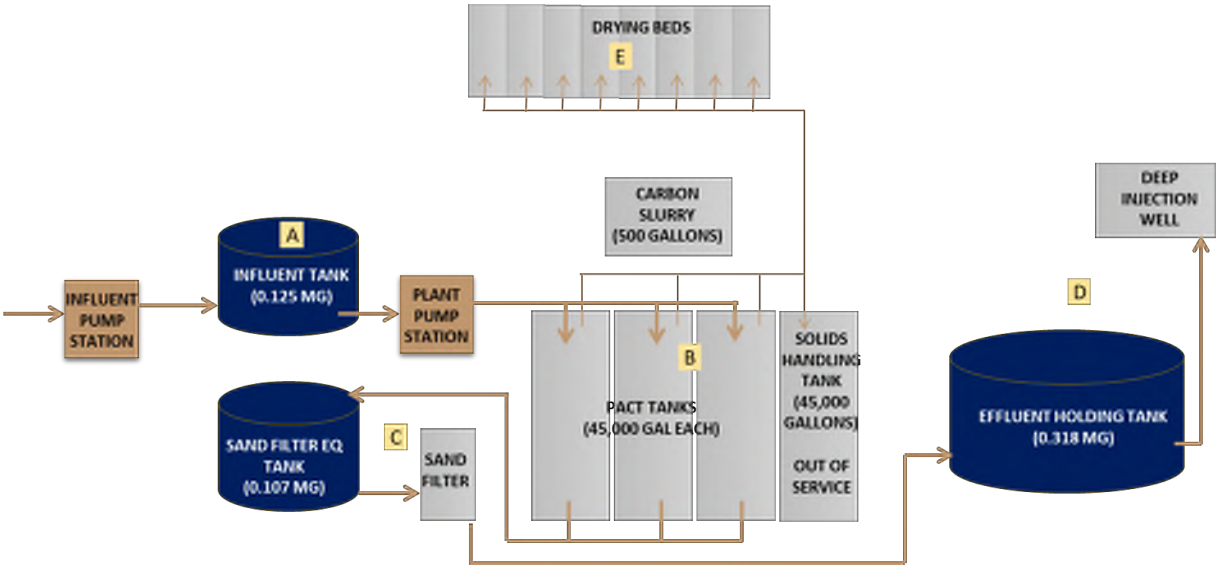
6.7 Leachate Treatment Facility

The Zemel Road LTF is operated and maintained by CCU for the Charlotte County Municipal Solid Waste Management Department. Leachate generated by the Zemel Road Municipal Solid Waste Landfill is treated at the LTF and disposed of on site. The treatment facility and landfill share a 308-acre parcel in South County at 29751 Zemel Road, Punta Gorda, Florida 33955.

The landfill is designed to contain and collect leachate to protect surrounding groundwater and lakes. Leachate is generated as water seeps down through the solid waste, picking up dissolved and suspended solids. A vertical bentonite (clay soil) slurry wall that blends below ground with the natural confining layer of soil surrounding the landfill separates the interior landfill leachate from the natural environment. A leachate collection system installed under the waste drains the liquid to a central location where it is pumped to the LTF.

Figure 6-6 shows the LTF process flow diagram.

Figure 6-6 Zemel Road LTF Process Flow Diagram



The Zemel Road LTF consists of the following components:

A) Influent: Most of the LTF influent originates from the landfill collection system and is conveyed to the LTF through the landfill pump station (PS-1). The landfill leachate is combined with the plant office sanitary sewer, landfill underdrain flows, and runoff from the composting operation. The flows are conveyed through the influent flow meter and enter a steel circular influent-holding tank. The plant pumping station (PS-2) transfers leachate from the influent holding tank to the powder-activated carbon treatment (PACT) system.

B) PACT Treatment: The batch reactor PACT system consists of three separate tanks using aerated activated sludge with carbon particle adsorption. Each PACT tank is a small package plant with separate PAC feed and aeration systems. PAC is mixed with water to form a carbon slurry before combining with the raw leachate. The solution is then aerated to promote aerobic digestion and is followed by a sludge-settling period.

C) Filtration: After settling is completed, the decant water is pumped to the filter feed tank and gravity fed through a sand filter for final polishing. The filter effluent is conveyed to a glass-lined steel effluent storage tank.

D) Effluent Disposal: The LTF effluent is conveyed from the effluent storage tank to a deep injection well and disposed of in a confined saltwater aquifer at an approximate depth of 2,700 feet below ground surface. The effluent sample point at the deep injection well may be seen in the photo provided.

E) Solids Disposal: After decanting the treated leachate, a portion of the solids (mixed carbon/biological sludge) from the PACT tanks are conveyed to the outdoor sludge-drying beds for dewatering. Once dry, the solids are conveyed to a dumpster and hauled to the landfill for final disposal.

6.7.1 Regulatory Considerations

The Zemel Road LTF is regulated by FDEP under the provisions of Chapter 403, Florida Statutes, and the applicable FAC rules. The following permits govern plant operations:

- Class 1 Landfill Permit – Expiration Date: July 15, 2033.
- IW-I and MW-1 Permit (No. 191077-004-UO/1I) – Expiration Date: October 25, 2024 (Permit renewal by Charlotte County Public Works):
  - Monthly Summary Reports submitted to FDEP.
  - Quarterly Specific Injectivity Tests completed and submitted to FDEP.
  - The most recent MIT was performed in March 2022.

6.7.2 Leachate Flows

The LTF's construction permit was issued in 1991 as part of the Class I landfill to treat 0.25 MGD of leachate. The current UIC permit specifies a maximum wellhead pressure of 39 psi, a peak flow rate of 320 gpm, and a maximum injection volume of 0.46 MGD. Table 6-23 summarizes the flows sent from the LTF to the deep injection well. No operation or injection took place in October and November 2022 because a tank was down for cleaning and repairs. In FY 2023, the maximum wellhead pressure, peak flow rate, and maximum daily injection volume were within permit limits, and the LTF treated a total of 17.27 MG.

Table 6-23 LTF Deep Injection Well Flows – FY 2023

Month	Maximum Wellhead Pressure (psi)	Peak Injection Rate (gpm)	Maximum Injection Volume	Total Monthly Flow (MG)
Oct-22	19.0	0	0	0
Nov-22	19.0	0	0	0
Dec-22	24.0	214	0.24	1.55
Jan-23	23.2	261	0.10	2.16
Feb-23	23.0	199	0.10	1.70
Mar-23	24.0	212	0.09	1.27
Apr-23	24.0	214	0.15	2.12
May-23	25.0	223	0.09	1.82
Jun-23	26.0	246	0.12	1.80
Jul-23	27.0	202	0.10	1.64
Aug-23	28.0	219	0.11	1.74
Sep-23	28.0	228	0.14	1.47

6.7.3 Treatment Objectives and Effluent Quality

The LTF uses a PACT batch tank treatment system, which combines PAC and activated sludge (aerobic bacteria) to simultaneously adsorb and metabolize the leachate contaminants to treat the leachate to an acceptable level for deep well injection disposal. The treated leachate is sampled daily for pH, weekly for fecal coliform, TSS, and total alkalinity and monthly for TOC, TDS, BOD, COD, TN, TKN, nitrate, lead, and chlorides. In addition, treated leachate is sampled

and analyzed for the Primary and Secondary Drinking Water parameters semiannually. Table 6-24 summarizes the LTF effluent quality goals before disposal of the treated leachate.

Table 6-24 Effluent Quality Goals

Parameter	Effluent Quality Goal
pH	6.0–9.5 s.u.
TSS	20 mg/L
BOD	20 mg/L
COD	Acceptable BOD/COD ratio

A program to operate the Zemel Road Landfill as a landfill bioreactor and recycle leachate to enhance landfill biogas production at the landfill has changed influent leachate flows and characteristics over the years. However, the effluent leachate still meets acceptable final effluent standards for disposal to the 0.46-MGD deep injection well system adjacent to the treatment plant.

6.7.4 Treatment Components and Condition Assessments

Jones Edmunds conducted a site visit of the LTF on January 25, 2024, and met with Tim Bracke, Chief Operator, to review plant conditions, operations, and records. Access to the facility is through a secure gate at the entrance to the landfill. The plant is isolated among landfill operation buildings and adjacent to the yard waste composting facility. The facility appears in good condition and staff does a good job maintaining the grounds and the facility appearance.

The facility is required to maintain plant documents on site. The following summarizes the types of documents generally found at treatment plants. Due to the nature of this facility and since it is permitted under the landfill permit, some traditional documents may not be required for the LTF:

- Operating permit for the deep injection well.
- Operators' licenses.
- Facility logbook.
- Facility Standard and Emergency Operating Plans.
- MORs.
- Effluent Analysis Reports (N/A).
- Reports required to complete the last permit application.
- Certification of the laboratory used for sample analysis.
- Sampling Plan.
- Groundwater Monitoring Plan (N/A).
- Laboratory results.
- Chain-of-custody forms for samples that are sent to laboratories.
- Facility O&M Manuals.
- Maintenance records (EAMS electronic data system).
- Facility Record Drawings.
- Spill protocol and record of spills are kept by the owner of the plant, Charlotte County Public Works Department, and kept on file at the LTF office.

6.7.4.1 LTF Influent

The influent flow is a combination of raw leachate from the landfill collection system, sanitary sewage, and runoff from the co-composting program at the County's Zemel Road Landfill. The composting program combines dewatered biosolids from the East Port WRF with yard waste to create an organic soil conditioner. The composting operation is on a concrete-paved area near the LTF, and FDEP requires the runoff be captured and treated at the LTF. Since the area is remote and no wastewater collection infrastructure is provided in the vicinity, the sanitary sewage from the plant office is also treated at the LTF.

The landfill collection system contains a network of underdrains, trenches, vertical excavations, and a slurry wall to capture and contain leachate seeping through the landfill. The LTF operators are not responsible for the landfill collection system but work with the Solid Waste Operations Manager to balance the flow since LTF operators must maintain a static head differential between the water level on the inside and outside of the landfill slurry wall to keep an inward groundwater gradient across the slurry wall. This operation is completed to prevent leachate from leaving the site as required by permit. The landfill leachate combines with the plant office sanitary sewer and the landfill underdrains outside the slurry wall and enters the influent pump station.

6.7.4.2 Influent Pump Station

The influent pump station (PS-1) was rehabilitated in 2023 and is in excellent condition, however the operator reports pumping capacity is not as expected. CCU is working with the design engineer to resolve the issue. Although the influent is primarily fed by the gravity-driven network, a significant amount of storage is within the landfill collection system, which provides some operational flexibility for the LTF and can be used if PS-1 is temporarily out of service.

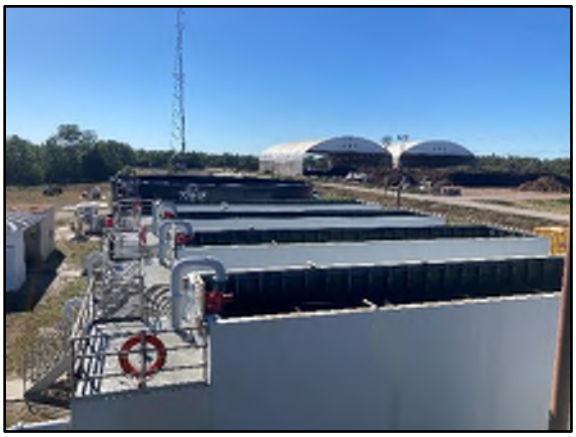
The influent pumps convey leachate into the 125,000-gallon influent holding tank and through the influent plant flow meter to record the daily influent leachate volumes; the influent holding tank and influent pump station were rehabilitated in FY 2023. A high-level sensor automatically shuts off the pump in the No. 1 Pump Station to prevent overfilling of the raw leachate tanks.

6.7.4.3 PAC Treatment

The plant pumping station (PS-2) transfers leachate from the influent holding tank to the batch treatment tank units Monday through Friday when operators are present. On weekends, the Chief Operator monitors (PS-1) the level in the influent tank via SCADA.

The PACT system uses a combination of PAC and active aerobic bacteria to simultaneously adsorb and metabolize leachate contaminants. The LTF contains three parallel treatment units each consisting of a 45,000-gallon tank, chemical feed, aeration, and pumping systems. Approximately 30,000 gallons of raw leachate are pumped from the influent storage tank into the PACT tank for chemical addition, mixing, holding, and settling. One hundred pounds of fresh PAC and 3,500 mL of phosphoric acid are added to each PACT tank. The contents are

mixed by aeration for approximately 7 hours. Approximately 135 mL of polymer is added to each PACT tank to assist in settling out the carbon and biomass from the effluent. The material in the PACT tanks settles for approximately 1 hour. After settling is completed, the decant water is pumped to the filter equalization storage tank. The carbon sludge remains in each PACT tank and is reactivated when the next batch of leachate is introduced for processing. Waste sludge is removed from the PACT tanks as necessary (typically weekly) by pumping to the sludge drying beds.



The three PACT units are in good-to-poor condition. The tanks' exteriors and interiors are in good condition since they were partially painted in FY 2017 and completed in FY 2018. Surfaces were pressure washed and rust and lost paint were removed and primed before painting was completed. The polymer feed systems and blower air intakes for the treatment trains should be replaced.

6.7.4.4 Filtration

The filter EQ tank is a glass-lined steel tank with a capacity of 107,000 gallons. The filter feed stream flows by gravity through the sand filter system and is pumped from the sand filter to the effluent storage tank. The sand filter compressor was replaced in FY 2020, but the mechanical parts of the sand filter remain in poor condition and should be replaced. No back-up is provided for the treatment equipment, which makes maintenance and repair work more difficult to coordinate. The installation of a second filter or provisions to provide temporary filtration connection should be investigated as needed based on plant operating conditions.

6.7.4.5 Effluent Storage and Disposal

The effluent disposal system contained a storage tank, submersible pumps, and a deep injection well. LTF effluent is stored and equalized in an effluent storage tank so that the injection well down-hole flow does not exceed 320 gpm. LTF effluent is pumped from the effluent storage tank into the injection well by two dry-pit submersible pumps. Effluent is typically disposed of the same day it is treated. Most of the effluent is pumped into the deep injection well, with a small volume used for dust control at the landfill. The deep injection well typically operates 6 days per week, but operation can be adjusted according to leachate production and effluent disposal requirements.

The effluent storage and disposal systems are in fair condition and are properly maintained to meet the facility needs. The facilities were recently painted. The existing 12-HP pumps were installed by CCU personnel in 2015. The pumps are submersible type and are operating satisfactorily under their typical operating period of approximately 7 hours per day. However,

the pumps' exposed exteriors generate high heat, creating a risk of skin exposure to operators.

6.7.4.6 Solids Handling Facilities

The LTF has a sludge digestion tank that historically was used for solids handling but is no longer in operation. Today, waste solids (mixed carbon and biological waste sludge) are conveyed directly from the PACT tanks and allowed to dry through evaporation. The LTF contains eight 725-square-foot (approximately 5,800 square feet total) sludge drying beds. A Bobcat loader is used for sludge removal for maximum maneuverability within the sludge drying beds. Grit is removed from the batch process tanks, as necessary, and dried with biosolids. The Bobcat removes and dumps dried solids into a dumpster that is hauled to the landfill for use as cover on the landfill. The sludge drying beds are well maintained and sufficient drying bed area for dewatering of solids.

6.7.4.7 Auxiliary Power

The LTF has no auxiliary standby power, and according to discussions with staff, power outages used to occur frequently. During off hours, the power supply is monitored through the high-level alarm at PS-1, which is monitored at the East Port WRF. Power outages that stop the aeration process for more than a day severely impact the microorganisms and process treatment, resulting in the need for seed sludge to restart the biological process again.

6.7.4.8 Wet-Weather Storage

October to May of FY 2017 was dry with less than 15 inches of rain out of an annual average total of 67 inches County-wide. The single largest storm event was Hurricane Irma, which made landfall on September 10, 2017, and deposited approximately 8 inches of rain in the Charlotte County area. Even with the heavy rains and storm conditions, the LTF was able to sufficiently process the leachate using the storage within the landfill and influent EQ tank.

6.7.5 OPERATIONS

The LTF is operated as a batch sequence reactor currently treating leachate 5 days per week, Monday through Friday, during working hours and is manually controlled by staff. During wet-weather periods or following a maintenance or repair event, the Chief Operator may operate on weekends, as determined necessary to process the leachate volume. Adding maintenance staff can support the efforts made by the Chief Operator to appropriately respond to unexpected events.

The overall system, from PS-1 to the injection well, has several capacity differences. If operated continuously, PS-1 has a pumping capacity of 0.22 MGD, the PACT process has a 0.250-MGD capacity, and the injection well has a 0.46-MGD capacity. In the event of excess flows, the operational treatment period could be extended to increase the volume treated per day. Alternately, the sludge digestion tank could be converted to a fourth PACT unit.

6.7.6 MAINTENANCE

The LTF is owned by the Charlotte County Public Works Solid Waste Division and operated by CCU personnel. The Chief Operator and Assistant Operator complete routine maintenance on a scheduled basis. Emergency maintenance and/or and routine maintenance and repairs are

performed using in-house Operations personnel or outside contractors to maintain regulatory compliance. A dedicated maintenance worker for the facility or scheduled maintenance worker at the facility during a specific number of days per week will mitigate issues with operators, focusing on maintenance issues and performing the work. Rehabilitation or replacement of major pieces of equipment is included in the annual CIP updates, which are coordinated with Public Works and completed at their discretion.

6.7.7 Review of Previous Annual Report Recommendations

Table 6-25 shows the recommendations for the LTF from the 2022 Annual Report and their current status.

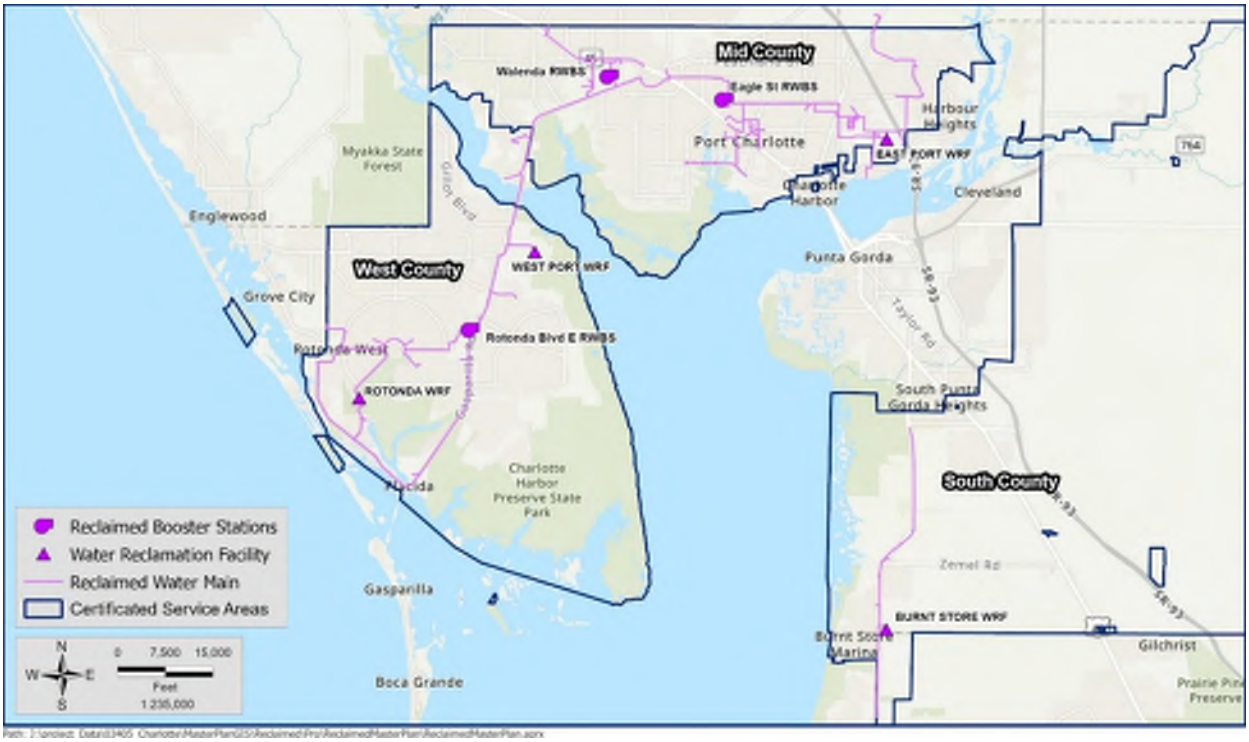
Table 6-25 LTF 2022 Recommendations and Status

Recommendation:	Complete rehabilitation of the influent holding tank. Work is scheduled to be performed in 2023.
Progress:	Completed.
Recommendation:	Install the new carbon holding tank. Staff noted the tank has been ordered.
Progress:	Carbon holding tank structural modifications with new paint job were completed.
Recommendation:	Evaluate ways to address the effluent tank transfer pumps having high heat output and being open to exposure, prioritizing safety. Potential solutions include installing safety features, installing cooling jackets, or replacing pumps with non-submersible-type pumps.
Progress:	Ongoing.
Recommendation:	Add a generator to the treatment facility to keep the plant operational during power outages.
Progress:	Currently being pursued through FEMA grants.
Recommendation:	Complete rehabilitation and upgrades of the influent pump station. Work scheduled to be performed in May 2023.
Progress:	Completed.

7 RECLAIMED WATER DISTRIBUTION SYSTEM

One of CCU's goals is to maximize the beneficial use of reclaimed water and reduce the impact on other water resources. This Chapter presents the CCU reclaimed water distribution system components and condition assessments of those system components and reviews CCU's backflow and cross-connection prevention program. Similar to the water distribution systems discussed in Chapter 4, CCU operates two reclaimed water distribution systems. The MRS is supplied public-access-quality reclaimed water from the East Port, West Port, and Rotonda WRFs, and serves the Mid and West County service areas. The Burnt Store reclaimed water distribution system is fed by the Burnt Store WRF and serves the South County service area. Figure 7-1 shows the County-wide reclaimed water distribution systems.

Figure 7-1 CCU Reclaimed Water Distribution Systems



At the time of this report, the two systems contained approximately 89 miles of reclaimed water mains providing service to 85 reclaimed water customer connections in the MRS and six connections in the Burnt Store system. The CCU reclaimed water distribution system consists of the following major components:

- Transmission mains that supply reclaimed water to bulk users and distribution mains serving pressurized customers.
- Reclaimed water booster stations (RWBSs) adjacent to GSTs for maintaining distribution system pressures.
- Lined and unlined ponds at the WRFs for reclaimed water storage during periods of reduced demand.
- Pond discharge sites that allow the operators to remotely shut off the flow of reclaimed water to bulk customers using irrigation ponds.

7.1 MASTER REUSE SYSTEM

CCU's reclaimed water distribution system serving Mid and West Counties is known as the MRS. The MRS operates under a Master Reuse Permit approved by FDEP that allows CCU to move reclaimed water from East Port WRF, West Port WRF, and Rotonda WRF to customers. The development and interconnection of the MRS evolved from the County observing an excess of reclaimed water supply produced in Mid County and reclaimed water demand remained more prevalent in West County. The MRS currently has a permitted capacity of 10.23 MGD AADF in combined flows from East Port WRF, West Port WRF, and Rotonda WRF (R-001). The MRS infrastructure includes high-service pump stations and reclaimed water storage at each WRF, and three RWBSs. Overall, the MRS has a combined reclaimed water storage throughout the system of 119 MG (ponds and GSTs).

7.1.1 RECLAIMED WATER BOOSTER STATIONS

The MRS contains three active RWBSs, two of which include 0.5-MG GSTs. The booster stations are used to maintain the flow and pressure throughout the system and work in conjunction with the reclaimed water pumping stations at the WRFs; typically, the systems operate between 80 and 100 psi. Jones Edmunds staff visited the RWBSs on January 26, 2024, and describe the RWBS components and condition assessments in this section.

7.1.1.1 Eagle Street – RWBS

The Eagle Street RWBS, constructed in 2008, is approximately 5 miles west of the East Port WRF along the 16-inch reclaimed water transmission main. The station is within a fenced area in a residential neighborhood near Tamiami Trail and contains two concrete buildings and a 0.5-MG concrete GST. The GST is equipped with a level sensor to regulate volume and a check valve to allow reclaimed water to bypass the station. Operations staff indicated this booster station is used when transferring flow to West County. More specifically, the Eagle Street RWBS supplements pressure and flow during times of high demand when the GST at Walenda RWBS operates at low-water level.

The RWBS contains one 125-HP HSP and one 60-HP jockey pump. The HSP has a pumping capacity of 1,440 gpm, and the jockey pump has a pumping capacity of 577 gpm. Each pump is controlled by a VFD to maintain system pressure for instantaneous customer use. The pumps are housed in a concrete building along with unused chemical feed pumps. An inline filter is downstream of the pumps; however, this filter mechanism is currently offline.

Pump operations, flow, and pressure are monitored 24 hours per day through a County-wide SCADA telemetry system. The PLC and electrical control center are housed in a separate air-conditioned building. Operators can inject sodium hypochlorite after the reclaimed water enters the GST, but disinfection at this location is not currently needed or used.

A modification to the Walenda RWBS in 2019 provided additional pressure for commercial reclaimed water customers in the Eagle Street area and reduced the dependence on the Eagle Street RWBS.

O&M improvements completed at the RWBS over the past 3 years consist of the following:

- 2023 – Replaced Pump No. 1.
- 2023 – Replaced the motor on Pump No. 2.

Condition Assessment

Jones Edmunds completed an on-site review of the plant on January 25, 2024; the information gathered at that time was used to update this section in accordance with the project scope. In general, the electrical room equipment, pump room equipment, and tank were found in good condition. However, the screens on the pressure transducers have been damaged by sunlight exposure and need replacing. Additionally, the piping needs proper coating and repainting.

The following deficiencies were noted:

- The pipes were not painted properly and need new coating and repainting.
- The pressure transducer screens are worn out from sun damage and need replacing.
- The anchor system on the sodium hypochlorite tank is rusted and needs replacing.

7.1.1.2 Walenda RWBS

The Walenda RWBS is at 17177 Walenda Avenue, Port Charlotte, approximately 4.5 miles northwest of the Eagle Street RWBS. The station was constructed in 2008 and is within a proposed residential/ commercial neighborhood known as West Port. In FY 2019, the Walenda RWBS was modified to provide pressure to the reclaimed water system along US 41 between Enterprise Boulevard and Cornelius Boulevard.

The site is fenced and contains reclaimed and potable water infrastructure including reclaimed and potable water GSTs. The gates and buildings are kept locked. The reclaimed water GST has a capacity of 0.5 MG and is equipped with a level sensor. The RWBS contains one 125-HP HSP and one 60-HP jockey pump, each equipped with VFDs. The HSP has a pumping capacity of 1,440 gpm, and the jockey pump has a pumping capacity of 577 gpm. The pumps and chemical feed system are in a concrete building. An inline filter is downstream of the pumps; however, this filter mechanism is currently offline.

Pump operations, flow, and pressure are monitored 24 hours per day through a SCADA telemetry system. The PLC and electrical control center are housed in a separate air-conditioned building. Like the Eagle Street RWBS, operators can inject sodium hypochlorite after the reclaimed water enters the GST, but disinfection at this location is not currently needed.

The Walenda station is available for pumping and storage but currently operates in an as-needed mode by CCU staff based on system demands. The hydraulic modeling for the reclaimed water system indicates that the Walenda station will be an essential component for meeting the future reclaimed water demands.

Condition Assessment

Jones Edmunds completed an on-site review of the plant on January 26, 2024; the information gathered at that time was used to update this section, in accordance with the project scope.

The access roads outside the facility are aging and need to be repaved but are in fair condition inside the property. The site fences are damaged and need to be repaired or replaced. Fallen trees are around the site with one leaning against the aboveground storage tank that will require complete removal. The roof over the chemical storage tanks has missing shingles from hurricane winds that need to be replaced. The bypass actuator is currently held on by a strap and needs to be properly secured. The GST level indicator is broken and needs to be replaced. Additionally, pressure transducer screens are damaged from sunlight exposure and need replacing. The HSPs are well maintained and functioning properly.

The electrical room equipment, pump room equipment, and storage tank are in good condition. The piping was painted purple but needs repainting. The grounds are well maintained.

The following deficiencies were noted:

- The access roads outside the facility are washed out and need to be repaved.
- The site fences are damaged and need to be repaired or replaced.
- The site has fallen trees with one leaning against the aboveground storage tank.
- The roof over the chemical storage tanks has missing shingles.
- The bypass actuator is held on by a strap and needs to be properly secured.
- The GST level indicator is broken and needs to be replaced.
- Pressure transducer screens are damaged from sunlight exposure and need replacing.

7.1.1.3 Gertrude RWBS

The Gertrude site is at 21131 Gertrude Avenue, Port Charlotte, approximately 4.6 miles northwest of the East Port WRF. The station was originally used for the potable water system but was decommissioned in 2008. CCU is evaluating the rehabilitation of the site for use as a RWBS. The site currently consists of a 0.5-MG GST and 600-square-foot concrete building. The GST was previously cleaned and lined in 2004. The addition of the station will increase the resilience of the Master Reuse System, provide operational flexibility, and provide pressure and reclaimed water storage in the surrounding area.

Condition Assessment

Due to its currently decommissioned status, this station was not assessed as part of this report. However, CCU continues to evaluate rehabilitation opportunities to use this site and its available equipment.

7.1.1.4 Rotonda Blvd East RWBS

The Rotonda Boulevard East RWBS is on Rotonda Boulevard East just west of CR 771. The station was completed in FY 2014 and is an in-line RWBS that does not contain a GST. An architectural wall and chain link fence shield the station from the highway, and access gates are kept locked. The RWBS contains one 100-HP high-head HSP and two 40-HP low-head HSPs, each equipped with VFDs. The 100-HP HSP has a pumping capacity of 972 gpm, and the 40-HP HSPs have a pumping capacity of 1,045 gpm each. Pump operations, flow, and pressure can be monitored 24 hours per day through a SCADA telemetry system. The PLC and electrical control center are housed under a covered area. The station is currently used to help maintain system pressure in West County and back pressure to Mid County; however, this RWBS can also be used to help convey flows as the County's reclaimed water demands continue to increase in West County.

This is a complex pump station with multiple operational configurations. The RWBS was configured to allow operation in multiple modes, which include pumping from Mid County to West County, pumping from Rotonda WRF to West Port WRF, or pumping from West Port WRF to the West County customers. CCU staff are evaluating the hydraulics of this station to improve the operational configurations and settings for the RWBS.

The following O&M improvement was completed at the RWBS over the past 3 years:

- 2023 – Replaced the motor for Pump No. 3.

Condition Assessment

Jones Edmunds completed an on-site review of the plant on January 26, 2024; the information gathered at that time was used to update this section, in accordance with the project scope.

The station was in good condition overall. However, some minor issues exist that need attention.

The following deficiencies were noted:

- The external wall panels are damaged and still need replacing.
- Pressure transducer and gauge screens have been damaged from sunlight exposure and need replacing.
- Pipes need to be coated and repainted.
- Some flexible conduits are worn down and need replacing.
- Equipment should be recalibrated.

7.1.2 STORAGE

Reclaimed water storage is provided by a combination of lined and unlined storage ponds at the WRFs and GSTs in the distribution system. Table 7-1 lists the storage capacity and type

for each of the reclaimed water storage sites. Currently, Operations staff at the East Port WRF monitors reclaimed water levels in the ponds and GSTs through SCADA. The Master Reuse System is now operated as a pressurized system to allow customers to draw reclaimed water when needed. The WRF ponds and GSTs are kept full to meet customer demands. Excess reclaimed flows are conveyed to deep injection wells or other permitted disposal methods as specified in the WRF's permits.

Table 7-1 Reclaimed Water Storage Capacity and Location

Site	Location	Storage Type	Storage Capacity (MG)
East Port WRF	Mid County	Lined Pond	95.0
West Port WRF	West County	Lined Pond Lined Pond	15.0 5.0
Rotonda WRF	West County	GST Unlined Pond	3.0 —[1]
Walenda RWBS	Mid County	GST	0.5
Eagle Street RWBS	Mid County	GST	0.5
		Total	**119.0**[2]

[1] Currently not being used and planned for demolition as part of Rotonda WRF expansion project.
[2] Values exclude reject pond storage.

The GSTs at the Walenda and Eagle Street sites are filled by system feed and used to maintain the distribution system pressure during peak demand. The GSTs also provide the following functions for the CCU reclaimed water supply system:

- Minimize high pumping pressures at the WRFs.
- Provide local storage for nightly peak irrigation demands when the flows at the WRFs are lowest.

7.1.3 Current and Future Reclaimed Water Customers

Currently, most customers use the reclaimed water for irrigation purposes. CCU's reclaimed water customers are a combination of bulk users who receive water through pond discharges and then repump as needed for irrigation and direct-pressurized customers whose irrigation systems are connected to the reuse system. As noted in the Reclaimed Master Plan, CCU's current focus is on large users to maximize the offset of freshwater supplies.

West County contains nine 18-hole golf courses and residential/commercial developments that have marginal access to good freshwater irrigation sources. Currently, five golf courses and several smaller reclaimed water customers are receiving reclaimed water for irrigation; however, additional golf courses have committed to be future large users. Service of reclaimed water to West County is limited by the amount of reclaimed water that is produced by the two WRFs in west Charlotte County, the Rotonda WRF and the West Port WRF. The ultimate capacity of the reclaimed water system in the East Port WRF, West Port WRF, and Rotonda WRF service areas is extensive due to the number of residential developments, golf courses, and other reclaimed water demands in the area.

Table 7-2 and Table 7-3 list the agreement amounts for current and future reclaimed water users in Mid and West County, respectively. The agreement amount columns and total

agreement amount rows indicate ultimate or potential future flows, whereas the current agreement amount row estimates reclaimed water capacity for current users, assuming supply is available. The County has signed agreements for current reclaimed water customers equaling approximately 6.471 MGD of reuse for the MRS. Additionally, future user flow is expected to add approximately 0.139 MGD of reclaimed water, indicating a total potential near-term demand of approximately 6.610 MGD in Mid and West County combined. However, it should be noted that some future reclaimed water user agreement amounts are unknown at this time, which will ultimately increase the total demand.

Table 7-2 Current and Future Mid County Reclaimed Water Users

Reclaimed Water Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
7-Eleven # 37528	Direct	Current	0.001
Auto Zone – 19681 Cochran	Direct	Future	TBD
BJs Wholesale Club	Direct	Current	0.011
Burger King – Murdock	Direct	Current	0.001
CCCS – Fire Station # 2	Direct	Current	0.001
CCCS – Sheriff's Office	Direct	Current	0.011
CCCS Parks – 1120 Centennial Boulevard (Aquatic)	Direct	Current	0.002
CCCS Parks – 1185 Centennial Boulevard (Ball Fields)	Direct	Current	0.050
CCCS Parks – Franz Ross	Direct	Current	0.048
CCCS Parks – McGuire Park & LS #11	Direct	Current	0.006
CCCS Parks – Sports Park	Pond	Current	0.250
CCPW – Edgewater Median 1	Direct	Current	0.010
CCPW – Edgewater Median 2	Direct	Current	0.010
CCPW – Edgewater Median 3	Direct	Current	0.010
CCPW – Edgewater Median 4	Direct	Current	0.010
CCPW – Edgewater Median 5	Direct	Current	0.010
CCPW – Edgewater Median 6	Direct	Current	0.010
CCPW – Edgewater Median 7	Direct	Current	0.010
CCPW – Edgewater Median 8	Direct	Current	0.010
CCPW – Elkam Boulevard 1	Direct	Current	0.010
CCPW – Elkam Boulevard 2	Direct	Current	0.010
CCPW – Harbor Blvd (median 3115)	Direct	Current	0.010
CCPW – Olean 1 (21175-M)	Direct	Current	0.010
CCPW – Olean 2 (21298-M)	Direct	Current	0.010
CCPW – Olean 3 (21405-M)	Direct	Current	0.010
CCPW – Toledo Blade North of US 41	Direct	Current	0.004
CCPW – US 41 Median north of 776	Direct	Current	0.001
CCPW – US 41 Median north of 776	Direct	Current	0.001
CCPW – US 41 Median north of 776	Direct	Current	0.001
CCPW – US 41 Revitalization PC Boulevard	Direct	Current	0.010

Reclaimed Water Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
CCPW – US 41 south of PC Boulevard	Direct	Current	0.002
CCU – LS # 18 Lift Station ODC	Direct	Current	0.010
CCU – LS # 59 Skylark Vac Station	Direct	Current	0.005
CCU – LS # 99 El Jobean Vac Station	Direct	Current	0.005
Charlotte Convenience (7-11)	Direct	Current	0.002
Charlotte Crossing	Direct	Current	0.005
Deep Creek Golf Club	Pond	Current	0.180
Family Dollar – Rampart	Direct	Future	0.001
Gulf Cove United Methodist Church	Direct	Current	0.012
JRE Millennium Phy Group	Direct	Current	0.015
Kia of Port Charlotte	Direct	Current	0.015
Kingsway Country Club (GC)	Pond	Current	0.230
Kravin Chikin	Direct	Future	TBD
Maple Leaf Estates	Pond	Current	0.388
Marylou Home Owners Assoc.	Direct	Current	0.038
Mazda of Port Charlotte	Direct	Future	TBD
Ming Zhou - B.O.A.	Direct	Current	0.001
MRI Partners LLC	Direct	Current	0.001
MRT Landscaping	Direct	Current	0.025
Murphy Oil USA #7360 – Murdock	Direct	Current	0.001
Myakka RV Park	Direct	Current	0.040
North Port Freestanding ER	Direct	Current	TBD
Parkside Memory Cottage	Direct	Current	0.002
Pt Char G. C. – Golf Links	Pond	Current	0.613
Pt. Charlotte Church of Christ	Direct	Current	0.001
Rick Johnson Auto	Direct	Current	0.000
Riverwood (GC)	Pond	Current	1.200
Shorepoint Health Port Charlotte	Direct	Current	0.008
Suncoast Lakes Home Owners	Direct	Current	0.067
Sunnydell Commons II	Direct	Current	0.004
Tamiami Investment Partners, LLC	Direct	Current	0.010
Tommy's Car Wash	Direct	Current	0.002
Wal-Mart #721	Direct	Future	0.018
Waste Management	Direct	Current	0.008
West Port Community Development District	Pond	Current	0.450
Current Mid County Reclaimed Water Agreements			3.874
Total Mid County Reclaimed Water Agreement Amounts			**3.893**

Note: TBD = To be determined.

Table 7-3 Current and Future West County Reclaimed Water Users

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Anglers Club	TBD	Future	0.050
Bel Aire	TBD	Future	TBD
Boca Vista	Direct	Current	0.008
CCPW – 10320 Winborough	Direct	Current	0.001
CCPW – 8110 Wiltshire	Direct	Current	0.001
CCPW – 8400 Wiltshire	Direct	Current	0.001
CCPW – 9100 Winborough	Direct	Current	0.001
CCPW – Gasparilla Road (FUTURE)	TBD	Future	0.010
CCPW – Winchester / Sunset	Direct	Current	0.020
Coast Concrete	Pond	Current	0.060
Colonial Concrete	Direct	Current	0.008
Coral Caye (Placida Commons)	Direct	Current	0.095
Coral Creek Air Park (BK IV AS LLC)	Direct	Current	0.045
Coral Creek Club	Pond	Current	0.308
Dollar General – 322 Ingram	Direct	Current	0.002
Fellowship Church	Direct	Current	0.027
Hacienda Del-Mar	Direct	Current	0.105
Hammocks	TBD	Future	0.060
Harbor West	Pond	Current	0.144
Hills Golf Club	TBD	Future	TBD
Landings at Coral Creek	Direct	Current	0.120
Lemon Bay Golf Course	Pond	Current	0.342
Meadows & Villas Conservation Area – Robin	Direct	Current	0.002
Meadows & Villas Conservation Area – Rot Tr	Direct	Current	0.002
Placida Harbour	Direct	Current	0.019
Preserve at Windward Condominium	Direct	Current	0.005
RGP Links Golf Club	Pond	Current	0.290
RGP Long Marsh North	Pond	Current	0.225
RGP Long Marsh South	Pond	Current	0.225
RGP Palms Golf Club	Pond	Current	0.290
Rotonda NW Golf Club	Pond	Future	TBD
Rotonda Sands	Pond	Future	TBD
Safe Cove Boat Storage	Direct	Current	0.003
South Gulf Cove	Pond	Future	TBD
Windward Patio Homes	Direct	Current	0.250
Current West County Reclaimed Water Agreements			2.597
Total West County Reclaimed Water Agreement Amounts			**2.717**

7.1.4 DISCHARGE VALVE STATIONS

Many of the larger reclaimed water users are golf courses and golf course communities that receive reclaimed water through pond discharge valve stations. These stations generally contain the following:

- A flow meter.
- Gate valves with motorized actuators.
- Pond-level indicators.
- Pressure-indicating transmitters.
- Isolation valves.
- Air-relief valves.
- Telemetry and SCADA.

Most of the pond discharge stations include a valve with a motorized actuator that allows CCU to remotely open or close the valve via SCADA. Most of the motorized actuators also allow the valve to be partially opened to a specified percent-open setting, which throttles the reclaimed water discharge to maintain a set flow rate or system pressure. Motorized valves without a percent-open setting only have an open or closed setpoint, which does not allow control of flow or system pressure.

The discharge ponds also include pond-level indicators to prevent too much reclaimed water from being conveyed to the ponds and leading to overflows. Some community developments such as Aileron Golf Club (formerly Kingsway Country Club), Maple Leaf Golf Course, Deep Creek Golf Club, and West Port Community Development District have stormwater storage lake systems (D-001, D-002, D-003, and D-004, respectively) that are also used for reclaimed water storage. These lakes contain adjustable weir gates and intermittently overflow to stormwater ditches that ultimately drain into the Peace River. Maintaining an adequate level in these lakes to avoid overflowing is a high priority for CCU staff. Table 7-4 summarizes the current pond discharge reclaimed water customers, their control valve type, and whether they are identified in the master reuse permit as a stormwater storage lake.

Table 7-4 Existing Pond Discharges

Reclaimed Water Customer	Pond Discharge Type
Mid County Customers	
Riverwood CDD	Control Valve, Electronic Throttling
Port Charlotte Golf Course	Control Valve, Electronic Throttling
CC Parks Department Sports Park	Control Valve, Electronic Throttling
Maple Leaf Estates*	Manual Valve, Manual Throttling
Deep Creek Golf Club*	Control Valve, Electronic Throttling
Aileron Golf Club*	Control Valve, Electronic Throttling
West Port Community Development District*	Control Valve, Electronic Throttling
West County Customers	
Lemon Bay Golf Course	Control Valve, Electronic Throttling
Coral Creek Club	Control Valve, Electronic Throttling
RGP Palms Golf Course	Control Valve, Electronic Throttling
RGP Long Marsh South	Control Valve, Electronic Throttling
RGP Long Marsh North	Control Valve, Electronic Throttling

Reclaimed Water Customer	Pond Discharge Type
RGP Links Golf Course	Control Valve, Electronic Throttling
Harbor West	Control Valve, Electronic Throttling

*Permitted stormwater storage lake system.

7.1.5 OPERATIONS

High-quality reclaimed water produced at the East Port, West Port, and Rotonda WRFs is stored in the on-site storage ponds or off-site GSTs during periods of low demand. Currently, the East Port WRF produces the most reclaimed water within the Mid and West County Master Reuse System. The East Port WRF contains two reclaimed water HSP stations, although HSP No. 2 serves as the primary pump station for conveying reclaimed water from the 95-MG storage pond to Mid and West County, and HSP No. 1 is used for plant water and as a backup to HSP No. 2. CCU attempts to maintain a minimum system pressure of 50 psi to all customers. The direct pressurized and pond customers in Mid County are primarily supplied from the East Port WRF since demand is higher in West County. The Walenda and Eagle Street RWBSs are available for reclaimed water pumping and storage and operate as needed by CCU staff based on system demands. The reclaimed water in the GSTs is recirculated to maintain water quality.

The West County portion of the Master Reuse System is primarily supplied by the West Port and Rotonda WRFs, but also is fed water from East Port WRF via the Master Reuse System. The West Port WRF has two lined reclaimed water storage ponds used to store reclaimed water produced during the day for distribution at night or to store excess reclaimed water during wet-weather periods. West Port WRF contains one reclaimed water pump station that is used to convey flows to the Master Reuse System. Rotonda WRF has an unlined reclaimed water storage pond and GST on site and operates two different reclaimed water pump stations. The reclaimed water infrastructure at these WRFs is used to provide reclaimed water to pressure and the customers through the Master Reuse System and is operated together with constant communication by the operations personnel.

7.2 BURNT STORE SYSTEM

The Burnt Store reclaimed water distribution system is provided reclaimed water from the Burnt Store WRF to serve the South County service area. In South County, a 7-mile-long reclaimed water transmission along Burnt Store Road serves as the primary conveyance pipe of the reclaimed water system. The transmission main was originally constructed in 2006 to serve the community Heritage Landings (previously known as Tern Bay golf course) but never received reclaimed water because the community did not develop as expected. However, three smaller users benefited from the transmission main and currently receive low-pressure reclaimed water from the Burnt Store WRF. As mentioned in Chapter 6, the reuse system is currently permitted for 2.26 MGD; however, significant limitations exist for providing the flows of this quantity including reclaimed water supply, pumping capacity, and storage capacity.

Several large developments are underway or planned in South County that will significantly increase the wastewater and reclaimed water flows in the service area. In 2019, the County engaged the services of consultants McKim & Creed and Jones Edmunds to design an expansion of the Burnt Store WRF. The project will address the current pumping and storage

limitations and allow CCU to connect more users to the Burnt Store reclaimed water distribution system and upgrade the WRF to meet advanced AWT standards.

7.2.1 Reclaimed Water Booster Stations

The Burnt Store system does not currently contain any RWBS; rather, the pump capacity is provided solely from the Burnt Store WRF reclaimed water pump station. The station contains two constant-speed high-service pumps with a capacity of 900 gpm each. The reclaimed water pumps discharge into an 7-mile-long 12-inch/16-inch reclaimed water transmission main that conveys reclaimed water to customers via direct irrigation system delivery or to on-site storage ponds to meet customer-controlled irrigation schedules.

7.2.2 Storage

The Burnt Store system has limited storage since no storage exists within the distribution system and the storage at the WRF is limited to the clearwell under the reclaimed water pump station.

However, the Burnt Store WRF expansion project currently proposes to convert the existing RIBs to reclaimed water storage ponds and a reject pond, as well as a GST.

7.2.3 Current and Future Reclaimed Water Customers

Currently, three reclaimed water customers are served by the Burnt Store system in South County and CCU uses a small amount of reclaimed water for drip irrigation of landscaping along the development entranceways and common areas. CCU is pursuing other potential bulk reclaimed water users, such as golf courses, that have expressed interest in using reclaimed water in irrigation storage ponds, like the Burnt Store Marina & Golf Club. Table 7-5 lists the current and potential future major reclaimed water users within the Burnt Store WRF service area. Although the total potential future reclaimed water user demand is noted as approximately 2.117 MGD, Heritage Landing has expressed interest in receiving future flows up to 1.5 MGD, which would increase the total to approximately 3.5 MGD.

Table 7-5 Burnt Store System Current and Potential Future Reclaimed Water Users

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Burnt Store Colony 1	Direct	Current	0.008
Burnt Store Colony 2	Direct	Current	0.008
Burnt Store Lakes	Direct	Current	0.048
Burnt Store Marina & GC	Pond	Future	1.920
City of Cape Coral	TBD	Future	0.085
CCCS – Fire Station # 5	Direct	Current	0.001
CCPW – Cape Horn	Direct	Current	0.000
CCPW – Burnt Store Village Landscape	Direct	Current	0.004
Dollar General (Burnt Store)	Direct	Future	0.003
Heritage Landing	Pond	Future	0.125

Reclaim Sites	Pond/ Direct	Current/ Future User	Agreement Amount (MGD)
Tuckers Pointe	Pond	Future	TBD
Current Burnt Store Reclaimed Water Agreements			0.197
Total Burnt Store Reclaimed Water Agreement Amounts			**0.282**

7.2.4 Discharge Valve Stations

Currently, no pond discharge valve stations are in the Burnt Store system.

7.2.5 Operations

The WRF's pump station is used to convey reclaimed water from the Burnt Store WRF to the 8.5-mile-long 12-inch reclaimed water transmission main along Burnt Store Road. The system is operated at relatively low pressure, and users are currently responsible for supplying their systems with in-line pumps to boost pressure.

As with the MRS, forecasting and CIP planning are also conducted for the South County reclaimed water distribution system. The Burnt Store WRF operators are currently responsible for maintaining the reclaimed water components since the vertical infrastructure components are on site. As the system continues to expand, the Reclaimed Water Distribution workgroup will be responsible for maintaining the Burnt Store System.

7.3 Maintenance

The reclaimed water distribution system is inspected and monitored daily to meet FDEP requirements. Monthly inspections highlight the distribution equipment that may need repair, calibration, or replacement. An important element of the program is that reclaimed water sites are inspected yearly for possible cross-connections. The Backflow and Reclaimed Services staff coordinate with reclaimed water customers to keep them updated on the reclaimed water supply, inform them of operational problems, and provide information and guidance regarding FDEP and SWFWMD rules and regulations. The workgroup is also involved in documentation, inspection, and minor repairs of the reclaimed water distribution system.

7.4 Backflow and Cross-Connection Prevention Program

The Backflow and Cross-Connection Prevention Program uses two types of surveys to monitor customer water use and type – basic backflow equipment survey and cross-connection control survey. The basic backflow equipment survey is used to verify the site information of each water user. The cross-connection survey provides information on possible cross-connections and health-hazard levels. The information in the surveys is used to inform customers with the required description of the backflow prevention. A CCU database is being created that includes information on each water user, backflow prevention measures in place at their site, backflow testing requirements, and communication with the customer. This information satisfies the FDEP requirements for implementation of a Backflow and Cross-Connection Prevention Program. CCU's Cross-Connection Control Manual provides the structure by which the program can be administered and a vehicle for changes as needed in the future. The program

includes testing and repair of backflow devices at County-owned facilities. This part of the program will increase as the database of backflow information increases.

The Cross-Connection Control Program reports inventory every calendar year (CY), in accordance with FDEP regulations. Inventory reported for CY 2023 is as follows:

- Cross-Connections Inspected: 0
- Charlotte County Backflow Tests: 3,345
- Potential Cross-Connections Corrected: 0

7.5 Review of Previous Annual Report Recommendations

Table 7-6 and Table 7-7 summarize the recommendations and their status from the 2022 Annual Report for the MRS and Burnt Store system, respectively.

Table 7-6 Master Reuse System FY 2022 Recommendations and Status

Recommendation:	Develop an operational protocol for the Mid/West County MRS. CCU staff intend to operate the reclaimed water system under a select number of operational configurations and will determine their preferred method for meeting their reclaimed water demands using the hydraulic model.
Progress:	Ongoing. Some operational items are addressed in the Reclaimed Water Master Plan.
Recommendation:	Install throttling control valves at all current major users with pond discharges in the Mid and West County areas.
Progress:	Installed as part of pond discharge assembly. All new pond users will be required to install this equipment per CCU standard.
Recommendation:	Develop Reclaimed Water Booster Station Design Standards.
Progress:	Ongoing.
Recommendation:	Complete repairs for facilities and assets that experienced hurricane-related damage.
Progress:	Ongoing.
Recommendation:	Maintain updated hydraulic models to predict the impact of future demand on the reclaimed water transmission systems.
Progress:	Ongoing.
Recommendation:	Develop and complete a community survey to better determine potential reclaimed water customers. Results of the study can be used to determine the economic feasibility of water delivery.
Progress:	Not completed.
Recommendation:	Continue to develop and host public education events to educate the community on the benefits of reclaimed water.
Progress:	Ongoing.
Recommendation:	CIP recommendations to improve capacities of treatment, storage, and pumping in the MRS for future demands is being developed in the Reclaimed Water Master Plan.
Progress:	CCU is finalizing the Reclaimed Water Master Plan with Jones Edmunds.

Recommendation:	Evaluate adding piping connections (including controls, pumps, valves, meters, etc.) to increase the number of reclaimed water small users in Mid County.
Progress:	Ongoing, but CCU is currently focused on adding large users and large developments.
Recommendation:	Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Progress:	Ongoing.
Recommendation:	Create a reclaimed water system O&M Manual and operating protocols.
Progress:	Not completed.

Table 7-7 Burnt Store Reclaimed Water Distribution System FY 2022 Recommendations and Status

Recommendation:	CIP recommendations to improve capacities of treatment, storage, and pumping in the Burnt Store system for future demands is being developed as in the Reclaimed Water Master Plan.
Progress:	In progress. CCU is finalizing the Reclaimed Water Master Plan with Jones Edmunds.
Recommendation:	Maintain updated hydraulic models for the Burnt Store system to predict the impact of future demand on the reclaimed water transmission systems.
Progress:	Ongoing.

8 ENGINEERING

The Engineering Division is responsible for preparing and managing engineering reports, studies, project designs, and construction observation and management. Charlotte County's Fiscal Services Division also plays a large role in the development and maintenance of the Capital Improvement Plan, which includes projects for the County's Utilities Department, CCU.

8.1 CAPITAL IMPROVEMENT PLAN

The County's Capital Improvement Plan is designed to plan and construct improvements to the CCU water, wastewater, and reclaimed water systems. As Charlotte County's population continues to grow, CCU's ability to develop plans that address the projected growth is vital. This section summarizes CIP projects in progress or initiated in FY 2023. In accordance with the County's Capital Improvement Plan policy, a project shall be considered a capital project if a planned expense exceeds $100,000 for an asset expected to have a useful life of 10 years or more.

Charlotte County develops and maintains a collective Capital Improvement Plan for certain public facilities, including utilities, as part of the Capital Improvements Element of the County's Comprehensive Plan (*Charlotte 2050*). The Capital Improvement Plan collectively refers to a Capital Improvement Program/CIP and Capital Needs Assessment (CNA); the CIP component consists of a 6-year forecast covering Year 1 through Year 6, and the CNA captures the following 14-year period from Year 7 through Year 20. The CIP is updated and adopted annually; the CNA is updated biennially.

Charlotte County develops and maintains a 6-year CIP that forecasts spending for approved CIP projects and is considered a link between the County's Comprehensive Plan and its fiscal planning process. The CIP focuses on the County's short-range physical needs, serving as a planning and implementation tool for development, acquisition, construction, maintenance and renovation of public facilities, infrastructure, and capital equipment.

The County also maintains a 20-year CNA that identifies projects beyond the initial 6-year CIP planning horizon. The CNA is not balanced with County revenues; the CNA serves as a basis of *potential* projects to be considered for inclusion in a County 6-year CIP.

During the time of this report, CCU staff was working on a major update to the CIP/CNA schedule.

8.1.1 CIP PROJECTS – WATER SYSTEM

Table 8-1 lists the water system CIP projects initiated or in progress during FY 2023. The total FY 2023 budget was $9.16 million and the total expenditure was $155,000. However, this does not include expenditures for removal and replacement (R&R) of existing facilities and assets or expenditures related to new developments.

Table 8-1 Water System CIP Projects in Progress or Initiated in FY 2023 ($ in Thousands)

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
Potable Water Master Plan	Oper	$ —	$ 104	0%
Emergency Interconnect to Punta Gorda-Burnt Store	Conn-Wtr	$ 890	$ 1	0%
Walenda Booster Station Upgrade	Conn-Wtr	$ —	$ 49	0%
Potable Water Master Plan Recommended	Conn-Wtr	$ 1,000	$ —	0%
Burt Store RO WTP-Plug-Abandon Well	Oper	$ —	$ —	0%
Campbell St to Chancellor to Myakka River 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Toledo Blade from Hillsborough to US 41 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Rotonda Booster Station Upgrades	Conn-Wtr	$ 500	$ —	0%
Golf Course Booster Station Upgrades	Conn-Wtr	$ —	$ —	0%
Gillot Blvd Water Main Upsizing	Conn-Wtr	$ 500	$ —	0%
Potable Water Storage Tank-South County	Conn-Wtr	$ 4,000	$ —	0%
Potable Water Elevated Tank-Mid County	Conn-Wtr	$ —	$ —	0%
Potable Water Elevated Tank-West County	Conn-Wtr	$ —	$ —	0%
Calumet to Robin Rd – Waterway Crossing SGC to Rotonda Meadows	Conn-Wtr	$ —	$ —	0%
Hillsborough/Cranberry Intersection Water Main (North Port)	Conn-Wtr	$ —	$ —	0%
Water Meter Study Recommended Improvements	Conn-Wtr	$ 2,000	$ —	0%
Babcock Ranch Water Supply	Conn-Wtr	$ —	$ —	0%
Major Water Transmission Lines	Conn-Wtr	$ 250	$ 1	0%
Major Water Transmission Lines	R & R	$ —	$ —	0%
Myakka River 24-inch Water Main	Conn-Wtr	$ —	$ —	0%
Myakka River 24-inch Water Main	SRF Pending	$ —	$ —	0%
Myakka Potable Water Booster Station	SRF	$ —	$ —	0%
Myakka Potable Water Booster Station	Conn-Wtr	$ 20	$ —	0%
Totals		$9,160	$155	2%

[1] Funding sources: Conn-Wtr = Water Connection Fee Fund; Oper = O&M Fund; R&R = Renewal & Replacement Fund; SRF = State Revolving Fund.

8.1.2 CIP Projects – Wastewater System

Table 8-2 lists the wastewater system CIP projects initiated or in progress during FY 2023. The total wastewater budget allotted for FY 2023 was $19,615,000, and the total amount spent was $12,554,000. However, the total spent does not include expenditures for removal and replacement (R&R) of existing facilities and assets or expenditures related to new developments.

Table 8-2 Wastewater System CIP Projects in Progress or Initiated in FY 2023 ($ in Thousands)

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
Wastewater Force Mains	Oper	$ —	$ —	0%
Wastewater Force Mains	Conn-Swr	$ 600	$ 407	68%
Spring Lake MSBU Wastewater Expansion	Oper	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	Grants	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	SRF	$ —	$ —	0%
Spring Lake MSBU Wastewater Expansion	MSBU	$ —	$ 16	0%
Wastewater Force Main Replacements	R & R	$ 35	$ 303	866%
Wastewater Force Main Replacements	Conn-Swr	$ —	$ —	0%
Wastewater Force Main Replacements	SRF	$ —	$ —	0%
Master Lift Stations	Conn-Swr	$ 750	$ —	0%
Grand Master LS – Loveland Blvd	UCPF	$ —	$ —	0%
Grand Master LS – Loveland Blvd	Conn-Swr	$ 177	$ —	0%
Grand Master LS – Loveland Blvd	SRF	$ —	$ —	0%
Myakka Potable Water Booster Station	Conn-Wtr	$ —	$ —	0%
Burnt Store Phase 2	Conn-Wtr	$ —	$ —	0%
Burnt Store Phase 2	Conn-Swr	$ —	$ —	0%
Burnt Store Phase 2	R & R	$ —	$ —	0%
Burnt Store Phase 2	UCPF	$ —	$ (11)	0%
Charlotte Harbor Water Quality Initiative Phase 2	BP	$ —	$ —	0%
Charlotte Harbor Water Quality Initiative Phase 2	Grants	$ —	$ —	0%
Charlotte Harbor Water Quality Initiative Phase 2	SRF	$ —	$ —	0%
Charlotte Harbor Water Quality Initiative Phase 2	MSBU	$ —	$ 21	0%
Burnt Store WRF Expansion	Conn-Swr	$ 6	$ 136	2267%
Burnt Store WRF Expansion	SRF	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
Burnt Store WRF Expansion	SRF Pending	$ —	$ —	0%
East Port WRF Expansion	SRF Pending	$ —	$ —	0%
East Port WRF Expansion	Conn-Swr	$ —	$ —	0%
East Port WRF Expansion	Conn-Swr	$ 5	$ 113	2260%
East Port WRF Expansion	Grants	$ —	$ —	0%
Cape Haze Sewer & Reclaim Transmission	Conn-Swr	$ —	$ —	0%
Cape Haze Sewer & Reclaim Transmission	R & R	$ —	$ —	0%
Charlotte Harbor Water Quality Project Septic to Sewer	ST	$ —	$ —	0%
CMOM Recommended Utility Improvements	Conn-Swr	$ 1,500	$ —	0%
CMOM Recommended Utility Improvements	R & R	$ 750	$ —	0%
CMOM Recommended Utility Improvements	Oper	$ 750	$ —	0%
CMOM Recommended Utility Improvements	DP	$ —	$ —	0%
Wastewater Force Main – SR 776 Snybrk to Gasp CR 771	Conn-Swr	$ 2,500	$ 19	1%
Odor Control System for Midway Blvd & Loveland Blvd	Oper	$ —	$ —	0%
East Port WRF Wetwell Cover and Ozone System	Oper	$ —	$ —	0%
West Port WRF Perimeter Fencing	Oper	$ —	$ —	0%
East Port WRF Deep Well Supply Line	Conn-Swr	$ —	$ —	0%
Veterans Wastewater Force Main US 41 to Peachland	Conn-Swr	$ —	$ —	0%
East Port WRF Equalization System	Conn-Swr	$ —	$ —	0%
Olean Blvd. Force Main – Easy Street to Loveland	Conn-Swr	$ —	$ —	0%
Olean Blvd. Force Main – Easy Street to Loveland	R & R	$ —	$ —	0%
West Port WRF Expansion 1.2- to 3-MGD	Conn-Swr	$ —	$ 423	0%
West Port WRF Deep Injection Well Capacity Increase	Conn-Swr	$ —	$ —	0%
Replace Filters at East Port WRF Stage 5	Oper	$ 300	$ —	0%
Safety Improvements at Vacuum Pump Stations	Oper	$ 200	$ —	0%
Sewer Master Plan Update Recommended Improvements	Conn-Swr	$ 500	$ —	0%

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
Sewer Master Plan Update Recommended Improvements	Oper	$ 500	$ —	0%
Bachmann Tract – Wastewater Extension	Conn-Swr	$ —	$ —	0%
Water Transmission/Wastewater Collection Reim	Conn-Wtr	$ 500	$ 354	71%
Water Transmission/Wastewater Collection Reim	Conn-Swr	$ 500	$ 520	104%
CCU Business Services Customer Software	Oper	$ 800	$ —	0%
Parkside Gertrude Avenue and Aaron Street Imp	UCPF	$ —	$ 14	0%
Parkside Olean Blvd (US 41 to Easy Street) Imp	UCPF	$ —	$ 16	0%
CHWQ – Countryman & Ackerman	Oper	$ —	$ 136	0%
CHWQ – Countryman & Ackerman	MSBU	$ 22	$ 5,168	23,491%
CHWQ – Countryman & Ackerman	Conn-Wtr	$ —	$ 23	0%
CHWQ – Countryman & Ackerman	SRF	$ —	$ —	0%
CHWQ – Countryman & Ackerman	RESTORE	$ —	$ —	0%
CHWQ – Countryman & Ackerman	R & R	$ —	$ 838	0%
CHWQ – Countryman & Ackerman	Grant Pending	$ —	$ —	0%
CHWQ – Countryman & Ackerman	Grant	$ —	$ —	0%
US 41 Southbound Utility Improvements	Oper	$ —	$ —	0%
US 41 Southbound Utility Improvements	R & R	$ —	$ —	0%
Relocation Needs Utility Pipe Replace	R & R	$ 1,742	$ 82	5%
SCADA System Upgrades	Oper	$ —	$ 211	0%
SCADA System Upgrades	Conn-Swr	$ 1,875	$ —	0%
SCADA System Upgrades	Conn-Wtr	$ 625	$ —	0%
Harbor View Road Widening – Utility Improvements	R & R	$ —	$ 9	0%
Harbor View Road Widening – Utility Improvements	Conn-Swr	$ —	$ —	0%
Harbor View Road Widening – Utility Improvements	Conn-Swr	$ —	$ —	0%
US 41 Commercial Corridor Utilities Expansion	R & R	$ —	$ —	0%
US 41 Commercial Corridor Utilities Expansion	Conn-Wtr	$ —	$ —	0%
US 41 Commercial Corridor Utilities Expansion	Conn-Swr	$ —	$ 3	0%
Lake View Midway Septic & Water Expansion	Oper	$ —	$ 455	0%
Lake View Midway Septic & Water Expansion	ST	$ —	$ —	0%

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
Burnt Store Tuckers Point Utility Infrastructure	Conn-Wtr	$ 2,000	$ 655	33%
Burnt Store Tuckers Point Utility Infrastructure	Conn-Swr	$ 1,800	$ 2,520	140%
US 41 Northbound Utility Improvements	Conn-Swr	$ —	$ —	0%
US 41 Northbound Utility Improvements	R & R	$ —	$ 2	0%
Edgewater-Flamingo Corridor Connection	Conn-Wtr	$ —	$ —	0%
Edgewater-Flamingo Corridor Connection	Conn-Swr	$ —	$ —	0%
Kings Hwy I-75 to Desoto County Line Utility Improvements	R & R	$ 846	$ 8	1%
Kings Hwy I-75 to Desoto County Line Utility Improvements	Conn-Swr	$ 212	$ —	0%
Utility Relocations and/or Improvements – FDOT Minor Projects	R & R	$ —	$ —	0%
Fiber Optic Installs for Utility Plants and Booster Stations	Oper	$ —	$ —	0%
Cape Haze Water Quality Improvement	Conn-Swr	$ —	$ —	0%
Water and Sewer Waterway Crossings	R & R	$ 100	$ 113	113%
Water and Sewer Waterway Crossings	Conn-Wtr	$ 10	$ —	0%
Water and Sewer Waterway Crossings	Conn-Swr	$ 10	$ —	0%
	Totals	**$ 19,615**	**$ 12,554**	**64%**

[1] Funding sources: BP = British Petroleum; Conn-Swr = Sewer Connection Fee Fund; Conn-Wtr = Water Connection Fee Fund; Grant = Grant Funding; MSBU = Municipal Service Benefit Unit; Oper = O & M Fund; RESTORE = Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies (Act); R&R = Renewal & Replacement Fund; ST = Sales Tax; Sinking = Sinking Fund; UCPF = Utility Capital Projects Fund.

8.1.3 CIP Projects – Reclaimed Water System

Table 8-3 lists the reclaimed water system CIP projects initiated or in progress during FY 2023. The total amount budgeted for FY 2023 was $3.9 million, and $569,000 was expended. However, this does not include expenditures for removal and replacement (R&R) of existing facilities and assets or expenditures related to new developments.

Table 8-3 Reclaimed Water System CIP Projects in Progress or Initiated in FY 2023 ($ in Thousands)

Description	Funding Source[1]	Original FY 2023 Budget	2023 Expenditures	Percent of Budget Expended
US 41 Reclaimed Water Lines	Conn-Swr	$ 150	$ 569	379%
US 41 Reclaimed Water Lines	R & R	$ —	$ —	0%
Reclaimed Water Service Connection	Conn-Swr	$ —	$ —	0%
Reclaimed Water Expansion Phase 3	Conn-Swr	$ —	$ —	0%
Reclaimed Water Expansion Phase 3	R & R	$ —	$ —	0%
Reclaimed Water Expansion Phase 3	Grant	$ —	$ —	0%
Reclaimed Water Expansion Phase 3	SRF	$ —	$ —	0%
Reclaimed Water Master Plan Recommended	Conn-Swr	$ 3,250	$ —	0%
Reclaimed Water Automated Valves	Conn-Swr	$ 500	$ —	0%
Rotonda WRF Reclaimed Water Storage Pond	Oper	$ —	$ —	0%
West Port WRF Reclaimed Water Pond	Oper	$ —	$ —	0%
	Totals	**$ 3,900**	**$ 569**	**15%**

[1] Funding sources: Conn-Swr = Sewer Connection Fee Fund; Grant = Grant Funding; Oper = O & M Fund; R&R = Renewal & Replacement Fund; SRF = State Revolving Fund.

8.1.4 CIP Projects – 6-Year Forecast

Table 8-4 summarizes the County's 6-year forecasted CIP project schedule related to CCU for water, wastewater, and reclaimed water systems. During the time of this report, CCU staff was working on a major update to the CIP/CNA schedule.

Table 8-4 Capital Improvement Program – 2023 and Future CCU Project Costs ($ in Thousands)

Project Names	Prior Years Actual	Actual FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Future Years	Total
Potable Water Master Plan	$ 643	$ 104	$ —	$ —	$ —	$ —	$ —	$ —	$ 747
Emergency Interconnect to Punta Gorda-Burnt Store	$ —	$ 1	$ 890	$ —	$ —	$ —	$ —	$ —	$ 1
Walenda Booster Station Upgrade	$ 9	$ 49	$ —	$ —	$ —	$ —	$ —	$ —	$ 58
Potable Water Master Plan Recommended Improvements	$ —	$ —	$ 1,000	$ 1,000	$ 900	$ 800	$ —	$ —	$ 3,700
Burnt Store RO WTP – Plug/ Abandon Well #15	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Campbell St to Chancellor to Myakka River 24inch Water Main	$ —	$ —	$ —	$ 2,000	$ —	$ —	$ —	$ —	$ 2,000
Toledo Blade from Hillsborough to US 41 24-inch Water Main	$ —	$ —	$ 1,000	$ —	$ —	$ —	$ —	$ —	$ 1,000
Rotonda Booster Station Upgrades	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Golf Course Booster Station Upgrades	$ —	$ —	$ 250	$ —	$ —	$ —	$ —	$ —	$ 250
Gillot Blvd Water Main Upsizing	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Potable Water Storage Tank South County	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Potable Water Elevated Tank– Mid County	$ —	$ —	$ 225	$ 4,000	$ —	$ —	$ —	$ —	$ 4,225
Potable Water Elevated Tank–West County	$ —	$ —	$ 225	$ 4,000	$ —	$ —	$ —	$ —	$ 4,225
Calumet to Robin Road – Waterway Crossing SGC to Rotonda Meadows	$ —	$ —	$ —	$ —	$ —	$ 500	$ —	$ —	$ 500
Hillsborough/Cranberry Intersection Water Main (North Port)	$ —	$ —	$ 280	$ —	$ —	$ —	$ —	$ —	$ 280
Water Meter Study Recommended Improvements	$ —	$ —	$ —	$ 4,000	$ —	$ —	$ —	$ —	$ 4,000
Major Water Transmission Lines	$ 8,042	$ 1	$ 250	$ 250	$ 250	$ 250	$ 250	$ 2,975	$ 12,268
Wastewater Force Mains Expansion	$ 5,881	$ 407	$ 600	$ 600	$ 600	$ 600	$ 600	$ 600	$ 9,888
Reclaimed Water Lines	$ 519	$ 569	$ 150	$ 150	$ 150	$ 150	$ 150	$ 1,500	$ 3,338

Project Names	Prior Years Actual	Actual FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Future Years	Total
Spring Lake MSBU Wastewater Expansion	$17,207	$ 16	$ —	$ —	$ —	$ —	$ —	$ —	$17,223
Wastewater Force Mains Replacement – Deep Creek	$ 6,768	$ 303	$ 33	$ 31	$ 31	$ 30	$ 29	$ 148	$ 7,373
Master Lift Stations	$ 452	$ —	$ 750	$ 750	$ 750	$ 750	$ 750	$750	$ 4,952
Reclaimed Connections for County Facilities	$ 49	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$49
Grand Master Lift Station and Gravity Interceptor – Loveland	$17,935	$ —	$ 167	$ 157	$ 157	$ 150	$ 150	$ 653	$19,369
Myakka River 24-inch Water Main	$ 1	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 1
Myakka Potable Water Booster Station	$ 3,106	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,106
Burnt Store Phase 2	$ 3,266	$ (11)	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,255
Charlotte Harbor Water Quality Initiative Phase 2 – EL Jobean	$ 8,375	$ 21	$ —	$ —	$ —	$ —	$ —	$ —	$ 8,396
Burnt Store WRF Expansion	$ 3,304	$ 136	$ 6	$ 6	$ 5	$ 273	$ 267	$ 5,143	$ 9,140
East Port WRF Expansion	$ 2,293	$ 113	$ 5	$ 4	$ 199	$ 380	$ 380	$ 3,181	$ 6,555
Cape Haze Sewer & Reclaim Transmission System	$ 2,107	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 2,107
Charlotte Harbor Water Quality Project Septic to Sewer	$ —	$ —	$ 3,841	$ —	$ —	$ —	$ —	$ —	$ 3,841
CMOM Recommended Utility Improvements	$ —	$ —	$ 3,000	$ 500	$ 500	$ —	$ —	$ —	$ 4,000
Wastewater Force Main SR 776 Sunnybrook to Gasparilla CR 771	$ —	$ 27	$ 19	$ —	$ —	$ —	$ —	$ —	$ 46
Reclaimed Water Master Plan Recommended	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Reclaimed Automated Valves	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Odor Control System for Midway Boulevard & Loveland Boulevard	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Rotonda WRF Reclaimed Storage Pond	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —

Project Names	Prior Years Actual	Actual FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Future Years	Total
West Port WRF Reclaimed Water Pond	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
East Port WRF Wetwell Cover and Ozone System	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
West Port WRF Perimeter Fencing (Homeland Security)	$ 445	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 445
East Port WRF Deep Well Supply Line	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Veterans Wastewater Force Main US 41 to Peachland	$ —	$ —	$ —	$ —	$ 800	$ 3,492	$ —	$ —	$ 4,292
East Port WRF Equalization System	$ —	$ —	$ —	$ 2,000	$ 2,000	$ —	$ —	$ —	$ 4,000
Olean Blvd. Force Main – Easy Street to Loveland	$ —	$ —	$ —	$ 5,000	$ —	$ —	$ —	$ —	$ 5,000
West Port WRF Expansion 1.2- to 3-MGD (Including Equalization)	$ —	$ 423	$ —	$ 49,976	$ —	$ —	$ —	$ —	$ 50,399
West Port WRF Deep Injection Well Capacity Increase	$ —	$ —	$ 1,000	$ —	$ —	$ —	$ —	$ —	$ 1,000
Replace Filters at East Port WRF Stage 5	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Safety Improvements at Vacuum Pump Stations	$ —	$ —	$ —	$ 200	$ —	$ —	$ —	$ —	$ 200
Sewer Master Plan Update Recommended Improvements	$ —	$ —	$ 1,000	$ 500	$ 500	$ —	$ —	$ —	$ 2,000
Bachmann Tract – Wastewater Extension	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Water Transmission/Wastewater Collection Reimbursement	$ 814	$ 874	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 3,000	$ 9,688
CCU Business Services Customer Billing and Database	$ 1,531	$ —	$ 800	$ 800	$ 800	$ 800	$ 800	$ 800	$ 6331
Parkside – Gertrude and Aaron Street Improvements	$ 3,143	$ 14	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,157
Parkside – Olean Boulevard (US 41 to Easy Street) Improvements	$ —	$ 16	$ —	$ —	$ —	$ —	$ —	$ —	$ 16
Central County Infrastructure	$ 8,354	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 8,354

Project Names	Prior Years Actual	Actual FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Future Years	Total
Charlotte Harbor Water Quality Initiative Phase 2 – Countryman & Ackerman	$ 12,993	$ 6,165	$ 21	$ 20	$ 19	$ 18	$ 17	$ 124	$ 19,377
Utility Equipment Replacements	$ 193	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 193
US 41 Southbound Utility Improvements	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Relocation Needs Utility Pipe Replacement	$ 331	$ 82	$ 1,742	$ 1,742	$1,742	$1,742	$1,742	$ 1,742	$ 10,865
SCADA System Upgrades	$ 893	$ 211	$ 1,500	$ 1,000	$ —	$ —	$ —	$ —	$ 3,604
Harbor View Road Widening – Utility	$ 1	$ 9	$ —	$ 13,125	$ —	$ —	$ —	$ —	$ 13,135
US 41 Commercial Corridor Utilities Expansion	$ 78	$ 3	$ —	$ —	$ —	$ —	$ —	$ —	$ 81
Lake View Midway Septic & Water Expansion	$ 209	$ 455	$ 63,555	$ —	$ —	$ —	$ —	$ —	$ 64,219
Burnt Store Tuckers Point Utility Infrastructure	$ —	$ 3,175	$ —	$ —	$ —	$ —	$ —	$ —	$ 3,175
US 41 Northbound Utility Improvements	$ —	$ 2	$ —	$ 10,500	$ —	$ —	$ —	$ —	$10,502
Edgewater-Flamingo Corridor Connection	$ —	$ —	$ —	$ —	$ —	$ 19,200	$ —	$ 9,200	$ 28,400
Kings Hwy I-75 to Desoto County Line Utility Improvements	$ —	$ 8	$ —	$ —	$ —	$ —	$ —	$ —	$ 8
Utility Relocations and/or Improvements – FDOT Minor Projects	$ —	$ —	$ 1,200	$ 1,150	$ —	$ —	$ —	$ —	$ 2,350
Fiber Optic Installs for Utility Plants and Booster Stations	$ —	$ —	$ —	$ 737	$ 737	$ —	$ —	$ —	$ 1,474
Cape Haze Water Quality Improvement	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Waterway Crossings for Public Works (Water & Sewer)	$ 4,942	$ 113	$ —	$ —	$ —	$ —	$ —	$ —	$ 5,055
Totals	**$118,610**	**$13,278**	**$83,600**	**$105,198**	**$11,140**	**$30,135**	**$6,135**	**$29,816**	**$397,912**

8.2 Review of Design, Reports, and Studies

The following describes reports and studies prepared by CCU Engineering or submitted by external engineering consultants in FY 2023. Prior year reports and annual reoccurring reports are also included for reference.

8.2.1 Reports Completed in FY 2023

- CCU 2022 Annual Report, Jones Edmunds, March 2023.
- CCU Modeling Tasks, Jones Edmunds, Ongoing:
    - Tuckers Pointe Development – Water and Wastewater
    - Simple Life Development – Water and Reclaimed Water
    - Edgewater Drive/Flamingo Boulevard Main Sizing – Water, Wastewater, and Reclaimed Water
    - Cattledock Pointe Valve Station – Reclaimed Water
    - SR 776 Main Sizing – Wastewater
    - Harbor Village Development – Water, Wastewater, and Reclaimed Water
    - Starling Development – Water, Wastewater, and Reclaimed Water
    - The Cove Development – Water, Wastewater, and Reclaimed Water
- CMOM Program, Kimley-Horn, 2023.
- CAAP and Flow Monitoring Program, Veith Engineering and Hazen & Sawyer, ongoing.

8.2.2 Reports Completed in FY 2022

- CCU 2021 Annual Report, Jones Edmunds, March 2022.
- East Port WRF Permit Renewal and Application and Authorization for Substantial Modification, Jones Edmunds, November 2022. The application included multiple supplemental reports for continued operations and expansion of the East Port WRF.
- Burnt Store WRF Permit Renewal Application and Authorization for Substantial Modifications, Jones Edmunds, July 2021 and revised March 2022. The application included adding Advanced Wastewater Treatment to the Burnt Store WRF expansion.
- Lake View – Midway Water Quality Improvements Preliminary Design Report, Giffels-Webster Engineers Inc., September 2022, First Revision November 2022, Second and Final Revision January 2023.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- El Jobean Sewer Expansion Charlotte County, Florida Final Report FDEP Agreement No. NF063 October 2022 – CCU completed a final report to meet the compliance criteria for sewer connections in El Jobean that were partially funded by EPA through an agreement/contract with the Nonpoint Source Management Program of the FDEP.
- Preliminary Engineering Report Green Dolphin Drive Water Main Project # 22-0005, July 6, 2022 – CCU completed a report to provide the most cost-effective and feasible option for replacing a disabled potable water main. The proposed project will provide a redundant connection to the island area.

8.2.3 Reports Completed in FY 2021

- CCU 2020 Annual Report, Jones Edmunds, March 2021.
- Unaccounted Water Investigation for the Burnt Store Service Area, Jones Edmunds, January 2021.
- Burnt Store WRF Permit Renewal Application and Authorization for Substantial Modifications, Jones Edmunds, July 2021. The application included multiple supplemental reports for continued operations and expansion of the Burnt Store WRF.
- CCU Security Risk Assessment Report, CTCH Security Business Consulting LLC, April 2021.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- Technical Memorandum Regional Transmission System, Interceptor and Grand Master Lift Station Impacts on Connected Lift Stations – WO #22, Jones Edmunds, February 24, 2021. The memorandum evaluated the impacts on the regional transmission system and lift stations due to the interceptor and grand master lift station project. Pump selections and other lift station improvements were identified through hydraulic modeling and analysis as a result of the significant change to the regional transmission system.

8.2.4 Reports Completed in FY 2020

- Facilities Quarterly Reports, Stantec, 2020 – The quarterly update reports are based on DMRs and flow information provided to Stantec monthly. The quarterly report highlights upcoming permit requirements and includes a completion schedule for required permit tasks.
- Manchester Waterway Boat Lock Removal Plan Annual Report – CCU completed an annual compliance report on the status of sewer connections in the Alligator Drainage Basin area to satisfy a Net Ecosystem Benefit requirement in accordance with FDEP Permit No. 08-0210682-001.
- CCU 2019 Annual Report, Jones Edmunds, March 2020 – The annual report is conducted to provide the public with a utilities status update and to fulfill Revenue Bonds requirements for CCU.
- CCU SCADA Master Plan – McKim & Creed, March 2020 – The primary goal of this plan is to define and document a road map for the implementation of the technology, practices, and organization required to meet CCU's short-term goals and long-term vision for SCADA.
- Water Systems Risk and Resilience Assessment, Jones Edmunds, March 2020 – An RRA was completed on the utilities water systems in fulfillment of the America's Water Infrastructure Act of 2018 (AWIA) requirements that must be completed every 5 years.
- CCU Emergency Response Plan, Jones Edmunds, September 2020 – CCU's ERP was updated to reflect the findings of the RRA and to fulfill AWIA requirements.
- Charlotte County Cyber Security Audit (2020) – In December 2020, McKim & Creed, in association with CrimsonResolve, completed the first cybersecurity audit of the Charlotte County SCADA system. The report assessed the County's cybersecurity components to fulfill AWIA requirements.
- East Port WRF IW-2 Operating Permit Renewal Application, Stantec, January 2020. – The report and application renewal were prepared to continue operations of the East Port IW.

- East Port WRF IW-2 Mechanical Integrity Test Report, Stantec, July 2020. – The MIT test and report were prepared to fulfill the FDEP UIC permit requirements, which must be completed every 5 years.
- West Port WRF IW-1 Operating Permit Renewal Application, Stantec, January 2020.
- West Port WRF IW-1 Mechanical Integrity Test Report, Stantec, June 2020.

9 UTILITY SUPPORT SERVICES

9.1 STATE-CERTIFIED LABORATORY

The East Port Laboratory (EPLAB) is a part of CCU and is at the East Port WRF. EPLAB provides regulatory and operational support for CCU facilities including four WRFs, one WTP, one LTF, six deep injection wells, and the potable water distribution systems. EPLAB is a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory (Florida Department of Health [FDOH] ID E54436, which was renewed July 1, 2023, and reissued for EPA Method Update Rule in September 2022) and a member of the National Environmental Laboratory Accreditation Conference (NELAC) Institute (TNI). The current EPLAB staff includes the Laboratory Manager, Laboratory Quality Assurance Specialist (QAS), and four additional laboratory support personnel (laboratory technicians). The laboratory accreditations include performing analyses for potable water microbiology, non-potable water general chemistry, and non-potable water microbiology.

9.1.1 ACCREDITATION AND CERTIFICATIONS

EPLAB operates in compliance with the 2016 Environmental Laboratory Sector Standards set by TNI and in accordance with Chapter 64E-1, FAC (Certification of Environmental Testing Laboratories), FDEP Quality Assurance requirements (Chapter 62-160, FAC), and FDOH Environmental Laboratory Certification requirements. As required by current TNI standards and FDEP regulations, the EPLAB must assess laboratory operations every 2 years, conduct annual management reviews, and perform proficiency tests every 6 months as a part of the continuing certification process. All laboratory personnel are required to obtain certification to perform specific analyses in the laboratory including documentation of Initial and Continuing Demonstrations of Capability (IDOC/CDOC) and analysis of Proficiency Testing samples. Results from the test samples are sent to FDOH for regulation compliance and compared to results from other laboratories nationwide. EPLAB staff typically excel at proficiency tests usually passing within two standard deviations of the national average. The frequency of reviews, tests, and audits conducted at the EPLAB and required for maintaining certifications and CCU goals are listed herein:

- The Laboratory Manager performs a Management Review of the EPLAB quality system and environmental testing activities each year, as required by the TNI Standards.
- An engineering consultant performs an operations review of the EPLAB annually.
- FDOH requires a laboratory audit every 2 years. The most recent biannual FDOH assessment was conducted by a private company under contract with FDOH. It was scheduled for October 2022, but was postponed and conducted in November 2022 because of Hurricane Ian.
- Proficiency tests are conducted semi-annually, typically in August and February.
- Internal audits are completed periodically for ensuring system quality.

Table 9-1 lists the current certifications of the EPLAB, which are renewed July 1 each year.

Table 9-1 Laboratory Certifications

Analyte	Method/Tech	Category	Matrix
Escherichia Coli	SM 9223 B	Microbiology	Drinking Water
Total Coliforms	SM 9223 B	Microbiology	Drinking Water
Ammonia as N	EPA 350.1	General Chemistry	Non-potable Water
Ammonia as N	SM 4500-NH3 D-2011	General Chemistry	Non-potable Water
Biochemical Oxygen Demand (BOD)	SM 5210 B-2016	General Chemistry	Non-potable Water
Carbonaceous BOD (CBOD)	SM 5210 B-2016	General Chemistry	Non-potable Water
Chloride	SM 4500-Cl^- E-2011	General Chemistry	Non-potable Water
Conductivity	EPA 120.1	General Chemistry	Non-potable Water
Enterococci	ENTEROLERT /QUANTI-TRAY	Microbiology	Non-potable Water
Fecal Coliforms	COLILERT®-18	Microbiology	Non-potable Water
Fecal Coliforms	SM 9222 D-2015	Microbiology	Non-potable Water
Kjeldahl Nitrogen – Total	EPA 351.2	General Chemistry	Non-potable Water
Nitrate as N	EPA 353.2	General Chemistry	Non-potable Water
Nitrate as N	SM 4500-NO3 H-2016	General Chemistry	Non-potable Water
Nitrite	SM 4500-NO2-B-2011	General Chemistry	Non-potable Water
Nitrite as N	EPA 353.2	General Chemistry	Non-potable Water
Phosphorus, Total	EPA 365.4	General Chemistry	Non-potable Water
Residue-Filterable (TDS)	SM 2540 C-2015	General Chemistry	Non-potable Water
Residue-Nonfilterable (TSS)	SM 2540 D-2015	General Chemistry	Non-potable Water
Sulfate	ASTM D516-16	General Chemistry	Non-potable Water
Total Nitrate-Nitrite	EPA 353.2	General Chemistry	Non-potable Water
Total Nitrate-Nitrite	SM 4500-NO3 H-2016	General Chemistry	Non-potable Water

Note: ASTM = American Society for Testing and Materials; SM = Standard Method.

9.1.2 Quality Assurance and Quality Control

The EPLAB has implemented a robust quality system that encompasses Quality Assurance (QA) and Quality Control (QC) activities. The EPLAB staff maintain a comprehensive guidance document, referred to as the *Quality Manual*, to document the processes and steps of QA/QC. The EPLAB Quality Manual was revised on January 1, 2024, to include corrective actions implemented because of the November 2022 FDOH audit; the revised version (3.9) has been effective since January 1, 2024.

The document contains 28 sections, including organization, document control, purchasing services and supplies, client service, control of records, data integrity, environmental conditions, calibration, sample handling, quality assurance, and reporting methods. TNI standards are referenced for each section of the Quality Manual, which allows for quick reference between this local document and the TNI standards. In addition, staff have also developed in-house standard operating procedures (SOPs) for select tasks. The SOPs are maintained and revised annually to coincide with new TNI standards in accordance with FDOH's Environmental Laboratory Program. Hardcopies of the most current Quality Manual and SOPs are readily available to EPLAB staff in the laboratory. A Master List of all documents currently in use in the laboratory including effective date, revision number, and location is maintained by the QAS.

QA procedures are well documented, and all laboratory personnel have received documented training on all quality assurance/control protocols. Chain-of-custody documentation is strictly adhered to during sample receipt and handling. Laboratory equipment is tested for accuracy in accordance with the Quality Manual. Samples are arranged efficiently for analysis by batches to reduce the numbers of blanks, calibration standards, and QC samples needed per analysis.

Electronic entry of data at the laboratory station or output of an automatic analyzer directly to report forms has eliminated one source of potential errors. Organization of data in an electronic format would allow direct input into FDEP forms, which would eliminate another source of data entry error. Currently, FDEP water quality forms are not compatible with LIMS. The FDEP forms are expected to be updated. QA by a responsible person-in-charge is required to check hand-entered data entries. All data are reviewed and approved by the Laboratory Manager or QAS before being released to the client or FDEP. Laboratory results from the outside laboratories are received, reviewed, and forwarded to the WTP and WRF Chief Operators for use in compliance reporting.

9.1.3 Record Keeping

The Quality Assurance Manual and SOPs are kept in a neat and organized manner and are easily accessible to all laboratory personnel. Safety Data Sheets (SDSs) required by the Hazard Communication Standard (29 CFR 1910.1200(g)) are available for all chemicals used in the laboratory. Copies of FDOH certifications for the outside laboratories are maintained by the QAS. Personnel records, including documentation of training and IDOC/CDOC, are maintained by the Laboratory Manager and QAS. All sample data are cross-referenced to sampling information, standards and reagent information, and analysis logbooks using chain-of-custody and the assigned unique sample ID. Electronic data are backed up daily, and historical data are archived on an external hard-drive. Paper and electronic records are well maintained to meet regulatory requirements. Sampling schedules for each facility are clearly posted for staff to review, and all upcoming special sampling events (e.g., Annual Effluent Analysis, Cryptosporidium, and Giardia) are clearly posted with their due dates. Sample receiving and documentation procedures have been upgraded to be fully electronic, but the chain of custody is managed and tracked by hard copy.

9.1.4 Data Management

The laboratory uses the EthoSoft web-based X-LIMS (Laboratory Information Management System) for data management. The LIMS software is used to prepare paper documentation forms and to assign unique sample identification numbers to samples for recording and tracking results. The LIMS can be used to track samples through the storage, analysis, and reporting phases, reducing the possibility of error. The Laboratory Manager can produce daily status reports of all current laboratory work through LIMS. The LIMS is also capable of monitoring quality control results and chemical use to manage supplies ordering. The laboratory continually reviews and manages the inventory. A hardcopy tracking system, developed by the Laboratory Manager, is also used in conjunction with LIMS for those analytes not suited to electronic tracking. Data in the LIMS and on all computers used in the laboratory

are backed-up daily by the County's IT Department and to the EthoSoft off-site server ("the Cloud"). All analytical data are also downloaded annually by the QAS onto an external hard drive for long-term storage.

9.1.5 Laboratory Operations and Site Visit

Jones Edmunds staff visited the EPLAB on February 1, 2024, and met with the Laboratory Manager, Sandra Lavoie, to discuss operations in FY 2023. The Laboratory Manager reviews the WRF's permits, provides operators with pre-labeled sampling bottles, and coordinates sampling events to account for the lab's staffing and analytical capabilities, sample holding times, and water quality compliance schedules. During FY 2023, the EPLAB received 8,520 samples and conducted 32,714 analyses. EPLAB sends some samples to outside laboratories that are certified to perform tests that EPLAB is not certified to perform. The EPLAB used external laboratories to process an additional 5,303 analyses for a total of 38,017 analyses.

The Laboratory Manager indicated that the increase in sample load was due to the continuing long-term monitoring program for Spring Lake that includes eight wells and two channels of sampling that began in early 2020 for the East Port and Burnt Store WRFs. The number of samples and analyses required from the laboratory is expected to increase with the future AWT upgrades to the WRFs, requiring frequent sampling of total phosphorus, which is a labor-extensive process due to the digestion steps. The laboratory has been using an automatic analyzer (received last fiscal year) that will increase reliability (using the old analyzer as a backup) and sampling capabilities.

The following reviews, tests, reports, and trainings were completed in FY 2023:

- The annual Management Review of the EPLAB quality system and environmental testing activities was submitted in 2023.
- The EPLAB participated in and passed two TNI/FDOH-mandated Proficiency Testing studies (in February 2023 and August 2023). Staff achieved a score of 100 percent. The next set of proficiency testing is scheduled for the first quarter in 2024. EPLAB is waiting to receive the tests and will begin with this testing in February 2024.
- The Quality Integrity System Report was completed in December 2023.
- The annual Ethics and Data Integrity training for all laboratory staff in the EPLAB was completed in August 2023.

The EPLAB workspace consists of five main rooms:

- Sample receiving and storage.
- Un-refrigerated chemicals and equipment storage.
- Administrative workstations for laboratory technicians.
- Main laboratory benches.
- Drinking water laboratory.

No deficiencies were noted by Jones Edmunds during the February 2023 laboratory site visit. The areas are kept clean and orderly, and staff does an excellent job of maintaining the workspaces. Review of internal laboratory documentation indicates that all IDOC/CDOC records are complete and up to date, SOPs for all certified methods were reviewed and revised (as needed) during FY 2023, and all laboratory staff received appropriate quality assurance,

SOP, and data integrity training. As noted by the Laboratory QAS, the laboratory staff continues to demonstrate their diligence in ensuring all laboratory data entries, chain-of-custody forms, bench sheets, etc., are correctly transferred to the final laboratory analysis report, which is used for reporting to regulatory agencies.

Table 9-2 summarizes the previous years' recommendations and provides a progress update for reference. Recommendations for this year's report are included in Chapter 10.

9.1.6 Review of Previous Report Recommendations

Table 9-2 CCU EPLAB FY 2022 Recommendations and Status

Recommendation:	Continue implementation of the LIMS system. Evaluate hiring IT support that can work exclusively on the set-up and implementation of the LIMS or purchase a service package from the vendor to do the set-up of laboratory-specific forms and reports with remote installation.
Progress:	Although some progress has been made in the LIMS implementation, time constraints on laboratory personnel due to sample load as well as instrument integration issues appear to have slowed progress. IT support or vendor technical support is being coordinated.
Recommendation:	Evaluate staffing requirements and the ability to provide sampling services. The Laboratory Manager indicated that the EPLAB may be taking over field sampling services since current field samplers are changing departments and duties and will no longer be available to collect and/or transport samples. This includes spill sampling, water-quality sampling, groundwater sampling, surface water sampling, miscellaneous sampling, and sample transport. Current laboratory staffing does not appear to be appropriate for the expected analytical workload for FY 2023. Adding sampling services may require at least one additional EPLAB staff member.
Progress:	Field sampling services were stopped in FY 2022, and an additional laboratory technician position was filled in FY 2023.
Recommendation:	Update personnel on new sampling procedures including the need for accuracy in use of collection bottles, sample storage, and delivery to the laboratory.
Progress:	Recurring. EPLAB has had meetings to continue to improve and keeping personnel updated.
Recommendation:	Recommend seeking certification for potable water TDS and Sulfate.
Progress:	Laboratory Manager noted that this recommendation is not needed.
Recommendation:	Investigate the benefit of purchasing analytical equipment to process additional sampling required for the AWT upgrades at the WRFs and to increase the frequency of analysis for BOD, TSS, TN, and TP at East Port WRF.
Progress:	Ongoing. The EPLAB staff have been studying the requirements and the sampling and testing that will be necessary.

9.2 ASSET MANAGEMENT

Asset management is the practice of managing capital assets to minimize cost of operations to owners and establish individual level(s) of service to be delivered. Asset management plans are developed as a tool to record all the owner's asset management practices and strategies. Typically, an EAMS such as Cityworks is used to manage asset data.

According to the *Reference Guide for Asset Management Tools* (June 2020), EPA has identified that an Asset Management Plan (AMP) should include the following components:

- Introduction – Identifies goals, strategic plan, mission statement, and other relevant background information.
- Staff Information – Identifies system staffing structure and asset management team. Includes stakeholder education and outreach.
- Level of Service – Defines the system operation and expectations for customer service delivery.
- Asset Inventory – Identifies and evaluates system assets. Includes evaluation of criticality, probability/consequence of failure, and remaining useful life.
- Operation and Maintenance – Identifies and tracks applicable operating procedures and required maintenance routines.
- Capital Improvements – Identifies short- and long-term asset rehabilitation and replacement projects based on Asset Inventory and O&M data.
- Financial Strategy – Determines if system revenue(s) will be adequate to fund current and future O&M and Capital Improvements. This component reasonably ensures the desired LOS is economically feasible.
- Compliance – Identifies and tracks requirements for system compliance with respect to federal and state guidelines.
- Preparedness – Identifies emergency procedures to maintain system operations such as emergency power backup.

The EPA Reference Guide also identifies the following as additional components that may be included to increase the value and effectiveness of an AMP, although they are not noted as required: energy management, water efficiency, climate change, regional planning, and multi-sector asset management.

CCU does not currently have an AMP; however, over recent years the BCC has taken a forward approach in continuing to develop its Strategic Plan. The Charlotte County Strategic Plan is updated every fiscal year and includes goals, initiatives, and highlighted past achievements for identified "strategic focus areas." In 2020, the BCC streamlined the Strategic Plan by narrowing the number of focus areas from nine to four. The current Strategic Plan focus areas are described as follows:

- Public Services – To maintain a safe and healthy community by delivering essential services from skilled, professional, and dedicated public servants.
- Economic and Community Development – To create a business climate that promotes a diversified, growing economy consistent with sustainable growth management plans, environmental stewardship, and enhanced quality of life.

- Infrastructure – To build and maintain countywide infrastructure that meets our evolving needs and enhances our community appearance, improves public safety, and protects our natural resources.
- Efficient and Effective Government – To manage fiscally sound county operations with a culture of transparency, accountability, citizen engagement and innovation.

In 2020, Charlotte County retained Jones Edmunds to implement Cityworks EAMS in support of the County's Strategic Plan. Cityworks EAMS will be used to standardize the work and asset tracking process in a robust system with capabilities to schedule routine maintenance and tasks, identify and track hot spots and issues with infrastructure, and report on key performance indicators across County Departments. Initially, Cityworks will be implemented in the Utilities, Facilities, and Public Works Departments.

As part of these efforts, Jones Edmunds and CCU began with a review of current GIS data, as Cityworks is built on the spatial data for assets in the system. The Jones Edmunds team recommended GIS database schema edits to bring the data in conformance with industry standards as well as adding the necessary fields for Cityworks use. Part of the scope included development of a vertical asset schema for the CCU plants, which organizes specific plant assets into database tables that are then related to the physical plant location or room where they reside, which is then captured spatially within the GIS. Polygons for plant process areas were created as part of this project for this purpose. The GIS data was published to the database to be used by Cityworks and will become the database of record for all work done within the County.

Jones Edmunds met with the various groups within CCU including Water Distribution, Wastewater Collection, Engineering, Reclaimed Water, Treatment Facilities, and Instrumentation and Control to learn about current workflow processes and work that is done on the CCU assets (scheduled and routine maintenance, emergency maintenance asset replacement, etc.). These meetings, combined with the 2018 departmental work process evaluation performed by LA Consulting, assist in configuring Cityworks to capture the work and needed information for the EAMS. Configuration includes the elements of:

- Domain and Groups set up to determine how information can be shared across department boundaries.
- GIS configuration and Map Development specifically configured for CCU staff to use in the field.
- Work Orders, which will reflect activities performed.
- Service Requests, which will capture internal and external requests for information on the CCU assets.
- Inspections, which will hold custom questions and information routinely checked for assets in the system.
- Crews, which provides efficient association of costs to each Work Order.
- Projects, to streamline activity tracking.

- Inboxes, which will support the major workflow activity tracking for each department.
- Dashboards and Reporting, which will employ both out-of-the-box and custom reports for data analysis and data mining.
- Storeroom, the Cityworks warehousing add-on that tracks materials influx, use and stock on hand. Different Storerooms will be set up for the CCU Storerooms as well as each of the trucks and their rolling stock.

The effort also includes integration with two global and three utilities-specific software packages in use at the County. Eden integration has been completed and will allow for an up-to-date employee record for assigning work in Cityworks. PublicStuff will soon be connected to Cityworks such that a complaint filed by a citizen or entered via a call center will result in a Service Request assignment within Cityworks for one of the CCU departments as applicable. An integration with Banner, the customer information system, will be designed to cut down on duplication of work entered between the two systems. An integration with SCADA will allow the creation of Work Orders based on alarms and equipment run times. Finally, the effort will integrate Cityworks with GraniteNET so that the County can more easily pass information between Cityworks and the CCTV pipe inspection system.

Full implementation was completed in FY 2023 and is currently live for CCU. be trained and will spend time doing User Acceptance Testing. Following a testing period, the system can be tweaked with necessary adjustments to accommodate needs of CCU, then the remainder of Cityworks users will be trained on the updated system. Setup of the Cityworks add-on Performance Budgeting will follow go-live for users. This is the facet of Cityworks that will assist with planning and budgeting for future fiscal years, as well as the ability to compare planned effort versus actual effort across departments. The County is currently collaborating with Jones Edmunds to refine the Cityworks program for better use by County staff, including completing several additional training sessions with Jones Edmunds staff.

9.3 Operation and Information Technology

CCU operates facilities 24 hours per day, 365 days per year, to provide safe drinking water for Charlotte County while collecting and treating wastewater so it can be distributed for beneficial re-use by reclaimed water customers. An integral part of daily operations involves monitoring and controlling facilities using the SCADA system, either on site or remotely; many smaller facilities such as lift stations are primarily operated remotely. Of equal importance is the Utility's ability to concurrently operate the numerous processes involved. Automation of these tasks, as for most cases in the CCU system, allow CCU to deliver their utility services at the lowest feasible cost to the customer. However, automated systems are more susceptible to network threats, so cybersecurity should be considered and evaluated as a forefront issue for every SCADA or network improvement.

The existing CCU utility systems include many acquired assets. Several facilities represent multiple projects involving different engineers, bid contractors, and SCADA system integrators. This has resulted in a SCADA system of mixed hardware, software, and architectures that includes diverse and separate operations. Supporting and maintaining information for sharing and use can become problematic even for the most basic operations. CCU completed the SCADA Master Plan (McKim & Creed, March 2020) to improve this situation with a goal of standardizing hardware and software platforms and improving the overall system operations.

The primary goal of the SCADA Master Plan was to define and document a road map for the implementation of the technology, practices, and organization required to meet CCU's short-term goals and long-term vision for SCADA.

CCU's short-term SCADA goals include:

- Assess CCU's current SCADA infrastructure.
- Identify equipment and systems that are inefficient, aging, or obsolete.
- Evaluate the best, most cost-effective options for improvements for equipment, communications, and software.
- Recommend standards for equipment, communications, and software.
- Identify and cost projects to implement these goals.

CCU's long-term SCADA goals include:

- Bring all services onto a common SCADA platform to be shared throughout CCU.
- Provide a central location to monitor all CCU operations during non-business hours and during weather emergencies.
- Expand SCADA services to supplement future utility service expansions in the most efficient manner.
- Provide management with timely operational data to better monitor and optimize operations.
- Provide SCADA data to integrate with other County software packages, such as the new EAMS.

These goals were used in the SCADA Master Plan to develop recommendations to incorporate into CCU's current and future planning, CIP, and O&M programs. Many improvements are inter-related. Specific recommendations from the SCADA Master Plan are included in Chapter 10 and are summarized as follows:

- Conduct a cybersecurity audit of the SCADA system to assess the vulnerability of the system and prepare for AWIA compliance.
- Establish and implement new CCU standards for software, equipment, and communications. These standards will help minimize the number of platforms in use by CCU, reducing the investment in spare parts and the training requirements as well as improving the knowledge and efficiency of the maintenance staff. This will also allow CCU to better manage and control future SCADA project implementations.
- Define and implement new policies and procedures for changes in management, contingency, and disaster recovery.

- Migrate from the two SCADA software platforms currently in use at CCU to a single SCADA platform provided by Trihedral's VTScada. CCU began converting to VTScada in 2021 and should continue to implement VTScada in accordance with the SCADA Master Plan.
- Upgrade the control systems equipment at CCU major facilities as outlined in the SCADA Master Plan. Some of this work can be accomplished as stand-alone projects and other work can be implemented as part of planned CIP projects.
- Work with the County IT Department to expand the County's fiber optic network to include all major CCU facilities, specifically the Rotonda WRF and Burnt Store facilities. Expansion to include smaller facilities (existing and future) should be included as it is deemed cost-effective. This effort is currently ongoing.
- Establish a Central Command Center at the East Port WRF. The Central Command Center would give CCU greater day-to-day operational flexibility and would provide monitoring and control of remote facilities during an extreme weather event.
- Integrate the new SCADA system with other CCU systems such as LIMS, EAMS, and GIS. This integration will decrease manual data entry and related errors, increase efficiency and automation of the process, and provide an infrastructure to apply analytics and artificial intelligence.

10 CONSOLIDATED RECOMMENDATIONS

10.1 PLANNING RECOMMENDATIONS

Table 10-1 through Table 10-7 summarize the Planning Recommendations from the FY 2023 Annual Report. The recommendations have been compiled from each chapter and summarized for each CCU workgroup.

In general, CCU should continue planning for repairs of facilities and assets from damage due to Hurricane Ian, as documented by the FEMA assessments conducted in November 2022 by Jones Edmunds, Kimley-Horn, and HDR.

10.1.1 ADMINISTRATIVE

Table 10-1 Administration Planning Recommendations

Recommendation:	Continue CCU's vision to ensure safe, reliable utility services at fair and reasonable rates.
Recommendation:	Continue developing and updating standards for water and sewer construction to ensure the most effective use of capital improvement funds.
Recommendation:	Continue developing options for water, sewer, and reclaimed water service in the County to meet a growing demand for municipal utility services.
Recommendation:	Continue developing the Utilities' Information System functions to update/replace software and computer equipment to increase operating efficiencies and cost savings.
Recommendation:	Continue exploring regional solutions to water and wastewater service needs for the mutual benefit of Charlotte County and adjoining counties and cities.
Recommendation:	Verify that Murdock Building meets Category 3 or higher building standards.[1]
Recommendation:	Continue to document planned and proposed developments to assist with future planning.
Recommendation:	Continue to pursue FEMA funding for rehabilitation of utility assets damaged by Hurricane Ian.
Recommendation:	Continue to evaluate the feasibility of rehabilitating the damaged Administration Building.
Recommendation:	Develop/update the Business Continuity Plan.[1]
Recommendation:	Become a member of an intrastate mutual aid and assistance program.[1]
Recommendation:	Remove USB port slots from select desktops to limit the vulnerability of the SCADA system.[1]
Recommendation:	Develop a cybersecurity culture through training and internal programs.[1]
Recommendation:	Require equipment vendors for HMI, field controllers, field devices, etc., and software suppliers for data management to provide information on cybersecurity and updates for their products.[1]

Recommendation:	Weigh the options for automation in future designs to consider cyber threats and include manual components where applicable to increase infrastructure resilience.[1]
Recommendation:	Continue to develop and host public education events to educate the community on the benefits water of reclaimed water.

[1] Recommendation from the RRA Report (March 2020).

10.1.2 Water Treatment Plants

Table 10-2 Water Treatment Planning Recommendations

Recommendation:	Develop a wildfire ERP, identify fire hydrant locations, and coordinate with Fire Department for trainings for critical assets.[1]
Recommendation:	Update the ERP for pipe failure for all critical assets.[1]
Recommendation:	Identify a backup chemical and fuel supplier in the event of a chemical or fuel shortage.[1]
Recommendation:	Develop an ERP for operating without the support of SCADA.[1]
Recommendation:	Develop a procedure and obtain the equipment for transporting key chemicals (fuel and chlorine) from one site to another if required in an emergency.[1]
Recommendation:	Link contamination detection to SCADA to immediately shut down or lockout any pump in operation.[1]
Recommendation:	Evaluate installation of monitors in operators' offices in operations building for improved security surveillance.
Recommendation:	Continue evaluating and planning for transition from sodium hypochlorite to chloramine.
Recommendation:	Complete evaluation to determine remaining membrane life for Trains A through E and develop a membrane replacement schedule to meet short- and long-term demands for the growing community.
Recommendation:	Evaluate the feasibility of constructing a new water treatment plant to treat water from the Babcock Ranch Wellfield.
Recommendation:	Continue to coordinate with the Authority to better determine available Authority future capacity and reserve additional capacity, as needed based on CCU's projected future flows.

[1] Recommendation from RRA Report (March 2020).

10.1.3 Water Distribution System

Table 10-3 Water Distribution Planning Recommendations

Recommendation:	Continue to update the water system hydraulic computer models and use them as planning tools for future water system improvements.
Recommendation:	Continue the AMI Water Meter Replacement Program.
Recommendation:	Continue to integrate acquired utilities into the overall CCU water system to maximize reliability and reduce costs to CCU customers.
Recommendation:	Continue to make improvements at the water storage tank/booster pumping station facilities to increase reliability and control of the pumps to improve water distribution to customers.

Recommendation:	Continue to develop and update water quality models for each distribution system for use in ongoing development reviews.
Recommendation:	Develop a systemwide hydrant flushing program.
Recommendation:	Develop a program to identify and track asbestos and lead pipe.
Recommendation:	Develop a systemwide valve exercise program.
Recommendation:	Develop a best management practice plan to standardize pump and motor sizing across CCU pumping facilities to better facilitate maintenance and replacement of equipment.
Recommendation:	Develop an equipment calibration program for purposes of tracking and calibrating water system analyzers, flow meters, and applicable devices.

10.1.4 Wastewater Collection System

Table 10-4 Wastewater Collection System Planning Recommendations

Recommendation:	Continue the scheduled repair of sanitary lift stations that have deteriorated due to age and hydrogen sulfide presence.
Recommendation:	Complete recommendations from CCU's capacity, management, operations, and maintenance (CMOM) program.
Recommendation:	Continue to evaluate system capacity and impacts of I/I using recommended tools from the Capacity Assessment and Assurance (CAAP) Program Framework Development and Flow Monitoring Program.
Recommendation:	Continue to use the wastewater lift station and force main computer model to assess the need for upgrades to the system based on expected demand for services.
Recommendation:	Continue to televise and smoke test gravity sewers to locate source(s) of I/I. Repair gravity sewers and manholes as required to mitigate I/I and regain sewer and WRF capacity.
Recommendation:	Install odor-control systems at lift stations where hydrogen sulfide concentrations cause odors and deteriorate structures.
Recommendations:	Master Lift Station No. 309 – Bridgewater ▪ Evaluate the significance of the corrosion to wetwell. ▪ Evaluate the significance of concrete wear and cracks around the odor-control unit. ▪ Evaluate alternative drainage options. ▪ Evaluating incorporating dedicated lift station lighting.
Recommendation:	Master Lift Station No. 321 – Angol ▪ Evaluate the significance of the corrosion to wetwell.
Recommendations:	Master Lift Station No. 815 – "Z" ▪ Evaluate the significance of the corrosion near the odor-control system. ▪ Evaluate the significance of cracks on the concrete pad. ▪ Evaluate the need for painting the discharge piping appurtenances. ▪ Evaluate incorporating dedicated lift station lighting.

Recommendations:	Lift Station No. 1 – Community Center
	▪ Evaluate replacement of this station to meet current CCU standards. A replacement lift station should also provide the following to address current deficiencies:
	  ▪ CCU standard lift station design for a new wetwell and new discharge piping and appurtenances.
	  ▪ Electrical controls and panel features to meet CCU standards and electrical codes including an outdoor-rated panel, phase monitors, an SPD, and seal-offs.
	  ▪ SCADA integration.
	  ▪ Permanent security fencing to prevent unwanted access, and dedicated site lighting for accessibility and safety.
	  ▪ Potable water service.
	▪ Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:
	  ▪ Evaluate the significance of the corrosion to wetwell.

Recommendations:	Lift Station No. 2 – Dalton ▪ Evaluate the need for painting the discharge piping appurtenances. ▪ Evaluate the need for barbed wire restoration.
Recommendations:	Lift Station No. 6 – Higgs ▪ Evaluate site lighting for lift station employee serviceability. ▪ Evaluate the need for painting the discharge piping appurtenances. ▪ Evaluate the significance of the cracks in concrete formwork at the top of the wetwell.

Recommendations:	Lift Station No. 7 – Pure Oil
	▪ Evaluate replacement of this station to meet current CCU standards. A replacement lift station should also provide the following to address current deficiencies:
	  ▪ CCU standard lift station design for a new wetwell and new discharge piping and appurtenances.
	  ▪ Electrical controls and panel features to meet CCU standards and electrical codes including an outdoor-rated panel, phase monitors, an SPD, and seal-offs.
	  ▪ SCADA integration.
	  ▪ Permanent security fencing to prevent unwanted access, and dedicated site lighting for accessibility and safety.
	  ▪ Potable water service.
	▪ Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:
	  ▪ Evaluate the possibilities for dedicated access to the station.
	  ▪ Evaluate switching to underground power supply.
	  ▪ Evaluate the significance of the corrosion on the Gorman Rupp pump.

Recommendation:	Lift Station No. 19 – Port Charlotte High School ▪ Evaluate the significance of the corrosion of the piping and fittings within the valve vault.

Recommendations:	Lift Station No. 24 – Charlotte Square ▪ Evaluate the wetwell for potential structural repair and restoration of wetwell lining. ▪ Evaluate the seal of the wetwell and/or raising the wetwell elevation to avoid I/I. ▪ Evaluate constructing a separate, isolated valve vault for operator safety, including a standard dedicated discharge. ▪ Evaluate incorporating dedicated lift station lighting.
Recommendations:	Lift Station No. 25 – Vo-Tech ▪ Evaluate the significance of the wetwell corrosion. ▪ Evaluate potential solutions to grade settlement to re-establish grade near the generator and between the discharge piping and generator to original condition. ▪ Evaluate invert to the east.
Recommendations:	Lift Station No. 44 – Liberty Elementary ▪ Evaluate and perform full replacement of the wetwell, valve vault, and associated appurtenances to meet CCU standards. ▪ Evaluate the significance of the corrosion on the fittings within the valve vault. ▪ Evaluate the addition of an odor-control system. ▪ Evaluate incorporating dedicated access for Operations staff. ▪ Evaluate incorporating dedicated lift station lighting.
Recommendations:	Lift Station No. 45 – Woodbury ▪ Evaluate and complete rehabilitation of the invert and/or manhole to immediate east to restore normal operating conditions. ▪ Evaluate the addition of an odor-control system. ▪ Evaluate the significance of the wetwell corrosion. ▪ Evaluate incorporating dedicated lift station lighting. ▪ Evaluate the damaged electrical support for repair or replacement.
Recommendations:	Lift Station No. 809 – Placida Harbour ▪ Evaluate incorporating a dedicated access for Operations staff, including access for pump trucks. ▪ Evaluate incorporating a water service connection near the station. ▪ Evaluate incorporating dedicated lift station lighting.
Recommendations:	▪ Lift Station No. 812 – Annapolis ▪ Evaluate incorporating a dedicated access for Operations staff. ▪ Evaluate incorporating a water service connection near the station. ▪ Evaluate the addition of a SCADA system. ▪ Evaluate the significance of the wetwell corrosion. ▪ Evaluate incorporating dedicated lift station lighting.

Recommendations:	Lift Station No. 813 – Marina
	▪ The County is performing a rehabilitation project that includes installing a permanent on-site generator. The rehabilitation should provide the following, in general, to address the identified deficiencies:
	  ▪ Dedicated lighting.
	  ▪ Permanent security fencing to prevent unwanted access.
	  ▪ Electrical controls to meet CCU standards and electrical codes including outdoor-rated panel, phase monitors, SPD, and seal-offs.
	  ▪ SCADA integration.
	  ▪ Potable water service.

Recommendation:	Lift Station No. 818 – Harbor West ▪ Evaluate need for painting discharge piping appurtenances.

Recommendations:	Lift Station No. 819 – Rotonda Circle #1
	▪ Evaluate the replacement of this station to meet CCU standards and to relocate away from the waterway. The County owns a nearby empty lot at 261 Bunker Road that should be evaluated. A replacement lift station should provide the following to address the current deficiencies:
	  ▪ CCU standard lift station design for a new wetwell and new discharge piping and appurtenances.
	  ▪ Electrical controls and panel features to meet CCU standards and electrical codes including an outdoor-rated panel, phase monitors, an SPD, and seal-offs.
	  ▪ SCADA integration.
	  ▪ Permanent security fencing to prevent unwanted access, and dedicated site lighting for accessibility and safety.
	  ▪ Potable water service.
	▪ Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing LS in the interim:
	  ▪ Evaluate the significance of corrosion to the discharge valves.

Recommendations:	Lift Station No. 821 – Rebel Court ▪ Evaluate the significance of the degradation of the wetwell and relining of the wetwell. ▪ Evaluate the significance of the corrosion on the valves in the valve vault. ▪ Evaluate the integrity of the wetwell hatch. ▪ Evaluate incorporating dedicated lift station lighting.

Recommendations:	Vacuum Station No. 1 – Skylark ▪ Evaluate modifying the overhead crane for lateral movement. ▪ Evaluate adding a catwalk for accessing the top of the tank. ▪ Evaluate replacing the check valve with a CCU standard check valve. ▪ Evaluate full rehabilitation of the mulch bed odor-control to mitigate deficiencies. ▪ Evaluate lighting improvements for operators like Ackerman, VS 4. ▪ Evaluate trench drainage implementation like Harbor VS 2. ▪ Evaluate and install discharge a flow meter.
Recommendations:	Vacuum Station No. 2 – Harbor ▪ Evaluate modifying the overhead crane for lateral movement. ▪ Evaluate adding a catwalk for accessing the top of the tank for maintenance. ▪ Evaluate long-term solutions to the pump skid rusting. ▪ Evaluate replacing corroded seals on the moisture separators. ▪ Evaluate lighting improvements like those at Ackerman, VS 4. ▪ Evaluate security improvements for better monitoring (i.e., cameras, etc.).
Recommendation:	Vacuum Station No. 4 – Ackerman ▪ Evaluate trench drainage implementation like Harbor, VS-2.

10.1.5 Wastewater Treatment Facilities

Table 10-5 WRF Planning Recommendations

Recommendation:	Evaluate the need for technical support from the software company or from the County's IT group with hours set aside to work exclusively on data transfer and report set-up and implementation to expand and optimize the LIMS capabilities.
Recommendation:	Evaluate cost-effective disposal alternatives for dewatered biosolids other than transporting to Synagro and the landfill as part of the plant upgrade.
Recommendation:	Replace septage receiving pre-treatment units when repair is no longer cost effective and modify to allow septage treatment in aerated sludge-holding tank and/or pump to the headworks.
Recommendation:	Complete financing and project preparations for bidding and construction of the East Port WRF expansion project.
Recommendation:	Complete financing and project preparations for bidding and construction of the Burnt Store WRF expansion project.
Recommendation:	Prepare an MIT plan for IW-1 at the East Port WRF for approval by FDEP. The next MIT should be completed and submitted to FDEP prior to September 4, 2024.
Recommendation:	Complete evaluation for expansion of West Port WRF and determining future use of Rotonda WRF, based on future flows. See previous Annual Reports for CIP recommendations related to West Port WRF.
Recommendation:	Evaluate different aeration systems for the reclaimed water storage pond at the Rotonda WRF.

Recommendation:	Evaluate additional denitrification capacity for Rotonda WRF as part of the plant expansion.
Recommendation:	Evaluate adding another EQ tank to respond to additional surges at Rotonda WRF as part of the plant expansion.
Recommendation:	Evaluate additional reclaimed water storage at the Rotonda WRF.
Recommendation:	Create O&M Manuals for each plant based on EPA criteria.
Recommendation:	Evaluate the existing Burnt Store WRF generator performance to determine limitations that may occur prior to construction of plant expansion, which will include a new generator.

10.1.6 Reclaimed Water Distribution System

Table 10-6 Reclaimed Water System Planning Recommendations

Recommendation:	Maintain updated hydraulic models for the MRS and Burnt Store system to predict the impact of future demand on the reclaimed water transmission systems.
Recommendation:	Develop and complete a community survey to better determine potential reclaimed water customers. Results of the study can be used to determine economic feasibility of water delivery.
Recommendation:	Evaluate adding piping connections (including controls, pumps, valves, meters, etc.) to increase the number of small users in Mid County.
Recommendation:	Seek ways to increase the use of reclaimed water currently produced by CCU WRFs including improving reliability and access for customers.
Recommendation:	Create a reclaimed water system O&M Manual and operating protocols.
Recommendation:	Continue to develop and host public education events to educate the community on the benefits water of reclaimed water.

10.1.7 Utility Support Services

Table 10-7 Utility Support Services – Planning Recommendations

Recommendation:	Evaluate staffing, sample courier service, testing procedures, and equipment as it relates to future monitoring requirements. AWT expansions of East Port WRF and Burnt Store WRF will require additional testing; also, as of March 2023, the frequency of analysis for BOD, TSS, total nitrogen, and total phosphorus at East Port WRF increased from 5 days per week to 7 days per week.
Recommendation:	Develop Change Management/Version Control Standards.[1]
Recommendation:	Develop Contingency and Disaster Recovery Plan.[1]
Recommendation:	Develop Transition Plan for Lift Station Sites.[1]
Recommendation:	Hire New I&C Staff.[1]
Recommendation:	Use Cityworks implementation to develop Utility AMP to track water, wastewater, and reclaimed distribution systems and facilities.
Recommendation:	Continue to convert as-builts and incorporate complete projects into the existing GIS system. When possible, require contractors to provide as-built shapefiles as part of major construction project close-out.
Recommendation:	Fully complete transition to VT Scada at applicable facilities.[1]

[1] Recommendations from SCADA Master Plan (McKim & Creed, March 2020).

10.2 CAPITAL IMPROVEMENTS

Table 10-8 through Table 10-21 summarize the CIPs that were identified and recommended during the FY 2023 condition assessments. Capital improvement recommendations refer to items that are expected to exceed $100,000 to accomplish. The recommendations have been compiled from each chapter and are summarized for each CCU Workgroup.

10.2.1 ADMINISTRATIVE BUILDINGS

Table 10-8 East Port Environmental Campus – CIP Recommendations

Recommendation:	Continue to evaluate rehabilitation of the Administration Building and other local facilities damaged by Hurricane Ian.

10.2.2 WATER TREATMENT PLANTS

Table 10-9 Burnt Store RO WTP – CIP Recommendations

Recommendation:	Install additional permitted groundwater wells as needed to meet future demands.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.

10.2.3 WATER DISTRIBUTION SYSTEM

Table 10-10 Port Charlotte PWS – CIP Recommendations

Recommendations:	WBS General ▪ Complete load studies and arc-flash labeling for electrical equipment in order to meet compliance with NFPA 70E. ▪ Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds. ▪ Complete construction of the new O'Hara WBS and place the new WBS into service. This improvement was identified in the Water Master Plan as a water quality improvement which would significantly reduce flushing. ▪ Begin design of the new Robin WBS and place the new WBS into service. This improvement was identified in the Water Master Plan as a water quality improvement which would significantly reduce flushing. ▪ Design and construct a new 24-to-30 inch diameter water main from Gulf Cove WBS to Rotonda WBS as an extension from the Authority's Phase 2B 42-inch transmission main as a dedicated feed line for Rotonda's 5-MGD GST. ▪ Design and construct 1,100ft of 16-inch water transmission main along SR-776 that feeds the 24-inch dedicated transmission line to Rotonda GST (between Gillot Road & Conway Road). ▪ Evaluate replacement of analog pressure gauges with pressure transducers integrated into SCADA.

	Walenda WBS
Recommendations:	▪ Complete the generator replacement project at the WBS, including a new generator and fuel tank designed above the flood plain. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
	Gulf Cove WBS
Recommendations:	▪ Complete design and construction of new GST(s) and demolition of the existing 2-MG GST that has reached end of serviceable life. Synchronize construction timing and hydraulic conditions with the Authority RTS 42-inch Phase 2B pipeline to Gulf Cove WBS. ▪ Complete the generator replacement project at the WBS, which includes a new generator and fuel tank designed above the flood plain. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
	Rotonda WBS
Recommendations:	▪ Replace approximately 1,100 feet of 12-inch piping that restricts flow/capacity of the 24-inch line (from Gillot Road to just north of Conway Road) feeding the Rotonda water booster tank. ▪ Continue to monitor electrical systems performance to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.

[1] Recommendation from RRA Report (March 2020).

Table 10-11 Burnt Store PWS – CIP Recommendations

Recommendation:	Continue replacing old "class" PVC pipe in the distribution system with new C-900 PVC pipe.
Recommendation:	Continue developing a computerized hydraulic model for the Burnt Store PWS.
Recommendation:	Investigate the feasibility of installing interconnects with neighboring utilities.[1]
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.

[1] Recommendation from RRA Report (March 2020).

10.2.4 Wastewater Collection Systems

Table 10-12 Sewer and Lift Station Systems – CIP Recommendations

Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.

Table 10-13 Vacuum System – CIP Recommendations

Recommendation:	Evaluate staffing requirements and ability to provide additional sampling support to Operations staff.
Recommendation:	Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Recommendation:	Evaluate hiring IT support that can work exclusively on the set-up and implementation of the LIMS or purchase a service package from the vendor to do the set-up of laboratory-specific forms and reports with remote installation.

10.2.5 Wastewater Treatment Facilities

Table 10-14 East Port WRF – CIP Recommendations

Recommendation:	The previous CIP recommendations have been consolidated and incorporated into the East Port WRF 9.0-MGD or 12.0-MGD expansion project.
Recommendation:	Evaluate the replacement of the older 1,250-kW emergency generator.

Table 10-15 West Port WRF – CIP Recommendations

Recommendation:	Take Aeration Basin No. 4 offline and drain for maintenance and cleaning as planned in FY 2024.

Table 10-16 Rotonda WRF – CIP Recommendations

Recommendation:	Add secondary containment on the piping of the sodium hypochlorite storage.
Recommendation:	Add the Rotonda WRF as a reclaimed water user, and add an irrigation system to help maintain grass.

Table 10-17 Burnt Store WRF – CIP Recommendations

Recommendation:	The previous CIP recommendations have been consolidated and incorporated into the Burnt Store WRF expansion project.

Table 10-18 Leachate Treatment Facility – CIP Recommendations

Recommendation:	Complete rehabilitation of LS No. 3.

10.2.6 Reclaimed Water Distribution System

Table 10-19 Reclaimed Water Distribution System – CIP Recommendations

Recommendation:	CIP recommendations to improve capacities of treatment, storage, and pumping in the MRS and Burnt Store systems are included in the Reclaimed Water Master Plan.

10.2.7 Utility Support Services

Table 10-20 EPLAB – CIP Recommendations

Recommendation:	Open a new position and hire an additional Laboratory Technician in FY 2024 to increase their reliability and capabilities for the upcoming added testing and permit reporting that will be required as the County's WRFs are upgraded to AWT facilities. The position will need to be added and filled in FY 2024 or FY 2025 due to the required duration of the training in the laboratory.

Table 10-21 Operation and Information Technology – CIP Recommendations

Recommendation:	Add the Headworks PLC at Rotonda WRF to SCADA.
Recommendation:	Add the PLCs at East Port WRF to SCADA.
Recommendation:	Build the Central Control Center at East Port WRF.
Recommendation:	Complete the Cybersecurity Audit.
Recommendation:	Fully transition to VTScada software at all plant facilities.
Recommendation:	Convert to VTScada software (remote sites).
Recommendation:	Develop Lift Station/Reclaimed Water Booster Station Design Standards.
Recommendation:	Develop SCADA Specifications and Standards.
Recommendation:	Improve the septage billing at East Port WRF.
Recommendation:	Replace the PLCs at Gulf Cove WBS, Walenda WBS, Englewood WBS, Golf Course WBS, Myakka WBS, Ingraham Disinfection Station, & Rotonda WRF.
Recommendation:	Install fiber at Gulf Cove WBS, Walenda WBS, Englewood WBS, Golf Course WBS, Ingraham Disinfection Station, El Jobean Vacuum Station, Harbor Vacuum Station, Skylark Vacuum Station, Rotonda RWBS, West Port RWBS, Walenda RWBS, Eagle Street RWBS, Rotonda WRF.
Recommendation:	Replace the DH+ Network at West Port WRF.
Recommendation:	Replace the reclaimed water delivery site control panels.
Recommendation:	Replace the switchgear at East Port WRF as part of the plant expansion.

Note: All recommendations from SCADA Master Plan (McKim & Creed, March 2020).

10.3 Operation and Maintenance

Table 10-22 through Table 10-32 summarize the O&M items that were identified and recommended during the FY 2023 condition assessments. O&M recommendations refer to items that can be completed by CCU staff or within the Operations budgets (i.e., tasks that are expected to be less than $100,000). The recommendations have been compiled from each chapter and summarized for each CCU Workgroup.

10.3.1 Water Treatment Plants

Table 10-22 Burnt Store RO WTP – O&M Recommendations

Recommendation:	Continue to perform yard maintenance around the perimeter fencing.[1]
Recommendation:	Repair the security gate mechanism so that it can be opened and closed remotely.
Recommendation:	Continue to inspect and tighten the connections for the scale inhibitor, sodium hydroxide, sodium hypochlorite, and sulfuric acid pipes daily to prevent leakage.
Recommendation:	Continue to maintain and repair the membranes to extend life to the extent feasible (also replace end caps and leaks).
Recommendation:	Install a cover over the transfer pumps and piping near the degasifier towers to prevent sun damage and prolong equipment life.
Recommendation:	Continue to spray wash the concentrate disposal wetwell as needed.
Recommendation:	Continue maintenance of controlled burns on the property to maintain shrub growth and fire buffer around wells.[1]
Recommendation:	Install bollards around the influent transformer box.[1]
Recommendation:	Install fire hose connections on the well piping.[1]
Recommendation:	Due to difficulty pumping against high head, evaluate replacement of transfer pumps near the degasifier system.
Recommendation:	Replace the chemical feed pumps, as they are nearing the end of their service life.
Recommendation:	Develop an ERP for valve failure in the clearwell and begin exercising the valve.[1]

[1] Recommendation from RRA Report (March 2020).

10.3.2 Water Distribution System

Table 10-23 Port Charlotte PWS – O&M Recommendations

Recommendation:	General ▪ Complete repair and rehabilitation of assets damaged by Hurricane Ian, maximizing use of available FEMA funds.
Recommendations:	Interconnects ▪ Lower the lighting fixtures under the canopy to illuminate the pumps and equipment at the EWD interconnect. ▪ Add an intrusion alarm to the CCU RTU panels.[1] ▪ Install bollards around the equipment.[1]
Recommendations:	Port Charlotte Golf Course WBS ▪ Continue to perform yard maintenance around the perimeter fencing.[1] ▪ Label the switchgear to identify parts and components that could be energized. ▪ Replace the cage around the GST ladder to comply with OSHA requirements. ▪ Replace the torn hazard warning label on the diesel fuel tank. ▪ Replace the screens on the flow meters and install UV protection.

	Walenda WBS
Recommendations:	▪ Continue to perform yard maintenance around the perimeter fencing.[1] ▪ Trim tree limbs on the northwest corner of the pump room.[1] ▪ Install bollards around the WBS effluent pipe.[1] ▪ Clearly label chemical storage tanks and fill valves.[1] ▪ Resurface and recoat the exterior of the GST. ▪ Add additional signage indicating "No Trespassing, Violators will be Prosecuted" along fencing.[1] ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
	Gulf Cove WBS
Recommendations:	▪ Pump out the water in the vault containing the HSP feed piping. ▪ Secure the electrical conduit for the newly installed cameras. ▪ Place HSP No. 1 back into service. ▪ Add secondary containment to the chemical feed room. ▪ Replace the exhaust fan in the ammonia chemical feed room. ▪ Continue to monitor water quality entering the Gulf Cove WBS.[1] ▪ Properly secure the pressure transducer at the back of the GST. ▪ Replace the corroded copper sodium hypochlorite chemical injection quill with a Schedule 80 material. ▪ Repaint the Pump Building. ▪ Continue to monitor performance of the electrical systems to ensure proper functionality and replace insufficient components as needed. Electrical equipment is being evaluated as part of the WBS Upgrades project.
	Rotonda WBS
Recommendations:	▪ Continue to monitor performance of the electrical systems to for proper functionality and replace components as needed. Electrical equipment is being evaluated in the WBS Upgrades. ▪ Paint the wall that contains the HMI in the pump room. ▪ Replace damaged pressure gauges. ▪ Relocate the ATS indoors. ▪ Repair the roof and awnings on the pump building. ▪ Replace the incoming breaker as soon as possible. The failure of this specific device may render the station out of service for an extended period. ▪ Further recommend that the gaps surrounding the VFDs be mitigated to prevent potential contact with live parts. ▪ Install bollards around the monitoring equipment.[1] ▪ Clearly label chemical storage tanks and fill valves.[1] ▪ Develop an ERP for WBS bypass and operations without laboratory and control room.[1] ▪ Develop a standard schedule for tank filling operations.

Recommendations:	Ingraham Disinfection Station ▪ Clearly label chemical storage tanks. ▪ Fix the level indicators for the sodium hypochlorite storage tanks.

[1] Recommendation from RRA Report (March 2020).

10.3.3 Wastewater Collection Systems

Table 10-24 Wastewater Collection System – O&M Recommendations

Recommendation:	Master Lift Station No. 65 – South Port (Electrical Only) ▪ Remove the abandoned pressure switches. ▪ Make provisions to lower generator controls height. ▪ Restore cover to original condition.
Recommendation:	Master Lift Station No. 309 – Bridgewater ▪ Re-establish grade at the fence line. ▪ Repair or replace piping and valves in the underground valve vault. ▪ Configure SCADA control points for generator operation. ▪ Restore barbed wire to original condition.
Recommendations:	Master Lift Station No. 321 – Angol ▪ Rehabilitate or replace the wetwell vent and dedicated suction. ▪ Restore the flow meter to good operating condition. ▪ Restore barbed wire to original condition.

Recommendations:	Lift Station No. 1 – Community Center
	▪ Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing lift station in the interim:
	  ▪ Anchor the access hatch hinge back to the wall.
	  ▪ Paint the above ground pump and discharge piping.
	  ▪ Seal cracks in building and gaps in pipe penetrations.
	  ▪ Restore and seal the conduit connection to the electric meter.

Recommendations:	Lift Station No. 6 – Higgs ▪ Re-establish level grade along southwest fence line and along the perimeter fence line. ▪ Replace the check valve seals during next check valve maintenance.
Recommendations:	Lift Station No. 7 – Pure Oil ▪ Install new and/or up to date SPDs to protect the pumps and SCADA system. ▪ Install proper indoor lighting. ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with codes. ▪ Rehabilitate the float terminal blocks to meet NEC code.

Recommendations:	Lift Station No. 19 – Port Charlotte High School ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with codes. ▪ Install new and/or up-to-date SPDs to protect the pumps and SCADA system. ▪ Repair or replace the vent piping.
Recommendation:	Lift Station No. 24 – Charlotte Square ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes.
Recommendations:	Lift Station No. 25 – Vo-Tech ▪ Remove the conduit and rebar protruding through grade. ▪ Replace the removed ARVs on the discharge piping. ▪ Replace the check valves with those specified in CCU standards. ▪ Install new and/or up-to-date SPDs to protect the pumps and SCADA system
Recommendations:	Lift Station No. 44 – Liberty Elementary ▪ Restore corroded fence materials and repair fence damage. Re-establish the grade between the fence and gravel. ▪ Re-establish the pump to its original seating to prevent blowback. ▪ Replace seal offs to the control panel due to heavy corrosion and immense sulfide odor.
Recommendations:	Lift Station No. 45 – Woodbury ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with codes. ▪ Replace corroded fence materials. ▪ Repair fence and barbed wire damage. ▪ Rehabilitate or replace check valve. ▪ Install new and/or up to date SPDs to protect the pumps and SCADA system.
Recommendations:	Lift Station No. 809 – Placida Harbour ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with codes. ▪ Install battery backups to provide redundancy for signaling to Operations staff.
Recommendations:	Lift Station No. 812 – Annapolis ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with codes. ▪ Seal the cracks and leaks in wetwell.

Recommendations:	Lift Station No. 813 – Marina ▪ Secure the mechanical interlock behind the dead front between the generator and the main breaker. ▪ Complete surface preparation to remove rust and excess paint, and apply standard green paint to discharge piping and plug valve to represent sewer utility. ▪ Repair wetwell gaps to eliminate access gaps and excess I/I to the lift station. Incorporate drainage provisions as necessary to appropriately capture and divert surface water runoff to avoid and prevent flooding.
Recommendations:	Lift Station No. 819 – Rotonda Circle #1 ▪ Assuming the station will be completely replaced in the near future, the following improvements are recommended to the existing lift station in the interim: ▪ Seal and re-line the wetwell to reduce excess I/I and prevent degradation of the wetwell interior. ▪ Install an on-site communications system and integrate the existing lift station to SCADA.
Recommendations:	Lift Station No. 821 – Rebel Court ▪ Install seal-offs on any electrical equipment within 10 feet of the wetwell to conform with current codes. ▪ Rehabilitate or replace the camlock connection. ▪ Re-establish the grade around the wetwell lid. ▪ Install new and/or up-to-date SPDs to protect the pumps and SCADA system.
Recommendation:	Vacuum Station No. 1 – Skylark ▪ Replace the plastic covers for the pump motor components.

10.3.4 WASTEWATER TREATMENT FACILITIES

Table 10-25 East Port WRF – O&M Recommendations

Recommendation:	Convey Digester Decant, In-Plant Pump Station No. 1, and No. 2 Plant Recycle flows into the EQ Tank once expansion is complete.
Recommendation:	Repaint all faded or chipped paint on aboveground piping and pumps throughout the plant within the next 2 to 3 years.
Recommendation:	Repair damaged conduits, connectors, and conduit supports throughout plant, as identified in Section 6.2.
Recommendation:	Repair hurricane-related damage identified in Section 6.2.
Recommendation:	Replace hose bibbs connections at the headworks.
Recommendation:	Replace insultation for Probe SC100 piping on Oxidation Ditch No. 2.
Recommendation:	Include more bird deterrents near the clarifiers.
Recommendation:	Rails for backwash mechanism at the filters are in fair condition but wall support is beginning to rust. The wall support should be painted.
Recommendation:	Repair the failed gearbox at Filter No. 1.
Recommendation:	Replace the gate at the clearwell.

Recommendation:	Clean out diffusers as they become clogged.
Recommendation:	Replace base of pump heads at the HSPS No. 1 and Pond Transfer Pumps.
Recommendation:	Replace the irrigation pumping station electrical switchgear.

Table 10-26 West Port WRF – O&M Recommendations

Recommendation:	Inspect the reclaimed water HSP pumps to evaluate condition of shafts and other components.
Recommendation:	Secure all electrical switchgear to prevent unauthorized access or inadvertent exposure to live parts.

Table 10-27 Rotonda WRF – O&M Recommendations

Recommendation:	Add UV protection to the CCCs.
Recommendation:	Add UV protection to the sides of the chlorine storage tanks to protect from direct sun light.
Recommendation:	Continue to paint tanks, buildings, and pipes in the next 2 years.
Recommendation:	Adjust the membrane slack as needed. These membranes are at the end of their life cycle and this maintenance is critical for their longevity.
Recommendation:	Continue monitoring and trending membrane permeability data and add temperature to the data collected weekly so permeability can be corrected with temperature to account for seasonal changes in water viscosity.
Recommendation:	Constantly monitor membrane permeability trend, especially for Train Nos. 3 and 4, for which end of life is estimated to be 2024 and 2026, respectively, since this trend can either accelerate or decelerate.
Recommendation:	Complete electrical load study and arc-flash labeling.
Recommendation:	Purchase a few module blanks for top and bottom headers and wait to observe membrane effluent turbidity spikes, which would indicate that one of the cracked potting headers has breached the membrane integrity. Remove the compromised membrane module and install module blanks in its place until new purchased membrane module is received. Once the new membrane module is received, install the new membrane in the middle of the cassette and move an existing module where the compromised module was. This could prolong the new membrane module potting header life.
Recommendation:	A year before scheduled replacement, order membrane modules. Install new membrane modules in Train No. 1. Do not install new membrane modules with existing membrane modules in the same train. Move the existing membrane modules from Train No. 1 to Train No. 4. Train No. 4 will then have six membrane cassettes, which will extend the life of the membranes.

Table 10-28 Burnt Store WRF – O&M Recommendations

Recommendation:	Perform maintenance and equipment replacement as necessary until the WRF expansion can be completed.
Recommendation:	Investigate high frequency of replacement of chemical feed pumps. Consider replacement using different manufacturer and/or equipment model.
Recommendation:	Complete motor repairs for Blower No. 1 and place back in service.
Recommendation:	Repair front access gate from hurricane-related damage and fully establish security.
Recommendation:	Continue to evaluate and repair composite sampling units as necessary.
Recommendation:	Evaluate replacement of EQ tank Pump No. 2 due to fused volute and lack of maintenance access.
Recommendation:	Evaluate cause of VFD issues for EQ tank Pump No. 2.

Table 10-29 Leachate Treatment Facility – O&M Recommendations

Recommendation:	Add a generator to the treatment facility to keep the plant operational during power outages.
Recommendation:	Evaluate ways to address the effluent tank transfer pumps having high heat output and being open to exposure, prioritizing safety. Potential solutions include installation of safety features, installation of cooling jackets, or replacement of pumps with non-submersible type pumps.

10.3.5 Reclaimed Water Distribution System

Table 10-30 Reclaimed Water Distribution System –O&M Recommendations

Recommendation:	RWBS General Develop an operational protocol for the MRS. CCU staff to operate the reclaimed water system under a select number of operational configurations and determine their preferred method for meeting their reclaimed water demands using the hydraulic model.
Recommendation:	Install throttling control valves at all current and future major reclaimed water users with pond discharges.
Recommendation:	Complete repairs for facilities and assets that experienced hurricane-related damage.
Recommendation:	Replace all UV-impacted transducer screens and install proper UV protection.
Recommendation:	Properly recoat and repaint all above-ground piping.
Recommendations:	Eagle Street RWBS ▪ Replace the anchor system for the chlorine storage tank. ▪ Replace damaged pressure gauges.
Recommendations:	Walenda RWBS ▪ Properly secure the bypass actuator. ▪ Replace or fix the GST level gauge.

	Rotonda Blvd. RWBS
Recommendations:	▪ Replace flexible conduits as needed. ▪ Recalibrate equipment. ▪ Replace damaged pressure gauges and install UV protection.

10.3.6 Utility Support Services

Table 10-31 EPLAB – O&M Recommendations

Recommendation:	Continue implementation of LIMS.
Recommendation:	Continue working with sampling personnel on sampling protocols; in particular, sample labeling in the field, correct completion of chain-of-custody information, and sample submittal.

Table 10-32 Operation and Information Technology – O&M Recommendations

Recommendation:	Revise Fiber Optic Network for Physical Redundancy at East Port WRF.
Recommendation:	Integrate SCADA into LIMS.

Note: All recommendations from SCADA Master Plan (McKim & Creed, March 2020).