

**Mayor**

Joe Coviello

**Council Members**

District 1: John Gunter

District 2: John M. Carioscia Sr.

District 3: Marilyn Stout

District 4: Jennifer I. Nelson

District 5: Dave Stokes

District 6: Richard Williams

District 7: Jessica Cosden



1015 Cultural Park Blvd.  
Cape Coral, FL

**City Manager**

John Szerlag

**City Attorney**

Dolores Menendez

**City Auditor**

Andrea R. Butola

**Interim City Clerk**

Kimberly Bruns

**AGENDA  
COMMITTEE OF THE WHOLE**

January 28, 2019

4:30 PM

Council Chambers

**PLEDGE OF CIVILITY**

We will be respectful of each other even when we disagree.  
We will direct all comments to the issues. We will avoid personal attacks.

**1. MEETING CALLED TO ORDER**

A. MAYOR COVIELLO

**2. PLEDGE OF ALLEGIANCE****3. ROLL CALL**

A. MAYOR COVIELLO, COUNCIL MEMBERS CARIOSCIA, COSDEN, GUNTER, NELSON, STOKES, STOUT, WILLIAMS

**4. BUSINESS:**

A. CITIZENS INPUT TIME

A maximum of 60 minutes is set for input of citizens on matters concerning the City Government; 3 minutes per individual.

B. DISCUSSION

- (1) Beer and Wine Sales at Sun Splash Waterpark - Kerry Runyon, Parks and Recreation and John Szerlag, City Manager
- (2) Parks and Recreation Master Plan for Citywide GO Bond Park Improvements - City Manager Szerlag and Staff
- (3) 2017 Utilities Annual Report - Jeff Pearson, Utilities Director and Ron Cavalieri, P.E. with AECOM

**5. ROUND TABLE DISCUSSION**

## **6. TIME AND PLACE OF FUTURE MEETINGS**

- A. A Regular Meeting of the Cape Coral City Council is Scheduled for Monday, February 4, 2019 at 4:30 p.m. in Council Chambers

## **7. MOTION TO ADJOURN**

### **GENERAL RULES AND PROCEDURES REGARDING THE CAPE CORAL CITY COUNCIL AGENDA**

In accordance with the Americans with Disabilities Act and Section of 286.26, Florida Statutes, persons with disabilities needing special accommodation to participate in this meeting should contact the Office of the City Clerk at least forty-eight (48) hours prior to the meeting. If hearing impaired, telephone the Florida Relay Service Numbers, 1-800-955-8771 (TDD) or 1-800-955-8770 (v) for assistance.

Persons wishing to address Council under Citizens Input or the Consent Agenda may do so during the designated times at each meeting. No prior scheduling is necessary. All speakers must have their presentations approved by the City Clerk's office no later than 3:00 PM the day of the meeting.

Any citizen may appear before the City Council at the scheduled PUBLIC HEARING/INPUT to comment on the specific agenda item being considered. No prior scheduling is necessary.

When recognized by the presiding officer, a speaker shall address the City Council from the designated speaker's lectern, and shall state his or her name and whom, if anyone, he or she represents. An address shall only be required if necessary to comply with a federal, state or local law.

Copies of the agenda are available in the main lobby of Cape Coral City Hall and in the City Council Office, 1015 Cultural Park Boulevard. Copies of all back-up documentation are also available for review in the lobby of Council Chambers. You are asked to refrain from removing any documentation. If you desire copies, please request they be made for you. Copies are 15 cents per page. Agendas and back-up documentation are also available on-line on the City website ([capecoral.net](http://capecoral.net)) after 4:00 PM on the Thursday prior to the Council Meeting.

### **\*PUBLIC HEARINGS DEPARTMENT OF COMMUNITY DEVELOPMENT CASES**

In all public hearings for which an applicant or applicants exist and which would affect a relatively limited land area, including but not limited to PDPs, appeals concerning variances or special exceptions, and small-scale rezonings, the following procedures shall be utilized in order to afford all parties or their representatives a full opportunity to be heard on matters relevant to the application:

1. The applicant, as well as witnesses offering testimony or presenting evidence, will be required to swear or affirm that the testimony they provide is the truth.
2. The order of presentation will begin with the City staff report, the

presentation by the applicant and/or the applicant's representative; witnesses called by the applicant, and then members of the public.

3. Members of the City Council may question any witness on relevant issues, by the applicant and/or the applicant's representative, City staff, or by any member of the public.
4. The Mayor may impose reasonable limitations on the offer of testimony or evidence and refuse to hear testimony or evidence that is not relevant to the issue being heard. The Mayor may also impose reasonable limitations on the number of witnesses heard when such witnesses become repetitive or are introducing duplicate testimony or evidence. The Mayor may also call witnesses and introduce evidence on behalf of the City Council if it is felt that such witnesses and/or evidence are necessary for a thorough consideration of the subject.
5. After the introduction of all-relevant testimony and evidence, the applicant shall have the opportunity to present a closing statement.
6. If a person decides to appeal any decision made by the City Council with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that, for such purpose, he or she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based.

**Item Number:** B.(1)  
**Meeting Date:** 1/28/2019  
**Item Type:** DISCUSSION

**AGENDA REQUEST FORM**  
CITY OF CAPE CORAL



**TITLE:**

Beer and Wine Sales at Sun Splash Waterpark - Kerry Runyon, Parks and Recreation and John Szerlag, City Manager

**REQUESTED ACTION:**

**STRATEGIC PLAN INFO:**

1. Will this action result in a Budget Amendment?
2. Is this a Strategic Decision?
  - If Yes, Priority Goals Supported are listed below.
  - If No, will it harm the intent or success of the Strategic Plan?

**Planning & Zoning/Staff Recommendations:**

**SUMMARY EXPLANATION AND BACKGROUND:**

**LEGAL REVIEW:**

**EXHIBITS:**

Staff Presentation

**PREPARED BY:**

Division- Department-

**SOURCE OF ADDITIONAL INFORMATION:**

Kerry Runyon  
Parks And Recreation Director  
1-239-573-3110

**ATTACHMENTS:**

Description	Type
<input type="checkbox"/> Staff Presentation	Backup Material



## **Beer and Wine Proposal**

January 2019

# Why we want to sell wine, beer, and wine smoothies:

Sun Splash Waterpark offers a combination of pools, slides, and water features that provide a wide variety of water related recreation.

Revenue from alcohol sales would address the following needs:

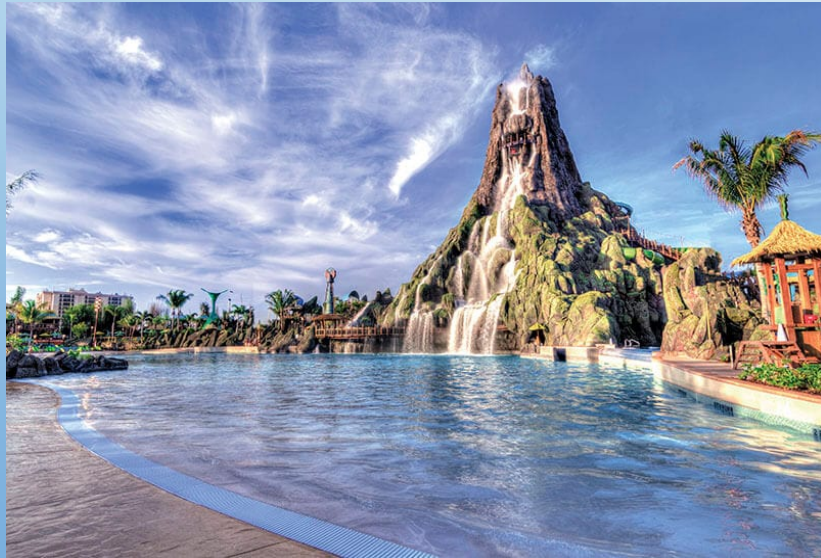
- Age related park maintenance
- Allow for new amenities at the park
- Open the doors for corporate events
- Reduce dependency on the General Fund



# ALL THE **COOL PARKS** ARE DOING IT!

## VOLCANO BAY

ORLANDO, FL



## ADVENTURE ISLAND

TAMPA, FL



## WATER WORLD

HYLAND HILLS PARK AND RECREATION  
DISTRICT

DENVER, CO



# AND THE **MUNICIPAL PARKS** ARE DOING IT TOO!

## BUCCANEER BAY

WEEKI WACHEE SPRINGS STATE PARK

WEEKI WACHEE, FL



## CASTAWAY COVE

CITY OF WICHITA FALLS

WICHITA FALLS, TX



## MAGIC WATERS

ROCKFORD PARK DISTRICT

ROCKFORD, IL (BEGINNING 2019)



In order to better serve our guests and to generate revenue for the park, we respectfully request Council consider allowing Sun Splash Waterpark to serve beer, wine, and wine smoothies at the Tiki Hut located in the middle of the waterpark with a 2-drink maximum drink per person. This presentation will cover general information as well as topics including: staff training, serving management/control, potential revenue, start-up and anticipated annual expense, and how that revenue will benefit the City of Cape Coral.

# PARK ATTENDANCE

2018	96,220	Issues with Pirate's Cove (Tot Spot) and re-building
2017	87,969	No building and Hurricane Irma
2016	87,375	No Tot Spot and fire
2015	<u>114,348</u>	Regular season
	385,912	$385,912 / 4 = 96,478$ If use the last 4 years attendance
		$271,564 / 3 = 90,521$ If use the last 3 years attendance



## Average 120 days and 91,000 annual visitors for calculation purposes.

Industry professionals from waterpark conferences have reported an approximate 10% increase in park attendance once they added alcohol to their offerings. Our calculations will be based upon the past three years attendance with no increase in attendance; thus, we believe our calculations to be conservative.

Revenue generated would immediately be utilized for Pirate's Cove repairs and inspection required maintenance items.

Attendance - to show basic methodology calculations  
Staff is being extremely conservative in projections

## Number of potential drinks based on attendance: 91,000 guests, 120 operating days.

Daily Patrons	Adult-Child Ratio	# of Adults	1 Drink	2 Drinks
758	2A - 2C	380	190	380
758	1A - 2C	253	253	506

Consider having a drink while at dinner or at the beach. It is common to consume two beverages during two hours. In a 5-7 hour day at Sun Splash, a driver would likely consume 0-1 drinks and the non-driver up to 2-drinks over the course of the day.

We believe the 2A-2C group, with 380 adults, consumption could average four beverages ( $4 \times 380 = 1,520$ ) and the 1A-2C group, with 253 adults, could average 190 beverages.

$1,520 + 190 = 1,710$  beverages  $\times$  \$4 potential profit = \$6,840 daily revenue

# Alcohol Sales Potential General Information

**Based on an average profit of \$4/beverage:**

- Selling 190 adult beverages per day could net approximately \$760 daily. Assuming 120 operating days, the revenue generated is approximately **\$91,200.**
- Selling 250 adult beverages per day could net approximately \$1,000 daily. At 120 operating days, the approximate revenue is **\$120,000.**

Note: Selling 190-250 beverages per day is deemed conservative by industry standards.



# Staff Training

## **All alcohol servers will be T.I.P.S. Certified.**

- T.I.P.S. Training costs \$40/employee.
- At minimum, four contract employees would be T.I.P.S. Certified to cover the 854 seasonal hours plus two full time staff would be trained.
- T.I.P.S. Training (training for intervention procedures) focuses on alcohol serving training to reduce exposure to alcohol violations/liability issues, lower insurance premiums and improve customer service. It gives special priority to *people skills*: recognizing when different types of people may be intoxicated, handling an intoxicated customer, and noticing a fake ID.



# SERVING CONTROL

- Wristbands are obtained by presenting valid identification at guest services where names and dates of birth are logged by date.
- An associate will securely place a two tab (2 drink max) vinyl band on the approved guest's wrist and each time they purchase an alcoholic beverage, a tab would be taken.
- Any disruptive guest will be tracked and not permitted to obtain a wristband for, at minimum, the remainder of the operating season or until staff deems appropriate.
- COST PER WRISTBAND: 13 CENTS

# OPTION 1: WINE



- 6.3 oz plastic cup with lid
- Several flavors (Chardonnay, Merlot, Pinot Grigio White Zinfandel, Moscato)
- Our cost: \$2.09 each
- Sell for \$6
- Wristband cost \$.13
- **Net profit \$3.78**

# OPTION 2: ALUMINUM BOTTLE

Long Neck Bottles or Cans	Type	Average Price/Case	Cost/Serving	Add \$.13 for Wristband	Profit at \$6 Price
1 case (24)	Domestic	\$ 26.00	\$ 1.08	\$ 0.13	\$ 4.79

# OPTION 3: WINE SMOOTHIES

## Strawberry Daiquiri Wine Smoothie

3oz Rhumero	\$	0.75
3oz Strawberry Daiquiri Mix	\$	0.36
Spillage	\$	0.05
Wristband	\$	0.13
Clear Plastic Cup	\$	0.06
Total	\$	1.35
Selling at	\$	6.00
<b>Profit</b>	<b>\$</b>	<b>4.65</b>

## Pina Colada Wine Smoothie

3oz Rhumero	\$	0.75
3oz Pina Colada Mix	\$	0.54
Spillage	\$	0.05
Wristband	\$	0.13
Clear Plastic Cup	\$	0.06
Total	\$	1.53
Selling at	\$	6.00
<b>Profit</b>	<b>\$</b>	<b>4.47</b>

# Annual Expenses

(Not factored into the profits)

T.I.P.S. Training	\$200	(Five employees at \$40 each)
Additional garbage cans and liners	\$815	(5 x \$115 for cans; 10 liners/day)
Electricity	\$800	
2COP liquor license	<u>\$392</u>	
Total	\$2,207	
Liability Insurance	<u>\$3,413*</u>	
Total	\$5,620	

\*\$2,025 Base Policy; \$1,388 Assault and Battery



# Start Up Costs

(Not factored into the profits)



## EQUIPMENT:

Smoothie machine

\$1,800

# **POTENTIAL: (YES, WE ARE SUPER EXCITED ABOUT THIS!)**

<b>Beverages sold per day</b>	<b>190</b>	<b>250</b>	<b>400</b>
Beverages sold per day	190	250	400
Profit - \$4 each	\$760	\$1,000	1,600
120 Day Operating Schedule	\$91,200	\$120,000	\$192,000
Minus Fixed Annual Expenses	\$5,620	\$5,620	\$5,620
	\$85,580	\$114,380	\$186,380
Start up expense (1 <sup>st</sup> Year)	\$1,800		
First Year Revenue	\$83,780	\$114,000	\$186,380
Subsequent Years Revenue	\$85,580	\$114,000	\$186,380

## 2019 Specific Maintenance Items:

- Remove/replace old supports and cross members for the electric and power surge slides. Cost \$32,121
- Replace Pirate's Cove flooring. Cost \$49,549
- Replace bridge over family pool. Cost ~ \$10,000
- Relocate sand filters. Cost \$23,620
- Remove, dispose, and install media (sand) in existing filters. Cost \$30,020

# How the revenue benefits the park:

## PARK IMPROVEMENTS

Improve inside park amenities

- Add cabanas (frequently sell out)
- Party tent for corporate events
- Increase tables with umbrellas
- Improve any feature that will increase time spent in park

## PARK MAINTENANCE

The park is 27 years old. It is in need of maintenance.

The following areas are targeted:

- Energy saving motors/pumps
- Main stream river
- Towers and decks
- Gel coating of slides

## NEW ATTRACTIONS

Industry states that a new attraction should be added every 3-5 years to sustain the longevity of the park. If the revenue is put towards new features/attractions, it will increase attendance and in-park spending.

# Implementation Time Frame Once Approved:

## FEBRUARY 2019

- Obtain permissions, permits, licenses
- Create logistics plan for storage and security
- Order machines
- Send marketing to corporations for after hours bookings
- Order nonperishable supplies such as cups, bands, and signs
- Send marketing to corporations for after hours bookings

## MARCH 2019

- Order necessary supplies
- T.I.P.S. Training
- Hold additional alcohol related training for all employees



**QUESTIONS?**

**Item Number:** B.(2)  
**Meeting Date:** 1/28/2019  
**Item Type:** DISCUSSION

**AGENDA REQUEST FORM**  
CITY OF CAPE CORAL



**TITLE:**

Parks and Recreation Master Plan for Citywide GO Bond Park Improvements - City Manager Szerlag and Staff

**REQUESTED ACTION:**

**STRATEGIC PLAN INFO:**

1. Will this action result in a Budget Amendment?
2. Is this a Strategic Decision?
  - If Yes, Priority Goals Supported are listed below.
  - If No, will it harm the intent or success of the Strategic Plan?

**Planning & Zoning/Staff Recommendations:**

**SUMMARY EXPLANATION AND BACKGROUND:**

**LEGAL REVIEW:**

**EXHIBITS:**

Memo and attachment

**PREPARED BY:**

Division- Department-

**SOURCE OF ADDITIONAL INFORMATION:**

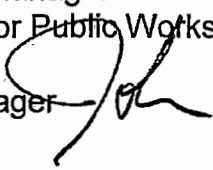
**ATTACHMENTS:**

Description	Type
<input type="checkbox"/> Memo	Backup Material
<input type="checkbox"/> Attachment	Backup Material

**MEMORANDUM**

CITY OF CAPE CORAL  
CITY MANAGER'S OFFICE

TO: Paul Clinghan, Public Works Director  
Connie Barron, Interim Assistant City Manager  
Kerry Runyon, Parks and Recreation Director  
Victoria Bateman, Finance Director  
Chris Phillips, Management/Budget Administrator  
Jay Murphy, Business Manager  
Michael Ilczyszyn, Senior Public Works Manager

FROM: John Szerlag, City Manager 

DATE: January 24, 2019

SUBJECT: Tentative Three-Year Project Budget for Parks GO Bond Issue

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Our objective is to complete all projects within our \$60 million bond issue by the end of calendar year 2021. As such, I would like a tentative three-year budget covering all revenue and expenditure categories. Of course, all capital expenditures, along with associated elements such as property acquisitions, engineering, architecture, surveying and contract administration, will be supported by bond proceeds. Once the projects are complete, any additional personnel and O&M costs must come from the General Fund. There is also a possibility of grants, but we do not budget on if-come scenarios. That said, you will need to estimate any revenues we will achieve as a result of user fees stemming from park improvements. The balance of costs will be absorbed by the General Fund.

I would also like to have:

1. Projected operational costs for an additional two years covering personnel and O&M against anticipated revenues; and
2. An update on the preliminary project management plan. Thereafter, we will provide quarterly updates and calibrate our projected budget accordingly. Please know that accelerating our projected timeframe for completion is fine with me.

JS:pd

# City of Cape Coral

## Preliminary Parks Project Management Plan

ID	Task Name	Duration	Start	Finish
1	Part 1 - Existing Park Improvements	490 days	Mon 2/4/19	Fri 12/18/20
2	RFQ for Phase 1 Prep	40 days	Mon 2/4/19	Fri 3/29/19
3	RFQ Solicitation for Phase 1 Existing Park Improvements Design Services	60 days	Mon 4/1/19	Fri 6/21/19
4	Negotiations with Contractor	40 days	Mon 6/24/19	Fri 8/16/19
5	Design Services Kickoff	0 days	Fri 8/16/19	Fri 8/16/19
6	Design Services - 30% and 60% Packages; Cost Estimates	60 days	Mon 8/19/19	Fri 11/8/19
7	Final Design 100% Package, Permit Prep	20 days	Mon 11/11/19	Fri 12/6/19
8	Permit Submittal and Approval	60 days	Mon 12/9/19	Fri 2/28/20
9	Bid Solicitation	60 days	Mon 2/3/20	Fri 4/24/20
10	Contractor Selection / Council Approval	20 days	Mon 4/27/20	Fri 5/22/20
11	Construction	120 days	Mon 5/25/20	Fri 11/6/20
12	Grand Openings	30 days	Mon 11/9/20	Fri 12/18/20
13	Part 2 - Lake Meade Park, Crystal Lake, Gator Circle, Sands Park, Tropicana Park, Oasis Woods Park	760 days	Mon 2/4/19	Fri 12/31/21
14	Tropicana Park, Oasis Woods Park	0 days	Mon 2/4/19	Mon 2/4/19
15	RFQ for Part 2 Prep	30 days	Mon 2/4/19	Fri 3/15/19
16	RFQ Solicitation for Part 2 Parks	30 days	Mon 3/18/19	Fri 4/26/19
17	Negotiations with Contactor	30 days	Mon 4/29/19	Fri 6/7/19
18	Phase 1 - Master Planning	90 days	Mon 6/10/19	Fri 10/11/19
19	Draft Master Plans	50 days	Mon 6/10/19	Fri 8/16/19
20	Master Plan Public Engagement	20 days	Mon 8/19/19	Fri 9/13/19
21	Master Plans - City Council Approvals	20 days	Mon 9/16/19	Fri 10/11/19
22	Phase 2 - Design Services & Permitting	580 days	Mon 10/14/19	Fri 12/31/21
23	30% Design and Cost Estimate Prep	60 days	Mon 10/14/19	Fri 1/3/20
24	30% Design Review Meetings and Refine	20 days	Mon 1/6/20	Fri 1/31/20
25	60% Design Prep and Cost Estimate Update	60 days	Mon 2/3/20	Fri 4/24/20
26	60% Design Review Meetings and Refine	20 days	Mon 4/27/20	Fri 5/22/20
27	Final Design and Permitting Package Prep	40 days	Mon 5/25/20	Fri 7/17/20
28	City Council Approval of Final Design	20 days	Mon 7/20/20	Fri 8/14/20
29	Permit Submittals and Approvals	50 days	Mon 8/17/20	Fri 10/23/20
30	Phase 3 - Permitting, Bidding and CA	350 days	Mon 8/31/20	Fri 12/31/21
31	Bid Solicitation	50 days	Mon 8/31/20	Fri 11/6/20
32	Contractor Selection / Council Approval	40 days	Mon 11/9/20	Fri 1/1/21
33	Construction	260 days	Mon 1/4/21	Fri 12/31/21
34	Site Prep, Demo, Grading, Utilities	50 days	Mon 1/4/21	Fri 3/12/21
35	Paving and Concrete	60 days	Mon 3/15/21	Fri 6/4/21
36	Structures and General Building	100 days	Mon 4/12/21	Fri 8/27/21
37	Power/Electrical, Communications	60 days	Mon 7/19/21	Fri 10/8/21
38	Amenities and Landscape	60 days	Mon 10/11/21	Fri 12/31/21
39	Part 3 - Yacht Club, Lake Kennedy Park, Cultural Park	760 days	Mon 2/4/19	Fri 12/31/21
40	Festival Park, Yellow Fever Preserve	0 days	Mon 2/4/19	Mon 2/4/19
41	RFQ for Part 3 Prep	30 days	Mon 2/4/19	Fri 3/15/19
42	RFQ Solicitation for Part 3 Parks	30 days	Mon 3/18/19	Fri 4/26/19
43	Negotiations with Contactor	30 days	Mon 4/29/19	Fri 6/7/19
44	Phase 1 - Master Planning	90 days	Mon 6/10/19	Fri 10/11/19
45	Draft Master Plans	50 days	Mon 6/10/19	Fri 8/16/19
46	Master Plan Public Engagement	20 days	Mon 8/19/19	Fri 9/13/19
47	Master Plans - City Council Approvals	20 days	Mon 9/16/19	Fri 10/11/19
48	Phase 2 - Design Services & Permitting	270 days	Mon 10/14/19	Fri 10/23/20
49	30% Design and Cost Estimate Prep	60 days	Mon 10/14/19	Fri 1/3/20
50	30% Design Review Meetings and Refine	20 days	Mon 1/6/20	Fri 1/31/20
51	60% Design Prep and Cost Estimate Update	60 days	Mon 2/3/20	Fri 4/24/20
52	60% Design Review Meetings and Refine	20 days	Mon 4/27/20	Fri 5/22/20
53	Final Design and Permitting Package Prep	40 days	Mon 5/25/20	Fri 7/17/20
54	City Council Approval of Final Design	20 days	Mon 7/20/20	Fri 8/14/20
55	Permit Submittals and Approvals	50 days	Mon 8/17/20	Fri 10/23/20
56	Phase 3 - Bidding and CA	350 days	Mon 8/31/20	Fri 12/31/21
57	Bid Solicitation	50 days	Mon 8/31/20	Fri 11/6/20
58	Contractor Selection / Council Approval	40 days	Mon 11/9/20	Fri 1/1/21
59	Construction	260 days	Mon 1/4/21	Fri 12/31/21
60	Site Prep, Demo, Grading, Utilities	50 days	Mon 1/4/21	Fri 3/12/21
61	Paving and Concrete	60 days	Mon 3/15/21	Fri 6/4/21
62	Structures and General Building	115 days	Mon 4/12/21	Fri 9/17/21
63	Power/Electrical, Communications	60 days	Mon 8/9/21	Fri 10/29/21
64	Amenities and Landscape	45 days	Mon 11/1/21	Fri 12/31/21

**Item Number:** B.(3)  
**Meeting Date:** 1/28/2019  
**Item Type:** DISCUSSION

**AGENDA REQUEST FORM**  
CITY OF CAPE CORAL



**TITLE:**

2017 Utilities Annual Report - Jeff Pearson, Utilities Director and Ron Cavalieri, P.E. with AECOM

**REQUESTED ACTION:**

**STRATEGIC PLAN INFO:**

1. Will this action result in a Budget Amendment?
2. Is this a Strategic Decision?
  - If Yes, Priority Goals Supported are listed below.
  - If No, will it harm the intent or success of the Strategic Plan?

**Planning & Zoning/Staff Recommendations:**

**SUMMARY EXPLANATION AND BACKGROUND:**

**LEGAL REVIEW:**

**EXHIBITS:**

Memo  
2017 Utilities Annual Report  
Staff Presentation

**PREPARED BY:**

Division- Department-

**SOURCE OF ADDITIONAL INFORMATION:**

**ATTACHMENTS:**

Description	Type
<input type="checkbox"/> Memo	Backup Material
<input type="checkbox"/> 2017 Annual Report	Backup Material
<input type="checkbox"/> Staff Presentation	Backup Material

**MEMORANDUM**

CITY OF CAPE CORAL  
CITY MANAGER'S OFFICE

TO: Mayor Coviello and Council Members  
FROM: John Szerlag, City Manager  
Jeff Pearson, Utilities Director  
DATE: January 23, 2019  
SUBJECT: Utilities Annual Report-Committee of the Whole (COW) Meeting Presentation

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Mr. Ron Cavalieri, P.E. with AECOM and Mr. Jeff Pearson, Utilities Director will provide a power point presentation regarding the Utilities Annual Report to City Council at the January 28, 2019 Committee of the Whole (COW) Meeting scheduled for January 28, 2019.

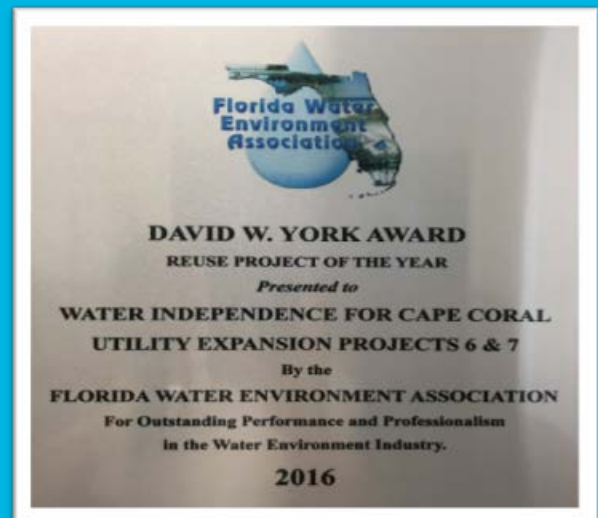
The purpose of the Utilities Department Annual Report is to comply with Section 5.18 of the City of Cape Coral, Florida, Water and Sewer Refunding Revenue Bonds. The Report includes an assessment of the ability of the City's Utility System to meet anticipated service demands and an estimate of the amount of revenue necessary for such purpose.

The report is for informational purposes only, no formal action is required by City Council.

Please let me know if you have any questions regarding the attached report. Mr. Pearson can be at 239-574-0709.

Attachment: Utilities Annual Report & Power Point Presentation

# CITY OF CAPE CORAL FLORIDA FISCAL YEAR 2017 ANNUAL REPORT



Submitted to: City of Cape coral  
Submitted by: AECOM Technical Services, Inc.  
4415 Metro Parkway Suite 404  
Fort Myers, FL. 33916  
September 2018

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## Executive Summary

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The City of Cape Coral is a vibrant waterfront community located in Lee County, Florida, on the Gulf of Mexico. As a City with the vision of being a center of opportunity in the Southwest Florida region, it strives to provide well-managed and efficient potable water, wastewater and irrigation quality water services to its customers.

Tasked with reviewing and reporting on the City of Cape Coral's operation of the potable water, wastewater and irrigation quality water systems, herein referred to as the Utility System, AECOM Technical Services, Inc. (Consulting Engineer) has assessed that the City can provide excellent reliable service to its customers. The City's Utility Department and staff regularly evaluate current and future system needs and develop plans and strategies to implement needed infrastructure improvements, which will support future customer service. The City's Utility Department and staff operate on a daily basis with the objective of meeting the mission statement below:

*"Continue to improve our delivery of cost-effective water, irrigation water and wastewater collection services by empowering employees to responsively meet customer expectations for quality, value, safety, reliability and environmental responsibility."*

Submitted herein is the Consulting Engineer's Annual Report, which addresses the operations, maintenance and condition of the City's Utility system in accordance with Section 5.18 of the City of Cape Coral, Florida, Water and Sewer Refunding Revenue Bonds, Series 2015. Section 5.18 requires that the consulting engineers for the Utility Department inspect and review the operation, maintenance and repair of the Utility System, and to report to the City with their recommendations and comments. In addition, included herein are discussions of the management of the Utility System, rates and charges, and capital improvements.

This FY 2017 Annual Report documents findings related to the operation, maintenance and repair of

the Utility System for the fiscal year ending September 30, 2017. The Report includes an assessment of the ability of the Utility System to meet anticipated service demands and an estimate of the amount of revenue necessary for such purpose. This Annual Report finds that the potable water, wastewater and irrigation quality water systems have been maintained in good condition and are operated in an efficient manner at a reasonable cost as noted below:

- The City is able to meet operations and maintenance obligations through its established rates, and produce the required net revenues, expansion fees and special assessment proceeds.
- The Utility System is maintained and operated in an efficient and economical manner, and that renewal and replacement expenditures are proper.
- The disposition of revenues is in accordance with all bond covenants.
- The City has exceeded the minimum debt service coverage requirements as required by the Bond Resolution.
- The facilities insurance requirements are adequate.

Based on Consulting Engineer's review of the Fiscal Year 2017 financial information for the potable water, wastewater and irrigation quality water systems, the systems have complied with applicable covenants of the 2015 Series Bonds, including preparing an annual budget, maintaining sufficient rates, and providing adequate funds for proper operation and maintenance.

The facilities, operations and management as positioned and planned for, are adequate to meet the forecasted demands due to customer growth.



## Chapter 1 Introduction

### 1.1 BACKGROUND

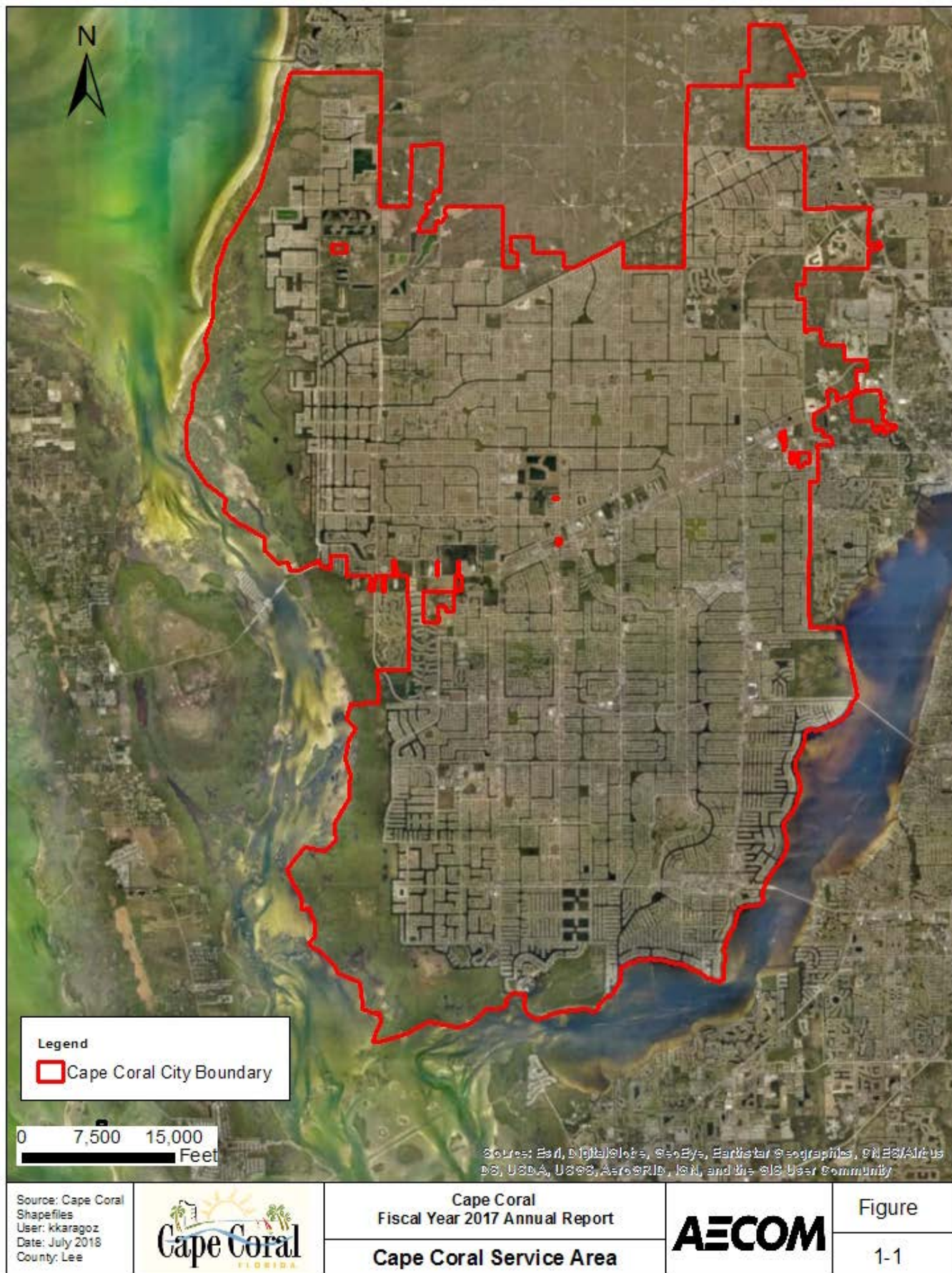
The City of Cape Coral is located in southwest Florida, approximately 120 miles south of Tampa and extends over an area of more than 76,000 acres. The City is located on a large peninsula developed with over 400 miles of fresh and salt water interconnected canals leading to the Gulf of Mexico and its tributaries. Out of a total area of 120 square miles, the City contains almost 10 square miles of water. It is bordered in the south and east by the Caloosahatchee River, in the west by Matlacha Pass, and is connected to the Florida mainland in the north by Charlotte County and North Fort Myers. Across the Caloosahatchee River lies the City of Fort Myers, and located across Matlacha Pass is Pine Island and Matlacha. An aerial image of the City of Cape Coral is presented in **Figure 1-1**.

The City's subtropical climate, characterized by mild weather throughout the year along with its network of canals, extending over 400 miles, attracts seasonal residents to stay during the winter months, which has resulted in Cape Coral becoming a popular vacation

and retirement community. The latest US Census data shows that Cape Coral's year round population is 175,229. The population of Cape Coral has increased approximately 14 percent since the 2010 Census.

The City of Cape Coral owns and operates potable water, wastewater, and irrigation quality water systems. The potable water system includes 55 raw water supply wells, 28 miles of raw transmission mains, the Southwest Reverse Osmosis WTP with a permitted capacity of 18.1 MGD, the North Reverse Osmosis WTP with a permitted capacity of 12 MGD Reverse Osmosis WTP, deep injection wells for concentrate disposal, two storage and re-pump stations, and 907 miles of potable water mains.

The wastewater system includes 734 miles of gravity sewers, 11,659 manholes, 300 lift stations, 203 miles of force mains, two water reclamation facilities, and an irrigation system for effluent disposal by water reuse of reclaimed water. The two water reclamation facilities are the Everest Parkway Facility, with a permitted capacity of 13.4 MGD, and the Southwest Facility with a permitted capacity of 15.0 MGD.



The irrigation quality water system includes 790 miles of mains, five canal pump stations, five storage tanks and 14 reuse pumps located between the water reclamation facilities.

## 1.2 PURPOSE

The City of Cape Coral must comply with Section 5.18 of the City's Water and Sewer Refunding Revenue Bonds, Series 2015, which requires that an Engineering Report for the potable water, wastewater and irrigation quality water systems be prepared every three years. In order to comply with the City's Bond Covenants, AECOM Technical Services, Inc. was retained by the City of Cape Coral to serve as the City's representative Consulting Engineer for preparation of an Annual Report for the fiscal year ending September 30, 2017 (FY 2017).

The purpose of this report is to comply with Section 5.18 of the City of Cape Coral, Florida, Water and Sewer Refunding Revenue Bonds, Series 2015, as quoted below:

***"The Issuer shall employ Consulting Engineers, whose duties shall be to make any certificates and perform any other acts required or permitted of the Consulting Engineers under this Resolution, and also review the construction and operation of the System, to make an inspection of the system ... to submit to the Issuer a report with recommendations as to the proper maintenance, repair and operation of the System, including recommendations for expansion and additions to the System to meet anticipated service demands, and an estimate of the amount of money for such purposes... The Consulting Engineer shall, from time to time, recommend the amount of Renewal and Replacement Fund Requirement..."***

## 1.3 SCOPE OF SERVICES

A scope of services was developed to address the requirements of the Annual Report. The scope includes a review of the operation, maintenance and repair of the Utility System, a financial review and a rate covenant compliance analysis.



## Chapter 2 Organization and Management

### 2.1 INTRODUCTION

The City of Cape Coral operates under a Council/Mayor form of government with the assistance of supporting personnel. City Council members and the Mayor are elected at large from seven districts and meet every other Monday for meetings in Council Chambers. The City Manager is appointed by the Mayor and Council and is responsible for supervising, directing and coordinating the activities of City business, as well as preparing the annual budget and advising the Council. The City Clerk is responsible for record keeping while accounting is the responsibility of the City Financial Services Department. The Utilities Director is responsible for coordination, management and administration of the City's potable water, wastewater and irrigation quality water systems (Utility System). The City Attorney is in charge of providing legal advice regarding City business, as well as matters regarding the Utility. Other City personnel including, engineering, human resources, as well as financial services, assist in the planning and operation of the Utility System.

### 2.2 CITY COUNCIL AND ADMINISTRATION

The City Council consists of the Mayor and seven District Representatives who are elected at large by the citizens of Cape Coral to serve four-year terms. The City Council is responsible for ratifying ordinances and resolutions regarding Utility System service, and approving rates, charges and budgets and revisions thereto.

The City Manager is responsible for assisting the City Council and for the administration on the day-to-day affairs of the City coming under the City Manager's jurisdiction. The City Manager assists in budget and document preparation; informs the City Council of the City's financial status; supervises departments and offices of the City of Cape Coral Council and government; and appoints the directors of the ten (10) established departments.

The Utilities Director supports the City Manager in the administration of the affairs of the City's Utility Department. The Utility Director oversees the administration of the Utility Department as well as assists with the preparation of the annual budget, budget documentation and overall management of the Utilities Operations.

The Utilities Department record keeping and accounting are the responsibilities of the City's Financial Services Director, who is also responsible for assistance in the administration of the City's business.

### **CITY UTILITIES DEPARTMENT**

The Utilities Department is subdivided into four divisions, which are Administration, Water Production, Water Reclamation, and Collection/Distribution. The Department is managed by the Utilities Director who with support staff from each division work to continuously improve the delivery of high quality cost-effective potable water, wastewater, and irrigation quality water services to customers.

### **ADMINISTRATION**

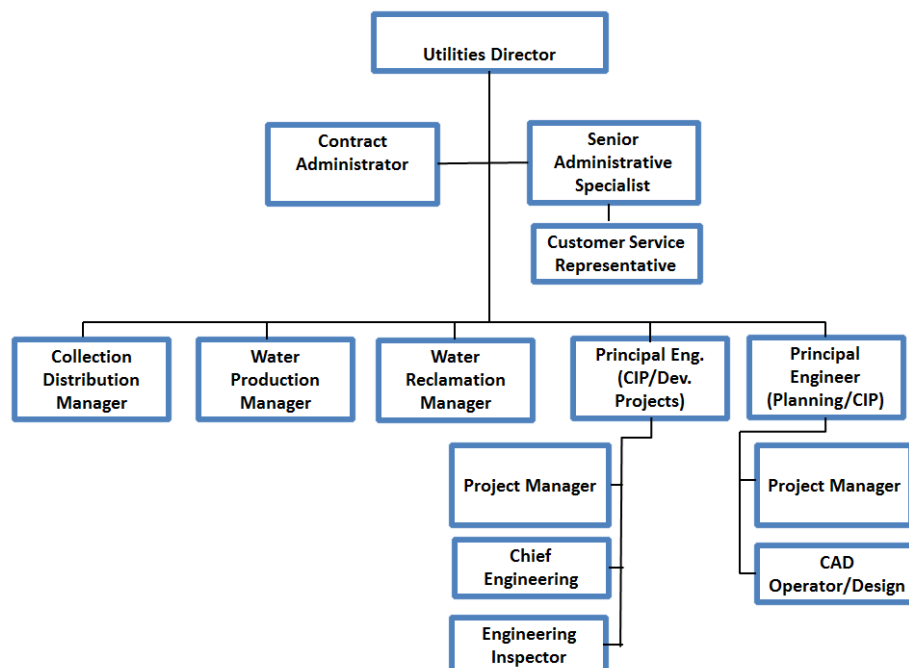
The Utilities Administration (refer to **Figure 2-1**) manages the overall utility operations and holds responsibility for the management of capital assets and the development of long term plans. These plans are then implemented by the Utilities Administration, through the appropriate utility construction projects, to provide for existing and future customer utility services. Other responsibilities of the Utilities Administration include; the preparation of permitting applications, grant applications and inter-local agreements; and the review and oversight of development projects.

### **2.3 UTILITIES COLLECTION / DISTRIBUTION DIVISION**

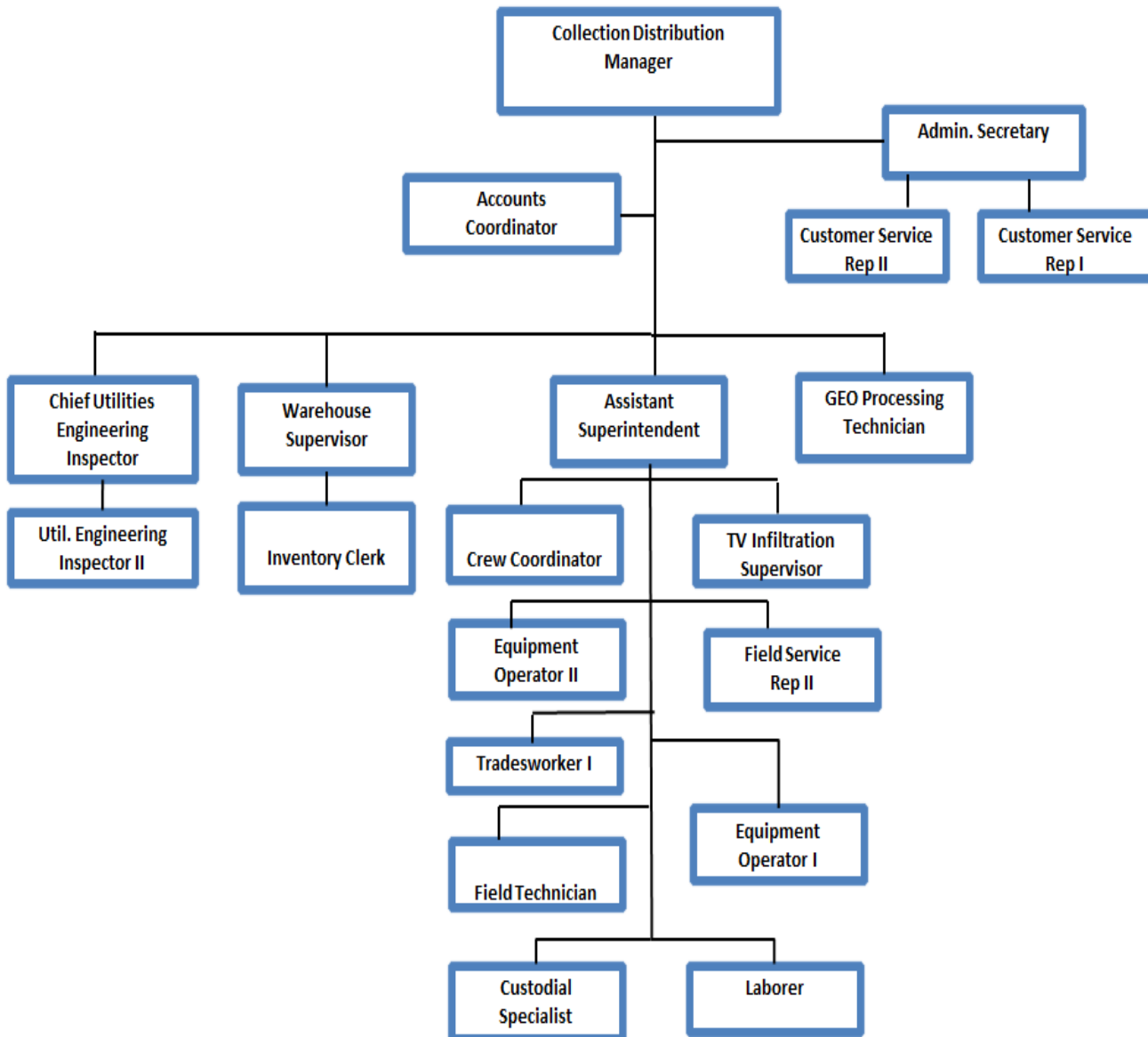
The Utilities Collection/Distribution (UCD) Division is comprised of approximately 101 positions divided into four (4) staff groups including Administration, Field Operations, Inspections/Review, and Warehouse, as indicated in **Figure 2-2**. The UCD Division holds responsibility for the operation and maintenance on components of the Utility System.

The UCD Division implements an ongoing training program in order to maintain a team that demonstrates complete knowledge of the safe operation of equipment required for routine maintenance and emergency repairs. In order to provide the City with a trained UCD Division staff, certifications and licensing through training programs are made a priority. Currently, various staff hold Intermediate FDOT MOT Certifications, Class A or B Commercial Driver's Licenses, Backflow Testing and Repair Certifications, various Water Distribution System Operator's licenses, Waste Water Certifications (A/B/C), and Advanced FDOT MOT Certifications. Other training programs include Confined Space Entry, Trenching and Shoring, Trench Rescue/Recovery and Equipment Operator Certification.

**Figure 2-1 Utilities Administration Organizational Chart**



**Figure 2-2 Collection/Distribution Division  
Organizational Chart**



The operation and maintenance of approximately 28 miles of raw water transmission mains, 907 miles of potable water mains, 96,087 service connections, 4,362 potable water fire hydrants and 63,014 meters is included in the Water Distribution System upkeep. The UCD Division also holds responsibility for repairing leaks and major line breaks, new installations, existing line inspections, meter testing and change outs, hydrant maintenance, service turn on/off's, service connection inspections, handling emergencies, restorations following repairs and addressing customer concerns.

The wastewater collection system requires operation and maintenance of approximately 734 miles of gravity sewer mains, 203 miles of force mains, 51,412 service laterals and 11,659 manholes. The repair of any leaks and major line breaks, new installations, existing line inspections and manhole repairs and restorations are included in the wastewater collection system upkeep.

The operation and maintenance of approximately 790 miles of irrigation quality water distribution mains, 65,674 service laterals and 863 fire hydrants is part of the irrigation quality water distribution system upkeep. It has been reported by the City, that the number of

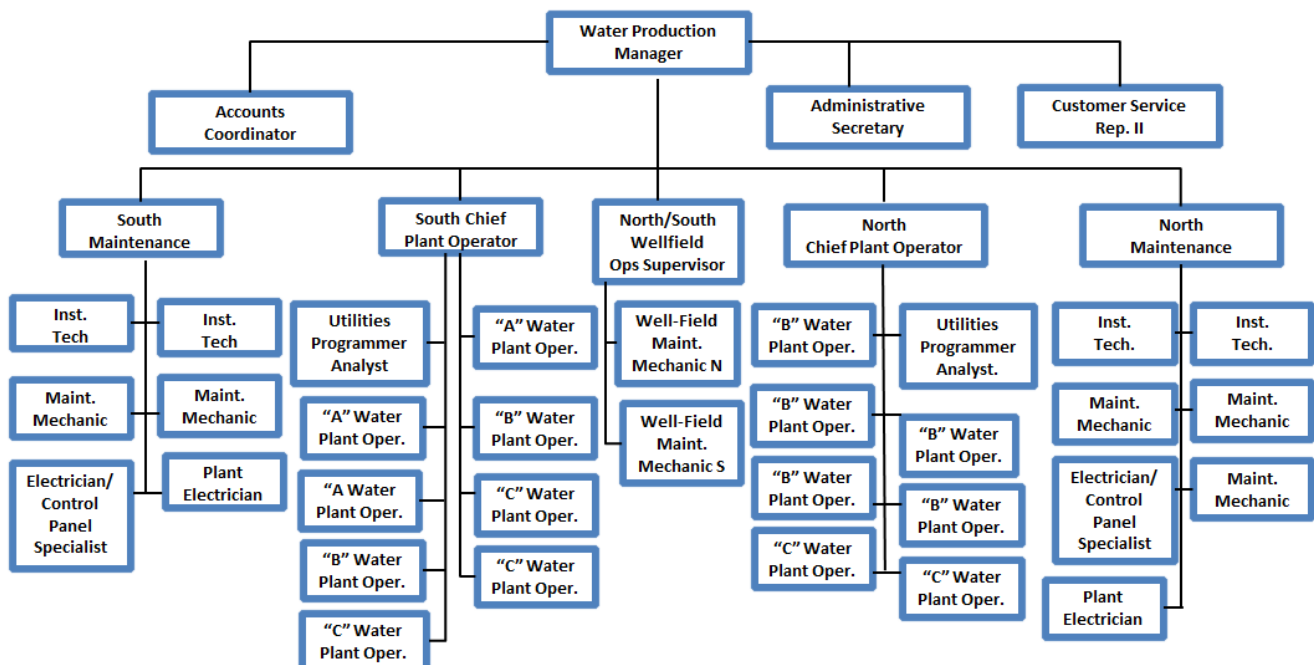
service connections exceeds the number of customers due to empty lots and customers with multiple services.

## 2.4 WATER PRODUCTION DIVISION

The Water Production Division has responsibility for producing potable water that meets or exceeds all Safe Drinking Water Standards established by the Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP). To meet those standards, the Division is responsible for operation and maintenance of the overall potable water system, including 55 raw water wells, two offsite storage and re-pump stations, and the two Water Treatment Plants. However, the UCD Division is responsible for the raw water transmission and potable water distribution mains.

The Division is comprised of approximately 42 positions (as indicated in **Figure 2-3**) with 17 being state certified water treatment plant operators. This staffing arrangement is in compliance with the requirements for the operation of a Category II, Class A facility as outlined in the Florida Administrative Code (FAC) Chapter 62-699.

**Figure 2-3 Water Production Division Organizational Chart**



## 2.5 WATER RECLAMATION DIVISION

The Water Reclamation Division is responsible for operation, maintenance and regulatory reporting required for treating wastewater to meet or exceed all standards established by the EPA and FDEP required for reuse in the City's irrigation quality water distribution system, disposal via deep injection, or discharge into the Caloosahatchee River, if needed.

The Division (as shown in **Figure 2-4**) is comprised of approximately 71 positions, with 21 of those personnel being state certified wastewater treatment plant operators. The facilities are staffed at all times with a Class C or higher certified operator, which satisfies the approved requirements outlined in the FAC Chapter 62-699, to operate the Category I Class A facilities.

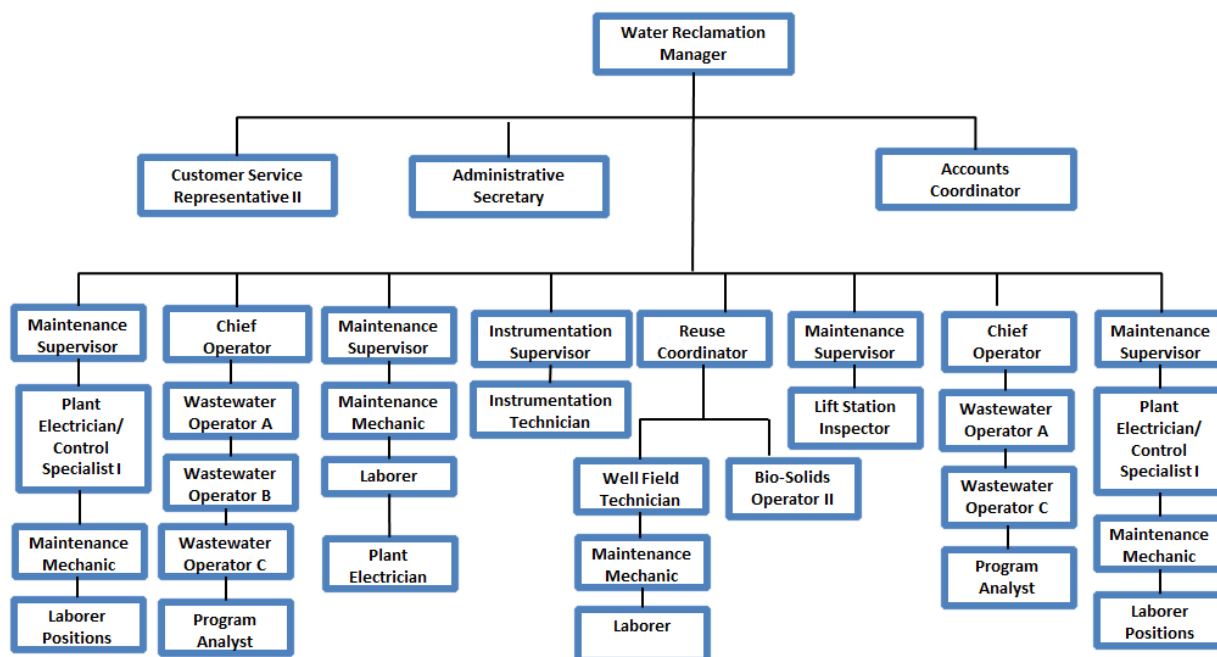
## 2.6 LEGAL COUNSEL

The City Council appoints the City Attorney who acts as a general legal counsel in all legal matters, including the potable water, wastewater and irrigation quality systems for the City.

## 2.7 CONSULTING ENGINEER

The City has retained AECOM Technical Services, Inc. as Consulting Engineer to prepare the FY 2017 Annual Report for the City concerning Utility System matters in pursuant to Section 5.18 of the City of Cape Coral, Florida, Water and Sewer Refunding Revenue Bonds, Series 2015.

**Figure 2-4 Water Reclamation Division Organizational Chart**





## Chapter 3 Potable Water System

### 3.1 GENERAL OVERVIEW OF POTABLE WATER SYSTEM

The City's Potable Water System includes: raw water supply wells; raw water transmission mains; two potable water treatment facilities; two potable water storage and pumping facilities; and a potable water transmission and distribution network. The City's potable water transmission and distribution lines are maintained by the UCD Division, with the remaining facilities operated and maintained by the Water Production Division.

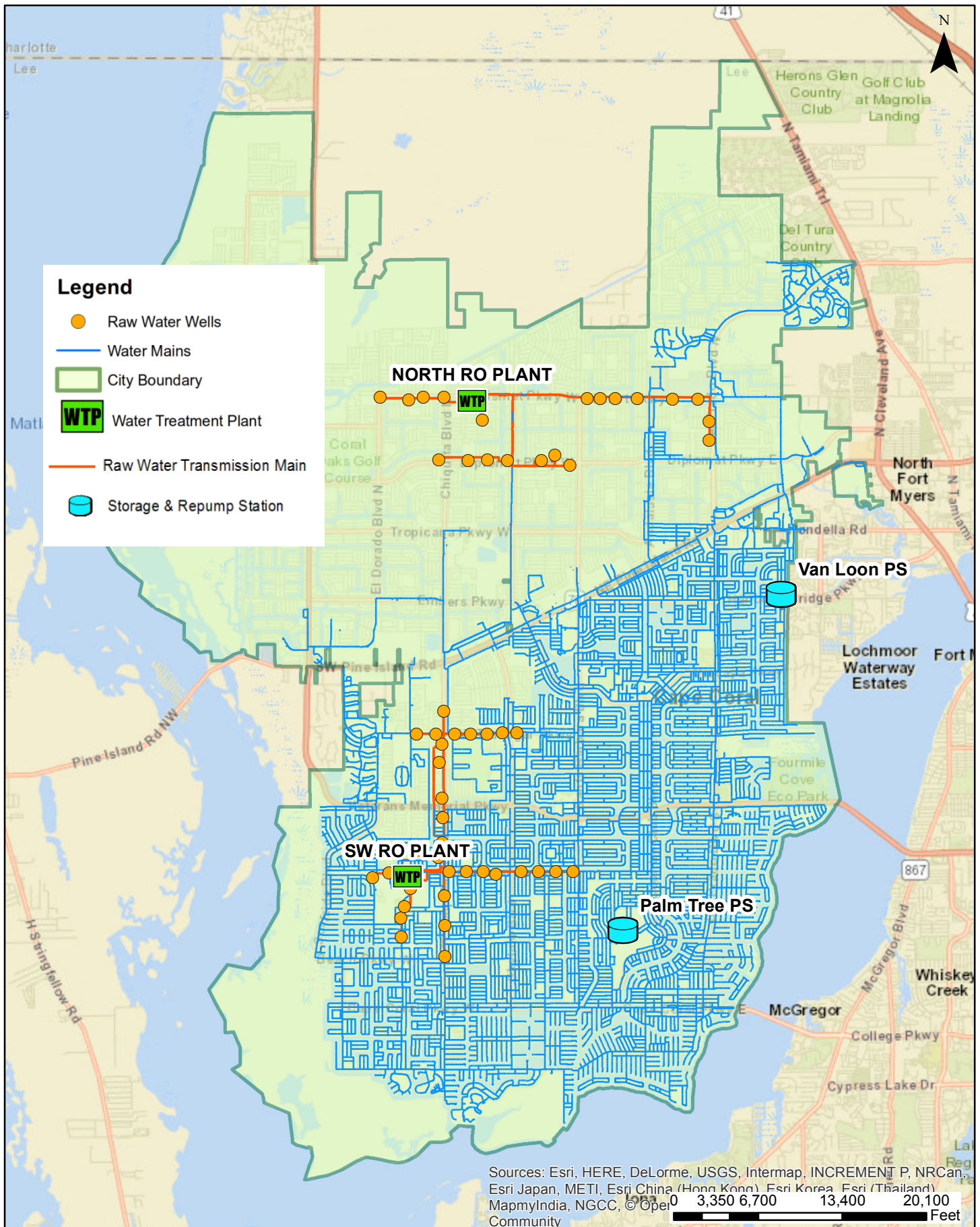
Treatment, storage and pumping facilities owned and operated by the City include: The Southwest Reverse Osmosis Water Treatment Plant (SW RO WTP), the North Reverse Osmosis Water Treatment Plant (North RO WTP), and the Van Loon and Palm Tree Storage and Re-Pump Stations. A map of the City's potable water system is shown in **Figure 3-1**.

The following sections provide a general description of the City's Potable Water System and document the current conditions based upon a review of available information and discussions with key staff.

### 3.2 RAW WATER SUPPLY

The City's potable water production facilities are supplied with brackish raw water from the Upper Floridan Aquifer. There are a total of 55 wells. The two plants that make up the Southwest RO WTP receive water from 33 wells. Plant #1 at the Southwest RO WTP is supplied by 12 production wells; Plant #2 at the Southwest RO WTP is supplied by 21 wells; and the North RO WTP is supplied by 22 production wells. Each wellfield supplies water to its respective water treatment facility through an independent raw water transmission system. Currently three of the wells supplying raw water to the Southwest RO WTP and one of the wells supplying raw water to the North RO WTP are out of service due to high total dissolved solids (TDS). Throughout FY 2017, regular maintenance, repairs, and replacement of well components were performed on the wells.

The production rates of the 55 production wells range from 250 gallons per minute (GPM) to 750 GPM with a combined total pumping rate of approximately 39 MGD. The operation and maintenance of raw water supply wells is controlled and performed by the Water Production Division.



Typically each year, under an ongoing proactive maintenance program, refurbishment work is performed by City staff as needed, which may include: meter calibration, new butterfly valves, and wellhead painting and improvements. In addition to this ongoing maintenance, a well rehabilitation program is being finalized, where approximately three wells per plant per year are planned for acidification. An outsourced well contractor, under the oversight of a consulting professional hydrogeologist, will be acidizing wells as needed and/or recommended. This program is important because under normal operating conditions, and over time, most wells will gradually lose a portion of their production capacity and require cleaning of the well screen and acidification of the interface with the aquifer to restore specific capacity. Wells are refurbished on a specific capacity and drawn down basis. Wells that have a drop in flow of 200 GPM or a drawdown of over 90 feet are flagged for refurbishment.

Based on a review of the raw water supply, the system is in generally good condition and provides an adequate supply of raw water for production requirements without the need to expand at this time. However, some production wells in the North and South Wellfield are experiencing higher than expected rates of increased chloride and TDS levels than was originally projected at this point in time. This is more of a concern in the North Wellfield due to a higher amount of geological variation in the Upper Floridan Aquifer in that area. Currently, an update to the Hydrogeologic Model is under way, and when completed, will provide more detailed data on the geology of this area, to help best determine how to address the wells with decreasing water quality. The steps in addressing these wells may include: back-plugging, plug and abandonment, conversion to a monitor well, and replacement with a new well in a different location. If replacement wells need to be drilled, the updated Hydrogeologic Model will assist the City with selecting the best possible location for these wells. Future upgrades to existing wells include: wellfield communications, controls, and electrical service. Also, additional raw water wells will be needed in the future to meet buildout demands.

### 3.3 RAW WATER MAINS

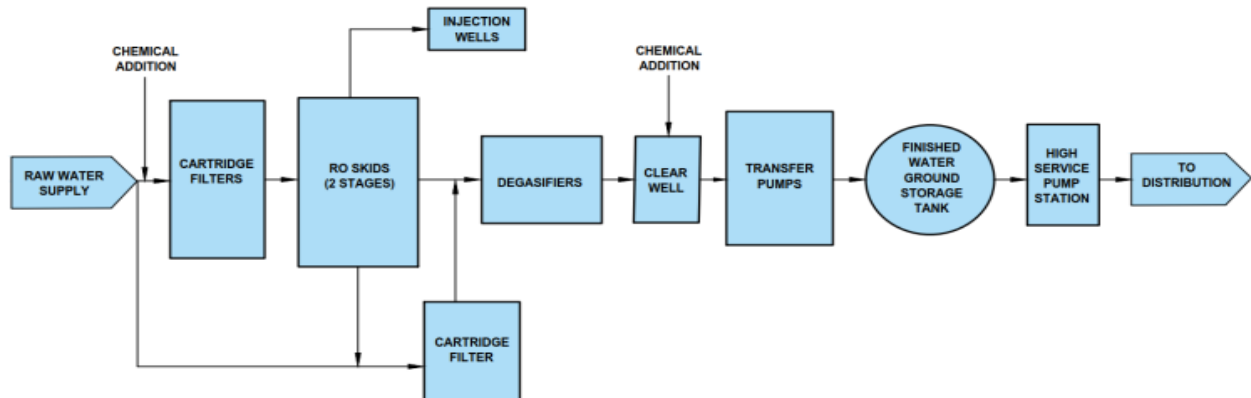
The UCD Division currently maintains approximately 28 miles of raw water transmission mains which transport raw water from the 55 RO supply wells to the Southwest RO WTP and the North RO WTP. A review of the UCD Division operation and maintenance indicates that the City's raw water mains (constructed primarily of epoxy lined ductile iron or polyvinyl chloride) are well maintained and in good physical condition. No improvements or expansions appear to be necessary at this time. The ongoing regular maintenance and upgrade programs are recommended to continue in order to maintain the transmission systems in a good and reliable condition.

### 3.4 NORTH REVERSE OSMOSIS (RO) WTP

Construction of the North RO WTP facility began in FY 2006 and was completed in FY 2010. The facility is a two stage RO process and has a current permitted capacity of 12 MGD. The WTP has a firm capacity of 9 MGD with one unit out of service. Approximately 14.5 MGD of raw water produces 12 MGD of finished water and 2.5 MGD of concentrate requiring disposal. A treatment process block diagram for the North RO WTP is presented in **Figure 3-2**.

The majority of the WTP infrastructure is constructed of reinforced concrete to protect against storms and to meet current building codes. The Plant's Operations/Control Center, High Service Pump Building, Maintenance Building, Generator and Electrical Buildings have sufficient area for future equipment expansion needed to meet buildout conditions. With a total of 24,000 square feet, the existing Process Building is capable of meeting the facility's needs through expansion to between 24 and 30 MGD, and vacant area on site has been reserved for future expansion of the building to meet the 36 MGD build-out capacity. Therefore, the system treatment process will be able to stay on line with minimal disruption during future plant upgrades.

The raw water for the treatment process is provided by 22 wells. The wellfield supplies water to the North RO WTP through an independent raw water transmission system. The wells draw their water from the Upper Floridan Aquifer. The rate of supply varies and is closely monitored.

**Figure 3-2. North RO WTP Process Flow Diagram**

Raw water from the wellfield undergoes pretreatment using sulfuric acid, polyacrylic acid and filtration. The sulfuric acid reduces the water's pH, while the polyacrylic acid is added as a scale inhibitor. Flow through a five-micron cartridge filter allows for removal of any materials that can otherwise damage the membranes. This cost effective pretreatment procedure was adopted based on the City's experience operating the City's Southwest RO WTP for meeting water quality performance standards at a reasonable treatment cost while extending the life of the membrane elements.

Following pretreatment, pressurized feed water is conveyed to each of four parallel treatment (production) trains. Each train has a dedicated 400 horsepower pump and a production capacity of 2.5 MGD. Each membrane treatment train is a two stage system with the first stage having 48 pressure vessels which can be expanded to 54 pressure vessels and the second stage having 24 pressure vessels which can be expanded to 27 pressure vessels. With the feed water under pressure, purified water is allowed to pass through the filter membranes, and the concentrate from the first stage becomes feed for the second. Approximately, 100 gallons of raw water is treated to produce approximately 80 gallons of product water. The 80 gallons of product water from both stages is blended with approximately 20 gallons of raw water to add back minerals to meet target water quality parameters and improve the taste of the drinking water. Overall, it takes 120 gallons of raw water to produce 100 gallons of blended product water. The use of blended water provides significant cost savings since approximately 20% of the finished water is raw water that does not pass through the membrane process and there is a reduction in chemical treatment

needed for adding alkalinity and stabilizing the water for corrosion treatment.

Post treatment follows the primary RO treatment. Blended product water is post treated for the removal of gases such as hydrogen sulfide and carbon dioxide using stripping towers. After the degasification system, the blended product water enters a 170,000 gallon clearwell where sodium hydroxide (caustic soda) is added to attain desired pH. The product water is then disinfected using sodium hypochlorite (bleach) and pumped to the 12 MG prestressed concrete ground storage tank by means of three (two duty, one standby) 100 horse power (HP) transfer pumps. The chlorine levels are monitored closely to ensure successful disinfection and final samples are taken daily to ensure adequate disinfection.

Water from the ground storage tank on site is pumped into the City's potable water distribution system using four pumps located at the High Service Pump Station. This pump station has a total capacity of 22,500 GPM.

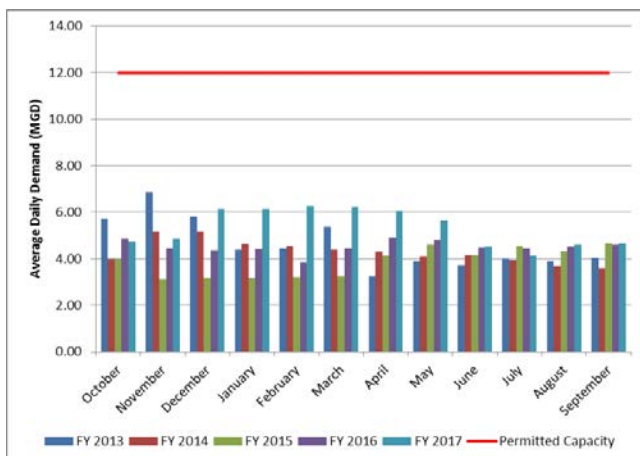
Power to the North RO WTP is supplied by Lee County Electric Cooperative (LCEC). In addition, there are two 2,250 KW diesel generator units located at the Plant, each having sufficient capacity to power 100% of the process equipment at its current constructed capacity. The North RO WTP participates in a load shed program with LCEC during peak power demand times on their system. There are also portable diesel generators that provide standby power at the production well sites. Therefore, this Plant meets FDEP and FAC requirements for auxiliary power noted in Chapter 62-555.

One on-site deep injection well is used for the disposal

of concentrate water. At the North RO WTP there is presently no back-up disposal method in case of failure of this injection well, however, the Southwest RO WTP is able to supply the City with water during periods of regulatory agency mandated testing or other maintenance activity which would take the North RO WTP well offline. The City staff has plans to evaluate the construction of a second deep injection well to provide a back-up disposal method that will allow this facility to remain on-line at all times.

The North RO WTP water production flow data for FYs 2013-2017 is summarized in the **Table 3-1** and **Figure 3-3**.

**Figure 3-3. Potable Water Demand FY 2013 – FY 2017 North RO Plant**



As shown in **Table 3-1** and **Figure 3-3** the water production rates at the North RO plant vary month to month and year to year. Any significant increases/decreases in production at this Plant are typically offset by production at the Southwest RO WTP during the same period. Production rates vary between the North RO Plant and the Southwest RO Plant depending on planned major maintenance, equipment failures, or unexpected high demand due to providing water to the water reclamation plants for the irrigation system.

The North RO WTP production is currently well under the plant's permitted capacity of 12 MGD and it will meet future demands associated with additional phases of the Utility Expansion Program. Construction of utilities to Utility Expansion Areas denoted as SW 6 & 7 is complete and the City's potable water treatment and distribution systems meet the new demand. The City has completed planning and engineering studies to evaluate needed improvements to the existing

water, wastewater and reclaimed water systems to service future areas North 1 and North 2. The Study completed in February 2016 entitled "City of Cape Coral Water, Wastewater and Irrigation Facilities Update" documented that the two existing water production facilities have a combined capacity of 30.1 MGD, which is more than adequate to treat the additional potable water demand (approximately 3.8 MGD) from the North 1 and North 2 UEP areas at buildout condition. The North 2 Area Utility Expansion will be complete by the end of Year 2019 and the North 1 Area Expansion will be complete by the end of Year 2020.

The North RO Plant received the Outstanding Membrane Plant Award for Plants greater than 5 MGD for the Southeast Desalting Association (SEDA) in 2016. This award is in recognition of outstanding plant operations, maintenance and exemplary membrane treatment plant performance.

**Table 3-1 Historical Water Demand Data – North RO Plant**

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2013</b>			
Oct-12	5.73	7.57	3.03
Nov-12	6.86	7.90	5.56
Dec-12	5.82	7.58	3.18
Jan-13	4.41	5.66	3.51
Feb-13	4.46	5.24	3.29
Mar-13	5.39	8.76	4.05
Apr-13	3.24	5.00	0.00
May-13	3.88	5.08	1.38
Jun-13	3.70	4.24	1.20
Jul-13	4.02	4.40	3.58
Aug-13	3.89	4.76	3.24
Sep-13	4.04	5.35	3.27
<b>FY 2014</b>			
Oct-13	3.98	4.80	3.29
Nov-13	5.16	6.77	3.97
Dec-13	5.18	6.97	3.35
Jan-14	4.62	5.30	3.73
Feb-14	4.55	5.38	3.66
Mar-14	4.40	5.80	2.66
Apr-14	4.29	4.71	3.3

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2014</b>			
May-14	4.10	5.03	3.08
Jun-14	4.15	4.81	3.54
Jul-14	3.96	4.45	3.33
Aug-14	3.67	4.35	2.89
Sep-14	3.60	5.30	2.67
<b>FY 2015</b>			
Oct-14	3.98	6.45	2.12
Nov-14	3.11	3.40	2.79
Dec-14	3.18	3.47	2.77
Jan-15	3.18	3.70	2.70
Feb-15	3.21	3.61	2.70
Mar-15	3.24	3.49	3.03
Apr-15	4.13	5.14	2.77
May-15	4.61	6.32	3.06
Jun-15	4.16	5.07	3.50
Jul-15	4.55	5.00	3.27
Aug-15	4.35	5.15	2.78
Sep-15	4.67	5.43	3.00
<b>FY 2016</b>			
Oct-15	4.87	5.49	3.88
Nov-15	4.46	5.14	3.34
Dec-15	4.35	5.13	1.07
Jan-16	4.43	5.00	3.71
Feb-16	3.84	5.35	1.32
Mar-16	4.44	6.39	3.34
Apr-16	4.89	6.28	3.95
May-16	4.81	5.89	4.03
Jun-16	4.48	5.26	3.45
Jul-16	4.46	5.07	3.79
Aug-16	4.51	5.42	3.43
Sep-16	4.61	5.59	4.07
<b>FY 2017</b>			
Oct-16	4.71	5.13	4.19
Nov-16	4.88	5.36	4.43
Dec-16	6.16	7.18	5.03
Jan-17	6.16	7.00	5.51
Feb-17	6.27	6.85	5.17
Mar-17	6.24	7.25	5.15
Apr-17	6.06	7.17	3.29
May-17	5.65	6.69	4.66
Jun-17	4.51	5.06	3.77
Jul-17	4.14	5.44	1.13
Aug-17	4.61	7.80	2.74
Sep-17	4.67	6.66	3.09

### 3.5 SOUTHWEST (SW) RO WTP

The SW RO WTP is an 18.1 MGD facility which consists of two plants. The facility was originally constructed in 1977 as the first of its kind, and was originally a 3 MGD facility. In 1980 and 1985, its treatment capacity was expanded from 3 to 6 MGD and then 6 to 15 MGD with the addition of Plant 2. The Plant was then modified to expand treatment capacity from 15 to 18.1 MGD in 2008. In March 2017, a new maintenance building that provides additional work areas and enclosed storage for material, vehicles and equipment was completed. Structural reinforcement of the existing Plant #1 pump and control building was completed in May 2017 to enable the facility to resist higher wind loads.

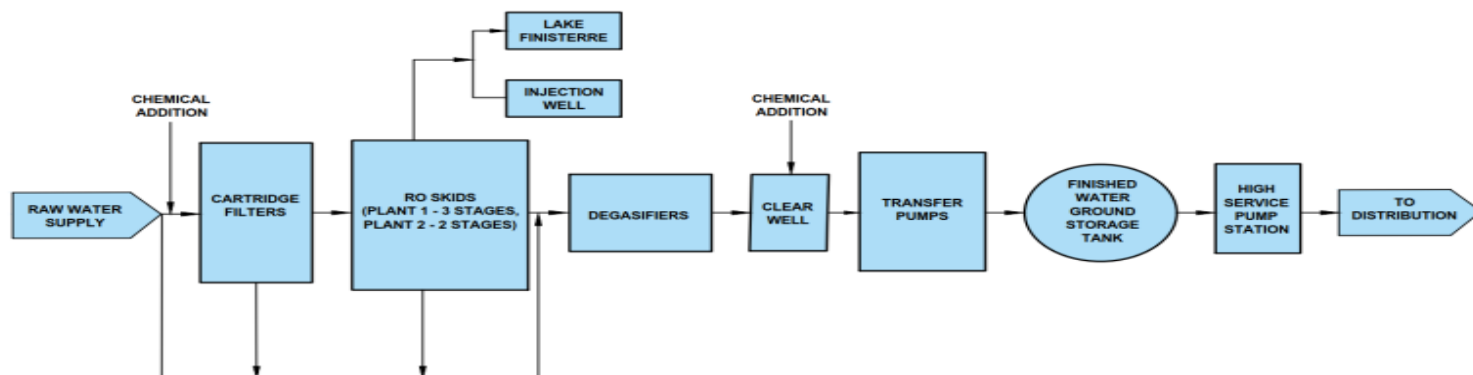
Plant #1 is a three stage reverse osmosis (RO) process and Plant #2 is a two stage RO process. Both Plants provide a current permitted capacity of 18.1 MGD. Approximately 21.5 MGD of raw water produces 18.1 MGD of finished water and 3.4 MGD of concentrate requiring disposal. A treatment process block diagram for the Southwest RO WTPs is presented in

**Figure 3-4.**

Raw-water for the treatment process is provided by 12 wells at Plant #1 and 21 wells at Plant #2. The wells draw their water from the Upper Floridan Aquifer. The rate of supply varies and is closely monitored. The water is tested regularly and the water's physical and chemical characteristics are recorded for operational purposes.

The pre-treatment process for both Plants consists of filtration and chemical adjustment. Sulfuric acid is added to reduce the pH of the water and polyacrylic acid is added as a scale inhibitor. Particulates in the raw water supply are physically removed through cartridge filters (5 micron).

Pressurized raw-water is conveyed to the reverse osmosis (RO) process where purified water is produced. The process occurs in stages (3 stages, 10 trains at Plant #1 and 2 stages, 8 trains at Plant #2) where the rejected concentrate is processed again to produce more purified water. Each treatment train at Plant #1 consists of 10 first stage pressure vessels, seven second stage pressure vessels, and four third stage pressure vessels. Plant #2 consists of 20 first stage pressure vessels and 10 second stage pressure vessels. At Plant #1, 100 gallons of raw water produces 75 gallons of product water which is blended with 17 gallons of raw water to produce 92

**Figure 3-4. Southwest RO Plant Process Flow Diagram**

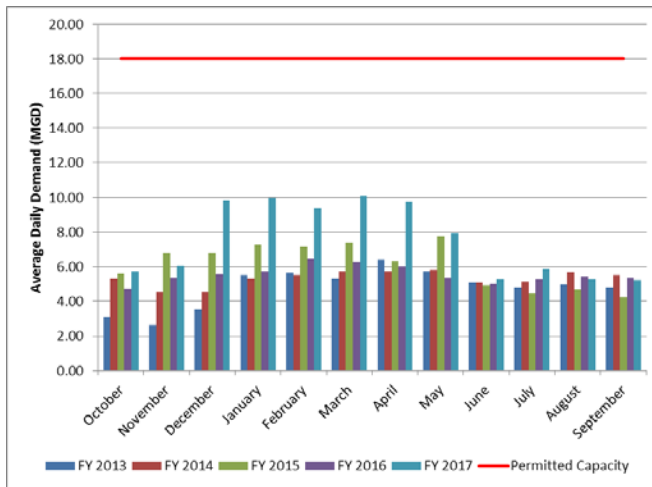
gallons of blended product water and 25 gallons of concentrate. The overall efficiency of Plant #1 is such that 78.5 gallons of potable water is produced from each 100 gallons of water removed from the wells. In the case of Plant #2, approximately 100 gallons of raw water produces 80 gallons of product water which is blended with 25 gallons of raw water to produce 105 gallons of blended product water. Overall, approximately 84 gallons of potable water is produced from each 100 gallons of raw water. The blending step adds beneficial minerals back into the water, which not only helps the next stage of the process, but also aids to improve the taste of the product. Concentrated water is disposed of, in accordance with FDEP regulations, and the blended water is conveyed to the next step of treatment.

Blended product water is post-treated for the removal of gases such as hydrogen sulfide and carbon dioxide using stripping towers. The blended water then enters a clearwell (41,000 gallons at Plant #1 and 117,500 gallons at Plant #2) where sodium hydroxide (caustic soda) is then added to attain desired pH. The product is then disinfected using sodium hypochlorite (bleach) and pumped via three transfer pumps at each plant to three 5-MG ground storage tanks. The chlorine levels are closely monitored to ensure successful disinfection and final samples are taken daily. Water is pumped from the ground storage tanks into the City's potable water distribution system using the High Service Pump Station. Pressure and flow are monitored and maintained by on-site equipment and with operator input.

Disposal of concentrate water is typically completed using one on-site deep injection well. However, should maintenance issues require the deep injection well to be taken out of service, concentrate water can be discharged to Lake Finisterre. In the event concentrate must be discharged to Lake Finisterre, additional water treatment is required. Use of the surface water discharge to Lake Finisterre has not been utilized since 2011. The deep injection well is permitted as a dual purpose well to serve not only the SW RO WTP but also the adjacent SW WRF. A second deep injection well has been constructed to serve these facilities and it has passed a mechanical integrity test. The above grade piping improvements for the deep injection well were near completion at the end of FY 2017.

Power to the South RO Plant is provided by Lee County Electric Cooperative (LCEC). In addition, there are two 2,250 KW diesel generators located at the Plant, each having sufficient capacity to power 100% of the process equipment at its current constructed capacity. There are also portable diesel generators that provide standby power at the production well sites.

This Plant therefore meets FDEP and FAC requirements for auxiliary power Chapter 62-555. The SW RO WTP water production flow data for FYs 2013-2017 is presented in the **Table 3-2** and **Figure 3-5**.

**Figure 3-5. Southwest RO WTP Average Daily Demand 2013-2017****Table 3-2 Southwest RO WRF Flow Data FY 2013 – FY 2017**

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2013</b>			
Oct-12	3.12	5.59	1.93
Nov-12	2.62	3.28	1.98
Dec-12	3.54	6.69	2.00
Jan-13	5.51	6.33	4.40
Feb-13	5.65	6.68	4.13
Mar-13	5.31	8.65	1.19
Apr-13	6.39	9.79	4.43
May-13	5.73	7.90	4.81
Jun-13	5.11	7.69	4.34
Jul-13	4.79	5.45	4.40
Aug-13	4.96	6.07	4.08
Sep-13	4.79	5.89	3.61
<b>FY 2014</b>			
Oct-13	5.33	5.82	4.54
Nov-13	4.54	6.37	2.90
Dec-13	4.53	6.50	2.19
Jan-14	5.30	6.45	4.39
Feb-14	5.51	6.53	4.69
Mar-14	5.75	7.11	4.54
Apr-14	5.74	6.53	4.92
May-14	5.82	6.88	4.95
Jun-14	5.08	5.71	4.36
Jul-14	5.15	5.71	4.47
Aug-14	5.69	6.55	4.87
Sep-14	5.52	6.92	3.89
<b>FY 2015</b>			
Oct-14	5.62	7.97	3.26
Nov-14	6.80	7.66	6.16
Dec-14	6.78	7.67	6.02
Jan-15	7.27	8.44	6.44
Feb-15	7.17	8.57	6.43
Mar-15	7.37	8.63	6.56
Apr-15	6.31	7.71	4.61

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2015</b>			
May-15	7.76	11.74	5.08
Jun-15	4.94	5.58	4.10
Jul-15	4.44	5.90	3.61
Aug-15	4.68	6.33	3.73
Sep-15	4.26	5.98	3.47
<b>FY 2016</b>			
Oct-15	4.70	5.87	3.97
Nov-15	5.37	6.66	4.49
Dec-15	5.54	8.46	4.30
Jan-16	5.73	6.75	4.78
Feb-16	6.46	9.07	4.94
Mar-16	6.27	6.95	4.05
Apr-16	6.03	7.15	4.42
May-16	5.33	6.57	4.63
Jun-16	5.01	6.10	4.15
Jul-16	5.25	6.14	4.53
Aug-16	5.44	6.79	3.76
Sep-16	5.33	6.51	3.76
<b>FY 2017</b>			
Oct-16	5.72	6.79	4.64
Nov-16	6.09	6.91	5.46
Dec-16	9.84	11.48	8.60
Jan-17	9.98	11.61	8.57
Feb-17	9.37	11.00	7.51
Mar-17	10.09	11.89	5.40
Apr-17	9.75	12.07	5.91
May-17	7.92	10.52	4.71
Jun-17	5.27	6.74	3.08
Jul-17	5.86	8.76	4.49
Aug-17	5.25	7.05	4.14
Sep-17	5.24	7.09	0.00

As shown in **Table 3-2** and **Figure 3-5**, there was an increase in production from FY 2013 to FY 2017, between the months October - April and there was a decrease in production between months May - September, reflecting seasonal population patterns. Production rates will vary month to month between the Southwest RO Plant and the North RO Plant depending on planned major maintenance, equipment failures, or variation in demand. However, the overall production is consistent.

The Southwest RO WTP production is currently well beneath the plants permitted capacity of 18.1 MGD and will meet future demands associated with the Utility Expansion Program. As noted, previously, the City's potable water treatment and distribution system can meet the demands of expansion areas denoted as SW 6 and 7, which are complete. In addition, an engineering study completed in February 2016, entitled "City of Cape Coral Water, Wastewater, and Irrigation Facilities Update", evaluated that the two

existing water production facilities have a combined capacity of 30.1 MGD, which is more than adequate to treat the additional potable water demands (approximately 3.8 MGD) from the North 1 and North 2 UEP areas at buildout conditions.

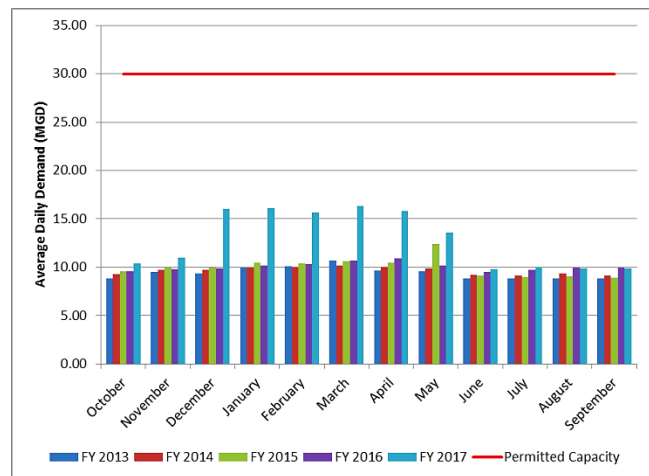
### 3.6 POTABLE WATER PRODUCTION AND FINISHED WATER QUALITY

During FY 2017, the City's water treatment plants had a combined monthly average daily flow (ADF) that ranged from a low of 9.78 MGD in June 2017 to a high of 16.33 MGD in March 2017 based on plant flow data provided by the City as shown in **Table 3-3**. The graphic shown in **Figure 3-6**, provides a comparison of the average daily flows (ADF) for the last five fiscal years (FY 2013 – FY 2017) and the combined permitted capacity for the system. As indicated, the permitted capacity substantially exceeds current demand.

**Table 3-3 FY 2017 Water Demand Data**

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2017</b>			
Oct-16	10.43	11.91	8.83
Nov-16	10.97	12.27	9.89
Dec-16	16.00	18.66	13.63
Jan-17	16.14	18.61	14.08
Feb-17	15.64	17.85	12.68
Mar-17	16.33	19.15	10.55
Apr-17	15.80	19.24	9.20
May-17	13.57	17.21	9.37
Jun-17	9.78	11.80	6.86
Jul-17	10.00	14.20	5.62
Aug-17	9.86	14.85	6.88
Sep-17	9.91	13.75	3.09

**Figure 3-6. Combined Potable Water Average Daily Demand FY 2013 – FY 2017**



Historically, the RO water treatment plants have consistently met or exceeded the Florida Department of Environmental Protection (FDEP) minimum standards for finished water quality. The finished water characteristics are reported daily on the monthly operating reports (MORs) and include effluent turbidity, total dissolved solids, free residual chlorine, pH, and the number of gallons treated. The bacteriological test results of the raw water are also reported on the MORs. In addition to the bacteriological test results and finished water characteristics, the finished water produced by each RO water treatment plant meets the other FDEP regulated primary and secondary drinking water quality standards. The City published its 2017 Consumer Confidence Water Quality Report and posted the report online on the City's website. The City of Cape Coral also won the FSAWWA Best Drinking Water Contest in 2017.

**Table 3-4** provides an analysis of raw water used, finished water provided, and water billed for fiscal years 2013 through 2017. In FY 2017 the RO plants produced approximately 4.69 billion gallons of finished water and the City of Cape Coral billed for about 3.43 billion gallons of water according to City records. Approximately 979 million gallons of potable water was unbilled as a result of line flushing, breaks, and leaks throughout the year. Nearly 233 million gallons of water was unaccounted for in FY 2017. The estimated percent of unaccounted for water, which is the total unaccounted for water divided by the total finished water pumped to the system in FY 2017, is 5.00%, which continues the downward tendency of unaccounted for water in the system for the last five years. Industry norms suggest that unaccounted for water of less than 10-percent is acceptable.

**Table 3-4 Total Raw Water, Water Produced and Water Billed FY 2013 – FY 2017**

	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Raw Water Pumped to Plants (1,000 gallons)					
North	2,218,224	2,073,168	1,865,404	2,211,454	2,598,434
Southwest	2,109,241	2,358,859	2,756,194	2,586,790	3,421,769
Combined	4,327,465	4,432,027	4,621,598	4,798,244	6,020,203
Finished Water Pumped to System (1,000 gallons)					
North	1,687,612	1,570,651	1,411,472	1,652,909	1,946,421
Southwest	1,747,104	1,944,933	2,232,228	2,026,238	2,747,454
Combined	3,434,716	3,515,584	3,643,700	3,679,147	4,693,875
Overall Percent Recovery (including blending)					
North	76.10%	75.80%	75.70%	74.70%	74.90%
Southwest	82.80%	82.50%	81.00%	78.30%	80.30%
Combined	79.40%	79.30%	78.80%	76.70%	78.00%
Metered Water for Billing (1,000 gallons)	2,868,722	2,922,847	2,984,230	3,162,781	3,426,638
Adjusted Metered Water for Billing (1,000 gallons)	2,914,621	2,969,612	3,031,978	3,213,386	3,481,465
Flushed/Leaked (1,000 gallons)	176,557	185,719	243,511	229,428	979,612
Accounted for Water (1,000 gallons)	3,091,178	3,155,236	3,275,322	3,442,814	4,461,077
Unaccounted for Water (1,000 gallons)	343,538	360,347	368,378	236,334	232,798
Percent Unaccounted for Water (1,000 gallons)	10.00%	10.20%	10.10%	6.40%	5.00%

Unaccounted for water = 1-(Adjusted metered water for billing + Flushed/Leaked)/Finished water pumped to system)

The City strives to reduce unaccounted for water. It is recommended that the City continue to pursue efforts to reduce unaccounted for water, which is an emphasis of the Florida Water Management Districts, which regulate water use permits. The City has taken several actions to reduce this percentage including regular monitoring/testing of piping, the tracking of water mains and service line leaks, monthly reporting of water consumption, the purchase of leak detection equipment, and accurate accounting of water used in flushing lines, which is necessary for maintenance of water quality in the distribution system.

The City conducted a review in which the City's Water Data and unaccounted losses were evaluated. The review resulted from conditions within the City's Water Use Permit (WUP) that required an external review in the event unaccounted losses of water are greater than 10%. Although the review concluded that the City's unaccounted-for loss of potable water is less than 10%, and the City is not required to implement a leak detection program, the UCD Division does have an ongoing leak detection and repair program.

### 3.7 SUMMARY OF MAJOR EQUIPMENT AT RO FACILITIES

A listing of major equipment located at both the North and SW RO WTPs is included in **Table 3-5**. In general, the major process equipment and general operating conditions of the facilities are in good working order. Most structures are new or have undergone recent upgrades or rehabilitation.

### 3.8 RO Plant Staffing and Training

The North RO WTP is currently staffed with a chief operator, nine certified water treatment plant operators and seven maintenance staff. The South RO WTP is staffed with a chief operator, nine certified water treatment plant operators and seven maintenance staff. Plants are staffed and water is pumped from the finished water ground storage tanks to the distribution system 24 hours per day, seven days per week. However, due to the current operator staffing levels, the reverse osmosis treatment production process used to produce finished potable water to fill the ground storage tanks normally occurs for only 16 hours per day. Increasing operator staffing levels over the next 3-4 years in the form of two additional certified operators or trainees per plant would allow the plants to produce finished water 24 hours per day and help provide the needed additional supplemental water for irrigation.

**Table 3-5**  
**CITY OF CAPE CORAL WATER PRODUCTION**  
**WATER TREATMENT PLANT**  
**MAJOR PROCESS EQUIPMENT**

	<u>SW PLANT 1</u>	<u>SW PLANT 2</u>	<u>NORTH</u>
A. Wells:			
1. Number of Production Wells	12	21	22
2. Number of Injection Wells	1 (Shared with P-2)	n/a	1
B. Cartridge Filters:			
1. Feed Water Filters:			
a. Number of Filter Housings	5	10	4
b. Number of Filters per Housing	80	52	140
c. Length of Filters (inches)	40	30	40
d. Filter Grade (nominal micron rating)	5	5	5
2. Blend Water Filters:			
a. Number of Filter Housings	n/a	n/a	1
b. Number of Filters per Housing	n/a	n/a	98
c. Length of Filters (inches)	n/a	n/a	40
d. Filter Grade (nominal micron rating)	n/a	n/a	5
C. High Pressure Pumps:			
1. Number of Pumps with Motors	10	8	4
2. Horsepower per Motor (hp)	150	150	400
3. Feed Flow per Train (gpm)	464	1,000	2,187
D. Reverse Osmosis Units:			
1. Number of Production Trains	10	8	4
2. Number of Pressure Vessels per Train	21	30	72
3. Pressure Vessel Array	10:7:4	20:10	48:24
4. Number of Elements per Vessel	4	7	7
5. Number of Stages	3	2	2
6. Total Elements (Train)	84	210	504
7. Total Number of Elements (Plant)	840	1,680	2,016
8. Membrane Element Size	8" x 40"	8.5" x 40"	8" x 40"
9. RO Membrane Type	High Rejection TFC	High Rejection TFC	High Rejection TFC
10. Feed Pressure to 1 <sup>st</sup> Stage (psi)	140	160	150
11. Recovery Rate (%)	75	85	80
12. RO Capacity (mgd)	5	10	10
13. Current Blend Rate (mgd)	1	2	2
14. Total Plant Capacity (mgd)	6	12	12
15. Raw Water Required (mgd)	7.7	13.7	14.5
16. Concentrate Produced (mgd)	1.7	1.7	2.5
E. Degassifiers:			
1. Number of Degassifiers	2	2	2
F. Clearwells:			
1. Number of Clearwells	1	1	1
2. Clearwell Volume (gallons)	41,000	117,500	170,000
G. Transfer Pumps:			
1. Number of Pumps with Motors	3	3	3
2. Horsepower per Motor (hp)	100	150	100
3. Capacity per Pump (gpm)	2,385	4,276	4,167
4. Total Pumping Capacity (gpm)	7,155	12,828	12,501

**Table 3-5(continued)**  
**CITY OF CAPE CORAL WATER PRODUCTION**  
**WATER TREATMENT PLANT**  
**MAJOR PROCESS EQUIPMENT**

	<u>SW PLANT 1</u>	<u>SW PLANT 2</u>	<u>NORTH</u>
H. High Service Pumps:			
1. Number of Pumps	4	3	4
2. Horsepower			
a. Units 1-2 (hp)	125	200	300
b. Unit 3 (hp)	200	200	600
c. Unit 4 (hp)	200	n/a	600
3. Pumping Capacity			
a. Unit 1 (gpm)	2,000	2,500	3,750
b. Unit 2 (gpm)	2,000	2,500	3,750
c. Unit 3 (gpm)	3,500	2,500	7,500
d. Unit 4 (gpm)	3,500	n/a	7,500
4. Total Capacity	10,500	7,500	22,500
I. Chemical Feed Systems:			
1. Sulfuric Acid			
a. Bulk Capacity per Tank (gallons)	15,000	20,000	31,000
b. Number of Bulk Tanks	1	1	1
c. Day Capacity per Tank (gallons)	250	360	475
d. Number of Day Tanks	2	1	2
2. Sodium Hydroxide			
a. Bulk Capacity per Tank (gallons)	6,000	12,770	16,500
b. Number of Bulk Tanks	1	1	1
c. Day Capacity per Tank (gallons)	45	150	475
d. Number of Day Tanks	1	1	2
3. Scale Inhibitor			
a. Bulk Capacity per Tank (gallons)	2,000	3,500	5,000
b. Number of Bulk Tanks	1	1	1
c. Day Capacity per Tank (gallons)	150	60	120
d. Number of Day Tanks	1	1	1
4. Liquid Sodium Hypochlorite Tanks			
a. Bulk Capacity per Tank (gallons)	4,000	(Shared with Plant 1)	10,000
b. Number of Bulk Tanks	3	(Shared with Plant 1)	2
c. Day Capacity Tank (gallons)	160	160	1,000
d. Number of Day Tanks	1	1	1
e. Shared 1 Conc. Day Tank (gallons)	60	(Shared with Plant 1)	n/a
J. Auxiliary Power:			
1. Plant Generators			
a. Power Output per Generator (kw)	2,250	2,250	2,250
b. Number of Generators	1	1	2
2. Plant Diesel Tanks			
a. Bulk Tank Capacity	15,000	15,000	12,000
b. Number of Bulk Tanks	1	1	2
c. Day Tank Capacity (gallons)	400	400	400
d. Number of Day Tanks	1	1	2
3. Portable Well Generators			
a. Power Output per Generator (kw)	65	n/a	65
b. Number of Generators	4	n/a	10
c. Day Tank Fuel Capacity (gallons)	100	n/a	100

The Water Production Division has a safety committee, which holds monthly staff safety meetings. OSHA requirements are reviewed and appropriate training sessions regarding specific safety topics are conducted. All staff members are trained on standard operating procedures and safety equipment, and receive bi-weekly safety handouts for review. Annual staff safety training takes place and includes lockout, hazardous waste spill or contact, confined space, safe driving and other topics applicable to the RO plant work environment.

### **3.9 SUMMARY OF MAINTENANCE AND MAJOR ACCOMPLISHMENTS AT RO PLANTS DURING FY 2017**

The North and SW RO Plants' maintenance staff consists of licensed electricians and mechanics. Maintenance schedules have been established outlining the equipment and portions of the facility that are to be maintained on a weekly, monthly, quarterly or annual basis.

It is the responsibility of the operators on duty to perform daily equipment checks to identify equipment that requires additional attention. When equipment requires repair or troubleshooting, a work order is generated for the Maintenance Department to execute work. Work orders are generated by the Plant operators to ensure proper repairs are completed. The work orders, along with routine maintenance, allow the Plants to operate consistently and produce water continuously.

The primary treatment processes at the North and SW RO facilities are largely dependent on the condition of the RO membranes. In order to improve the Plants' ability to produce potable water, the operators perform annual cleaning of the RO membranes. The annual cleaning has not only prolonged the life of the membranes often exceeding the life expectancy set by the manufacturer, but also provided substantial cost savings.

In addition to preventative maintenance, the City's Potable Water Division implements system improvements to maintain the quality of the service provided to the public. FY 2017 major accomplishments include:

- Continued reduction in electrical usage from Southwest Reverse Osmosis (RO) membranes. Replaced membranes with a new lower

pressure membrane in an innovative configuration: Estimated \$126,895 recurring annual cost avoidance.

- Achieved compliance w/LCEC load management agreement for peak load shaving at both RO Plants. Estimated \$225,000 annual recurring electric cost savings.
- Completed engineering design and permitting for the Phase I Palm Tree Pump Station improvements.
- Completed the Auxiliary Power and Control project at the Van Loon re-pump station.
- Completed the Southwest RO warehouse project.
- Completed Phase 1 of the Southwest RO Plant Well Communication/Control retrofit project.
- Completed Grounding Study for the Southwest RO Plant wells and began implementing grounding improvements.
- Completed Switchgear/Breaker Maintenance for the North RO Plant.
- Completed the Southwest RO Plant 1 structural improvements.
- Selected an engineering firm and began design specifications for Southwest RO Odor Control Improvements.
- Selected a vendor and began work on replacement of the damaged primary buss duct that feeds power to the North RO Plant Operations and Production Building.
- Completed construction on the SWRO/SWWRF Deep Injection Well #2 as scheduled and required by the FDEP Consent Order. Selected a vendor and began work on above ground piping and appurtenances.
- Selected a vendor for Geological services to update the Hydrogeologic ground water model and finalized contract with council approval.
- Completed the Switchgear/Breaker Shutdown & Maintenance procedures for the North RO Plant.
- Replaced both existing 10,000 gallon Bleach Bulk Storage tanks at the North RO plant with new bulk tanks.
- Performed successful cleaning of the Reverse Osmosis membrane elements in both plants resulting in reduced operating pressures.
- Changed out degasifier packing media at the Southwest RO Plant.
- Renewed Deep Injection Well (DIW) permits for both RO Plants.

- Completed on-line cleaning for all six Ground Storage Water Tanks (GST's).

Over the course of FY 2017 the Water Production Division was recognized by various agencies for compliance with IT security measures, exemplary safety training, best tasting drinking water, and overall best large water system and membrane plant as noted below:

- Completed the IT assessment of the Industrial Control System (ICS) for the North RO Plant that showed the system was overall 94% compliant with Homeland Security established benchmarking measures.
- Cape Coral's Drinking Water won the AWWA's Best Tasting Drinking Water Award in 2017.
- The North RO Plant received the Florida Water & Pollution Control Operator's Association's Safety Award for exemplary safety training, policies, and practices.
- The Florida Department of Environmental Protection awarded their annual Plant Excellence Award to the North RO Plant as Best Large Community Water System in the South District. The South District includes all large plants from Sarasota to Key West.
- The Southeast Desalting Association presented the Outstanding Membrane Plant of the year award to the North RO Plant for being recognized as the Best Large Membrane Treatment System in the Southeast United States.

A significant accomplishment achieved by the Water Production Division was the ability to maintain a pressurized water system during Hurricane Irma by shutting down the Southwest RO Plant and keeping the North RO Plant operational. The City of Cape Coral was one of a very few potable water facilities that were able to provide continuous service to its customers during and after Hurricane Irma without having to issue a system-wide boil water notice.

### 3.10 WATER STORAGE AND PUMPING FACILITIES

The Van Loon Storage and Booster Pump Station is used as a storage and repump station and the total rated capacity of the pumps are 2.9 MGD. There is also a 1.0 MG concrete ground storage tank on site. The firm pumping capacity of the Van Loon Storage and Booster Pump Station is 1.4 MGD. Additionally,

the station has a portable generator hookup for one High Service pump in case of an emergency.

**Table 3-6** shows the major process equipment of both the Palm Tree Pumping Station and the Van Loon Storage and Booster Pump Station. Planned upgrades to the facilities include a pipeline extension as well as construction of a separate suction and two discharge lines at the Palm Tree storage tank to improve water age.

### 3.11 POTABLE WATER MAINS

The UCD Division is currently maintaining approximately 907 miles of potable water mains, 4,362 potable fire hydrants and 63,014 potable water meters. The potable water mains distribute finished water from the RO WTPs to the customers of Cape Coral. The potable mains, including service laterals, are also inspected for leaks and other potential problems. Other work under these programs includes the removal and replacement of galvanized steel potable water mains and service lines throughout the City.

Several years ago, the City initiated a program for water meter change-outs and retrofits to a radio-electronic system with objectives to reduce the number of reading routes and to replace older meters. The UCD Division has an ongoing maintenance program that includes general routine maintenance; fire hydrant maintenance that includes flushing, repairing and painting; a leak detection program for potable water service laterals; and a meter change out program.

In order to prevent backflow and cross connection for the potable water, the UCD Division installs, checks and maintains single family and duplex residential backflow devices.

The City's potable water distribution system is in good operating condition. It is recommended that the City continue with the galvanized pipe replacement program. The City should continue with the leak detection and meter change out programs as these programs improve customer service while also maintaining a system that meets regulatory requirements. The gradual replacement of older systems provides better customer service while also providing improved utility efficiency especially as these pipes continue to age.

**Table 3-6 Storage and Repump Station Major Process Equipment**

Parameter / Unit Operation or Process	Palm Tree Pumping Station	Van Loon Storage & Repump Station
<b>Finished Water Storage (Concrete Ground Storage Tank)</b>		
Number of Tanks	1	1
Capacity of Tanks	2 MG	1 MG
<b>High Service Pumps</b>		
Number of Pumps	4	2
Capacity of Pumps (each)	1,500 GPM	1,000 GPM
Total capacity	6,000 GPM	2,000 GPM



## Chapter 4 Water Reclamation System

### 4.1 GENERAL OVERVIEW OF WASTEWATER SYSTEM

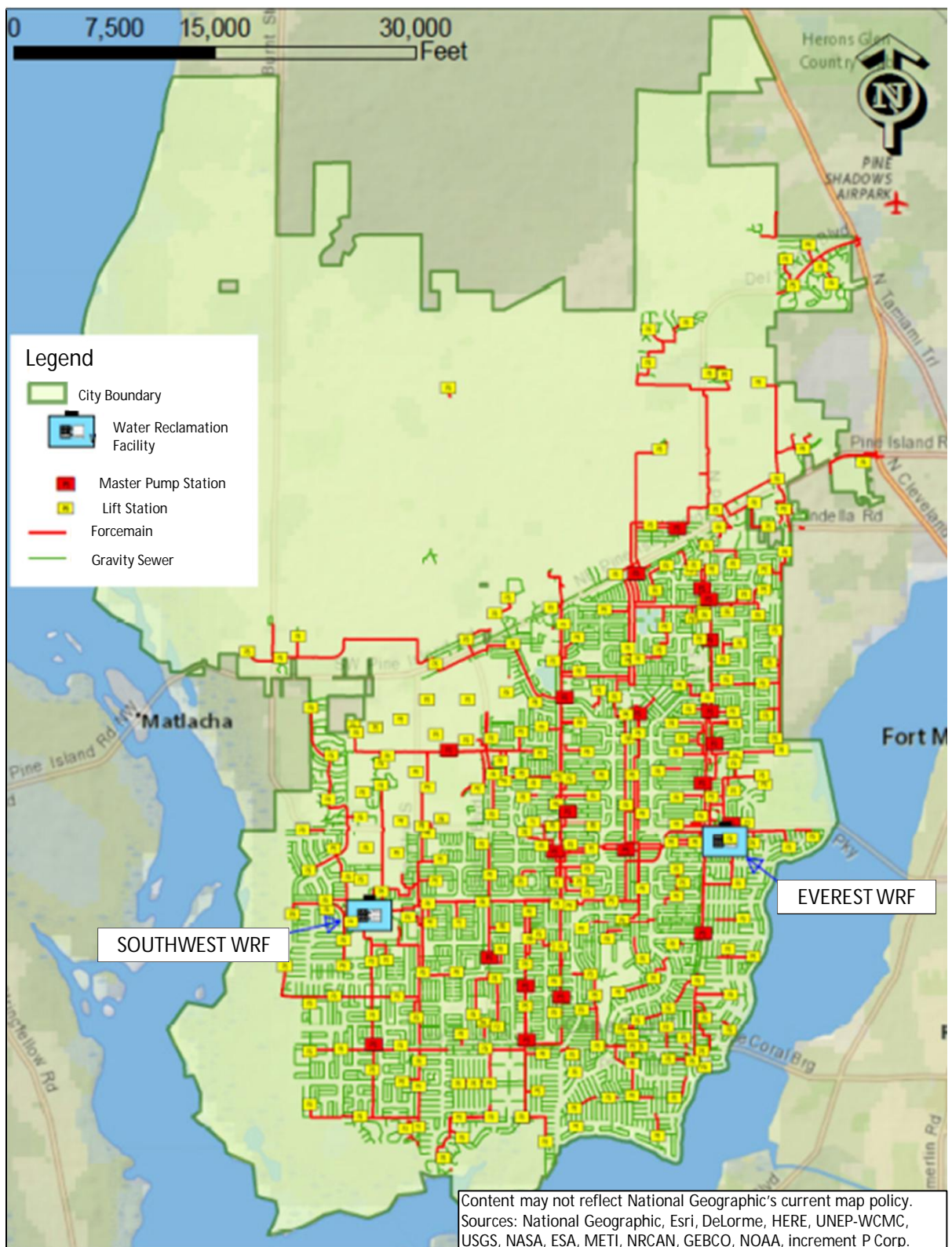
The City of Cape Coral's water reclamation system consists of gravity sewer mains, wastewater lift stations, force mains, two water reclamation facilities, and an extensive reuse irrigation system. The treatment facilities include the Everest and Southwest WRFs. Each plant operates under its own permit and both permits are current. The Everest WRF is permitted for 13.4 MGD and the permit will expire in November 2022. The Southwest WRF permitted capacity is 15.0 MGD and will expire in October 2021. Reuse water from both the Everest WRF and Southwest WRF is distributed to the city of Cape Coral's citizens via a reuse irrigation system. A map of the wastewater collection and conveyance system is presented in **Figure 4-1**.



### 4.2 GRAVITY SEWERS

The City's gravity sewer system collects and conveys wastewater flow from residences, businesses, institutions, and other facilities to the wastewater lift stations. The UCD Division is currently maintaining approximately 734 miles of gravity sewer and 11,659 sewer manholes located throughout the City's utility service area. The majority of the existing sewer mains

are PVC, which typically have less joints and are less likely to crack than clay. However, there are 162 miles of clay gravity sewer mains which were constructed as a part of the original City infrastructure. The gravity sewer mains being constructed within the UEP service areas are constructed with PVC pipe and are in generally good condition.

Inflow and infiltration into the gravity sewer system is more prevalent in the older sections of the City where clay piping is used. During heavy rain events, flow to the Water Reclamation Facilities will quickly increase and then decrease after the rainfall has ended. The UCD Division has observed that infiltration is entering the gravity system through the manhole chimneys during heavy rain events, especially when these manholes are located in low lying areas and drainage swales. The UCD Division has ongoing programs to prevent extraneous flows from entering into the wastewater conveyance system. Gravity sewer mains are televised, manholes are inspected, and sewer mains and manholes are sealed /rehabilitated as required. There is also a program to address critical manhole chimneys to eliminate infiltration by placing cut concrete pipe and joint sealant between the manhole frames/covers and the manhole sections. In addition, manhole cover inserts are used in select locations to eliminate inflow in the manhole and PVC



Source: City of Cape Coral User: karagozk Date: July 2018		Cape Coral Annual Report FY 2017  Wastewater System Map	  4415 Metro Parkway Suite 404 Fort Myers, Florida 33916 T 239-278-7996 F 239-278-0913	Figure  4-1
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liners are used in deeper manholes to address manhole deterioration caused from hydrogen sulfide and to reduce infiltration.

It is the opinion of AECOM that the gravity sewer system is in generally good physical condition and that the City should continue with their programs which address inflow and infiltration and general rehabilitation needs of the gravity system located in the older areas of the City.

#### **4.3 WASTEWATER LIFT STATIONS**

The City of Cape Coral owns and operates a total of 300 wastewater lift stations, of which 22 are master lift stations. There are a total of 610 pumps in these lift stations. The master stations have three or more pumps that operate in an alternating lead, lag, and lag-lag mode; the duplex stations have two pumps that operate in an alternating lead-lag mode.

All of the master lift stations are equipped with back-up power generators. Twenty-five lift stations (25) have odor control systems. In addition to the fixed master station standby power generators, the City also has 26 portable trailer mounted generators.

The City of Cape Coral has an ongoing pro-active program of rehabilitating lift stations. Rehabilitation of lift stations typically include concrete/leak repair, the coating of the wet well and replacing the discharge piping between the pumps and check valves with high-density polyethylene (HDPE). This process also includes the replacement of the pump discharge bases, check valves, and plug valves. The rehabilitation of aging lift stations is a beneficial program to the City and is recommended to continue in the future. The Rehabilitation Program reduces infiltration, which ensures that the lift stations will function properly and transport wastewater in an

environmentally safe manner, and is less costly than replacement of a lift station. The five-year CIP for lift station rehabilitation plans to rehabilitate an average of five lift stations per year.

Under the City's maintenance program, maintenance personnel check the collection system lift stations weekly. Additional monitoring on most of the duplex stations is performed through the City's Supervisory Control and Data Acquisition (SCADA) System on a continual basis. Use of the SCADA system provides critical information that supplements the necessary on-site inspections.

Planned improvements include the addition of 13 portable pumps or generators to ensure system reliability during emergencies. The construction of 13 additional lift stations and 2 master pump stations is planned as part of the North 2 UEP.

The Wastewater Lift Stations are in generally good operating condition and the City should continue the Lift Station Rehabilitation Program and increase the number of rehabilitations per year as the quantity of lift stations increase.

#### **4.4 FORCE MAINS**

The City's force main system conveys wastewater, under pressure, from the wastewater lift stations to the City's water reclamation facilities. The UCD Division currently maintains approximately 203 miles of force main. The City has an ongoing program to check sections of the force mains for leaks and other potential problems.

The system is in good operating condition and it is recommended that the City continue with the program of checking for leaks and other potential problems.

#### 4.5 EVEREST WATER RECLAMATION FACILITY

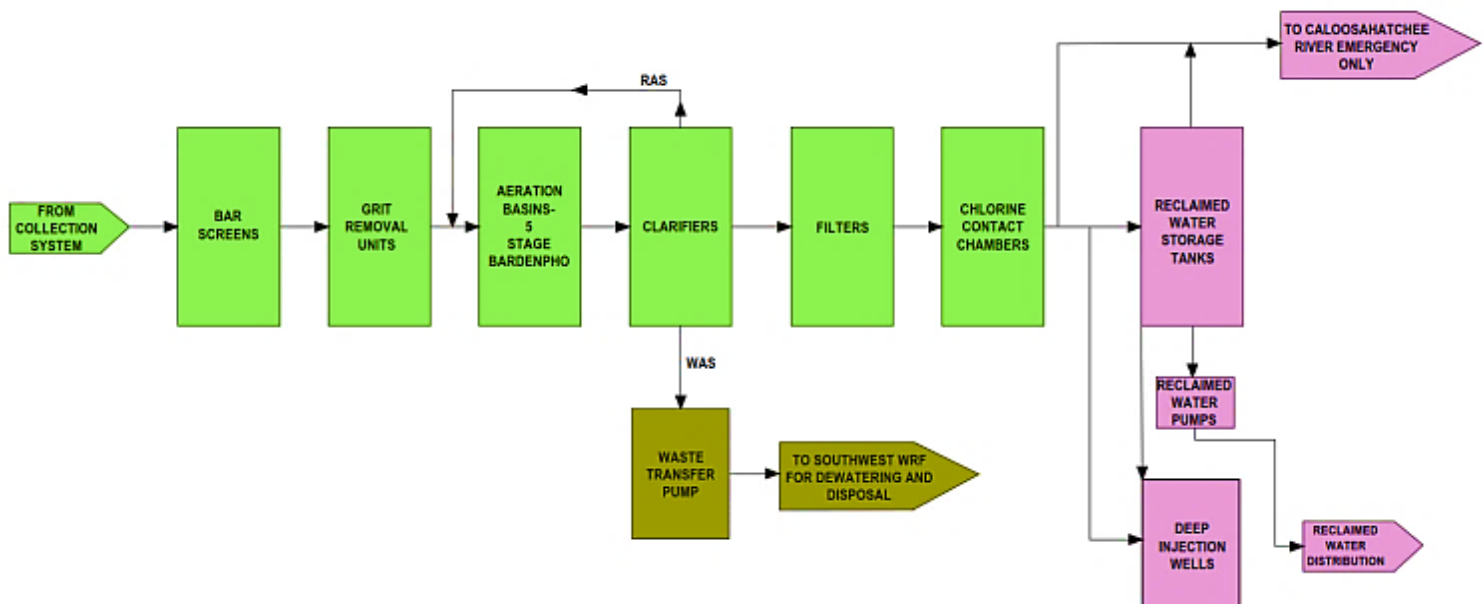
The Everest Water Reclamation Facility was constructed as a 2.3 MGD treatment plant in 1975. After several expansions, the facility was upgraded to the current capacity of 13.4 MGD. The facility is currently at buildout capacity. The Everest Water Reclamation Facility consists of three treatment processes; pretreatment, secondary treatment, and tertiary treatment. After the treatment is complete, the effluent flow is transferred to reuse storage tanks, deep-well injected, or discharged to surface water bodies (**Figure 4-2**). Although the City has retained the NPDES permit allowing for the treated effluent to be disposed of to a surface water body, nearly 100% of the water is used to supply the City's irrigation network. The solids that are produced from biological treatment are stored in holding tanks and eventually pumped to the Southwest Facility for treatment and disposal.

Pretreatment consists of mechanical equipment that removes grit and debris from the influent water before entering the biological treatment process. The influent water is screened by two mechanical bar screens, a third manual bar screen acts as a back-up. After screening, two vortex-type units and two cyclone/classifier units are used to remove grit from the screened water. After the screening and grit removal process is complete, the water is gravity fed into the biological treatment process.

The secondary treatment process is comprised of a five-stage Bardenpho nitrification-denitrification biological treatment process. The influent water is passed through four biological treatment tanks that provide an anaerobic zone, an anoxic zone, and lastly an aerobic zone. The different biological zones promote the efficient removal of nutrients and the degradation of organic waste. A percentage of the treated water or mixed liquor from the biological process is recycled from the aerobic to the anoxic zone using high volume pumps. This ensures that the level of nutrient and organics removal is maintained at a sufficient level.

The effluent water from secondary treatment flows by gravity into four secondary clarifiers for settling. After settling of the solids is complete, they are pumped from the bottom of the clarifier to waste holding tanks and eventually pumped by force main to the Southwest Facility for processing and disposal. The clarified water is fed through traveling bridge filters and treated in a chlorine contact chamber to provide high level disinfection using sodium hypochlorite. Transfer pumps are used to pump the reclaimed water into two 5 MG holding tanks. From the holding tanks the reclaimed water is then distributed into the irrigation network. In the event that the reclaimed water does not meet irrigation quality standards, the reject water is injected into deep wells. Surface water discharge is available in case of an oversupply of water. However, a surface water discharge has not been utilized since 2008.

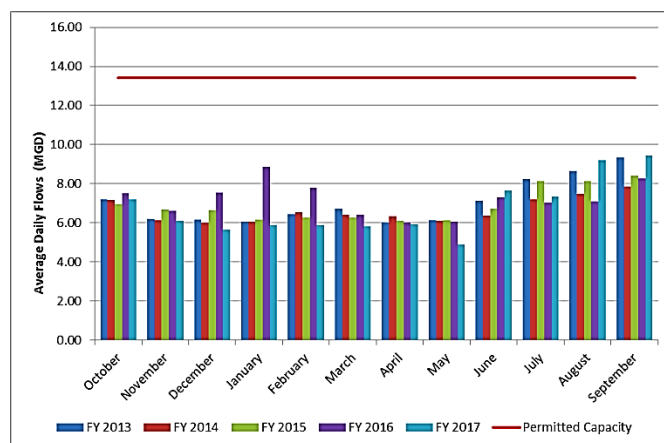
**Figure 4-2 Everest WRF Influent Flow FY2013 - FY2017**



Power to the plant is provided by Lee County Electric Cooperative (LCEC), and three 2000-kW diesel generators provide standby power with capacity to operate 100% of the process equipment at its current constructed capacity.

**Figure 4-3** provides a comparison between the Average, Minimum and Maximum daily flow for the Everest WRF for the last 5 years (2013-2017). **Table 4-1** presents influent flow data for the same time period.

**Figure 4-3 Everest WRF Influent Flow FY2013-FY2017**



**Table 4-1 Everest WRF Influent Flow Data 2013-2017**

Month	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Minimum Daily Flow (MGD)
FY 2013			
Oct-12	7.19	10.07	6.15
Nov-12	6.19	6.73	5.78
Dec-12	6.15	6.83	5.70
Jan-13	6.05	6.49	5.19
Feb-13	6.44	9.93	5.83
Mar-13	6.72	7.51	5.71
Apr-13	6.03	6.61	5.60
May-13	6.13	7.71	5.24
Jun-13	7.13	9.64	5.50
Jul-13	8.24	14.34	6.51
Aug-13	8.66	14.25	6.84
Sep-13	9.33	15.26	7.43
FY 2014			
Oct-13	7.16	9.37	5.85
Nov-13	6.13	7.27	5.45
Dec-13	6.00	6.49	4.65
Jan-14	6.07	6.86	5.33
Feb-14	6.55	7.41	5.86
Mar-14	6.42	7.76	5.85
Apr-14	6.33	7.21	5.65

Month	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Minimum Daily Flow (MGD)
FY 2014			
May-14	6.08	7.03	5.21
Jun-14	6.38	9.21	4.89
Jul-14	7.19	8.49	5.80
Aug-14	7.49	9.37	6.38
Sep-14	7.87	9.84	6.45
FY 2015			
Oct-14	6.95	9.17	6.09
Nov-14	6.68	11.57	5.70
Dec-14	6.63	7.57	6.12
Jan-15	6.15	6.59	5.59
Feb-15	6.27	6.89	5.64
Mar-15	6.26	6.96	5.48
Apr-15	6.11	7.00	5.39
May-15	6.12	6.81	5.24
Jun-15	6.73	7.94	5.55
Jul-15	8.12	12.06	6.29
Aug-15	8.12	9.94	7.01
Sep-15	8.41	10.99	7.01
FY 2016			
Oct-15	7.50	10.27	6.25
Nov-15	6.62	9.10	5.92
Dec-15	7.56	10.62	6.01
Jan-16	8.86	15.07	6.03
Feb-16	7.78	10.06	6.58
Mar-16	6.40	7.13	5.69
Apr-16	6.01	6.54	5.47
May-16	6.05	7.26	5.47
Jun-16	7.30	10.47	5.67
Jul-16	7.04	9.90	5.93
Aug-16	7.09	8.85	5.90
Sep-16	8.25	10.95	6.55
FY 2017			
Oct-16	7.20	10.80	5.75
Nov-16	6.10	7.00	4.70
Dec-16	5.65	6.05	4.96
Jan-17	5.89	6.75	5.45
Feb-17	5.89	9.00	3.55
Mar-17	5.82	6.60	5.20
Apr-17	5.94	7.00	5.10
May-17	4.88	6.00	3.75
Jun-17	7.64	11.00	4.25
Jul-17	7.35	8.95	6.40
Aug-17	9.19	21.30	6.20
Sep-17	9.43	13.25	7.56

Influent flow varied on a year to year basis but remained well below the Everest WRF permitted capacity of 13.4 MGD. In 2017, the average daily flow varied from 4.88 to 9.43 MGD. Maximum daily flow was 21.30 MGD, and minimum flow was 3.55 MGD.

#### 4.6 SOUTHWEST WATER RECLAMATION FACILITY

The Southwest Water Reclamation Facility began operation with a permitted capacity of 6.6 MGD in fiscal year 1994. In fiscal year 2010 the facility was

expanded to the current permitted capacity of 15 MGD. During the expansion in 2010, significant modifications were made to the facility. These modifications were made in a manner that allows for the plant to be expanded to a 20 MGD facility in the future. The effluent water from the Southwest Facility is conveyed into the City's irrigation distribution network or injected to a deep well. Eliminating the disposal of effluent to surface water bodies allows the facility to avoid permit requirements set forth by NPDES.

The Southwest Facility consists of three major treatment processes; primary, secondary, and tertiary, (**Figure 4-4**). The primary treatment process consists of mechanical equipment that is designed to remove grit and debris from the influent water before entering the biological treatment process. The influent water is screened by two mechanical bar screens with a manufacturer rated capacity of 23 MGD. A third, manual bar screen acts as a back-up and also has a capacity rating of 23 MGD. After screening, four vortex-type units and two cyclone/classifier units are used to remove grit from the water. Each vortex removal unit has a manufacturer's capacity rating of 15 MGD. After the screening and grit removal process is complete, the water is gravity fed into the biological treatment process.

The secondary treatment process is comprised of a four-stage nitrification-denitrification biological treatment process. The influent water is passed through different biological processes of the treatment train that include an anaerobic zone, an anoxic zone, and lastly an aerobic zone. The different biological zones promote the efficient removal of nutrients and the degradation of organic waste.

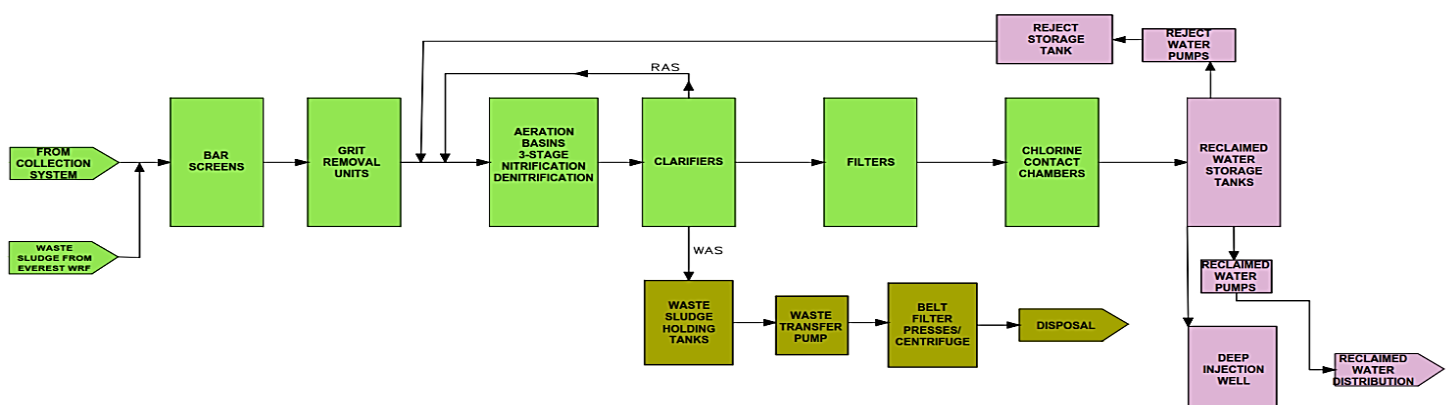
A percentage of the biologically treated wastewater or mixed liquor is recycled internally to maintain the health and functionality of the nutrient and organic removal process. The effluent water from secondary treatment flows by gravity into five secondary clarifiers for settling. After settling of the solids is complete, the solids are pumped from the bottom of the clarifier to waste holding tanks or a biological treatment process.

Tertiary treatment is the final stage in the process and improves the quality of water after biological treatment. The clarified water is fed through up-flow sand filters and treated in a chlorine contact chamber to provide high level disinfection using sodium hypochlorite. Transfer pumps are used to pump the reclaimed water into holding tanks. From the holding tanks the reclaimed water is then distributed into the irrigation system or deep-well injected by pumps that are dual purpose to complete either process.

Waste sludge from the Everest WRF is pumped via force main to the Southwest WRF and enters the facility with the raw influent wastewater. The biological solids resulting from the clarifying process are dewatered using centrifuges. The dewatered solids are converted into compost; used for fuel at the Waste to Energy Plant or transferred to the Lee County Solid Waste Landfill.

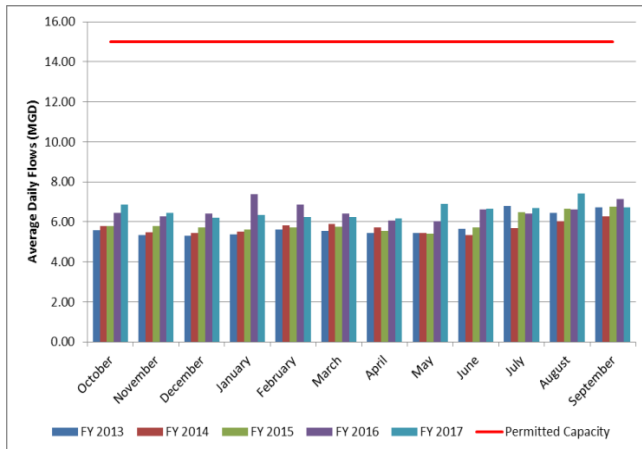
Power to the Southwest WRF is provided by Lee County Electric Cooperative (LCEC). Three 1500 kW generators and three 2250 kW provide standby power with capacity to operate 100% of the process equipment at the reuse/biosolids operation and the WRF respectively. The WRF meets FDEP and EPA requirements for auxiliary power.

**Figure 4-4 Southwest WRF Process Flow Diagram**



**Table 4-2** summarizes influent flow data collected over the last 5 years, and **Figure 4-5** shows a comparison of month to month flow over the period of FY 2013 – FY 2017.

**Figure 4-5 Southwest WRF Inflow FY 2013 - FY 2017**



**Table 4-2 Southwest WRF Historical Flow Data FY2013 - FY2017**

Month	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Minimum Daily Flow (MGD)
<b>FY 2013 Southwest WRF</b>			
Oct-12	5.59	6.45	5.07
Nov-12	5.35	6.93	4.94
Dec-12	5.31	6.07	4.85
Jan-13	5.37	5.75	4.93
Feb-13	5.62	6.12	5.02
Mar-13	5.56	6.04	5.17
Apr-13	5.43	6.62	4.90
May-13	5.45	6.96	4.93
Jun-13	5.64	6.48	4.75
Jul-13	6.80	8.99	5.57
Aug-13	6.43	7.58	5.67
Sep-13	6.73	9.67	5.87
<b>FY 2014 Southwest WRF</b>			
Oct-13	5.77	6.76	5.28
Nov-13	5.48	6.03	5.12
Dec-13	5.43	5.95	5.01
Jan-14	5.53	5.89	5.16
Feb-14	5.83	6.27	5.28
Mar-14	5.90	6.66	5.50
Apr-14	5.74	6.11	5.39
May-14	5.44	5.96	5.10
Jun-14	5.34	6.02	5.01
Jul-14	5.67	6.24	5.13
Aug-14	6.02	6.69	5.50
Sep-14	6.29	7.46	5.48

Month	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Minimum Daily Flow (MGD)
<b>FY 2015 Southwest WRF</b>			
Oct-14	5.80	6.75	5.38
Nov-14	5.78	8.27	5.33
Dec-14	5.72	6.11	5.22
Jan-15	5.63	5.99	5.23
Feb-15	5.72	6.31	5.37
Mar-15	5.77	6.19	5.40
Apr-15	5.56	6.08	5.23
May-15	5.40	6.17	4.64
Jun-15	5.73	6.18	5.33
Jul-15	6.49	12.30	5.41
Aug-15	6.64	10.48	5.81
Sep-15	6.77	9.31	5.83
<b>FY 2016 Southwest WRF</b>			
Oct-15	6.46	7.25	5.82
Nov-15	6.26	8.10	5.77
Dec-15	6.42	8.50	4.59
Jan-16	7.38	10.74	5.61
Feb-16	6.86	7.63	6.36
Mar-16	6.41	7.00	6.08
Apr-16	6.08	6.61	5.74
May-16	6.02	6.52	5.50
Jun-16	6.61	8.62	5.81
Jul-16	6.43	6.99	5.88
Aug-16	6.63	7.34	5.73
Sep-16	7.14	8.05	5.73
<b>FY 2017 Southwest WRF</b>			
Oct-16	6.87	8.84	6.23
Nov-16	6.43	6.95	6.14
Dec-16	6.19	6.57	5.80
Jan-17	6.35	6.96	6.09
Feb-17	6.22	6.76	5.58
Mar-17	6.25	6.66	5.69
Apr-17	6.19	6.99	5.63
May-17	6.91	7.77	6.24
Jun-17	6.65	7.79	6.01
Jul-17	6.69	7.55	6.20
Aug-17	7.42	15.03	6.27
Sep-17	6.71	7.80	5.88

Overall, influent flow to the Southwest WRF has increased over the last 5 years. In FY 2017, average daily flows ranged from 6.19 to 7.42 MGD, maximum daily flow was 15.03 MGD and minimum daily flow was 5.58 MGD. The influent flow over the year is typically well below the permitted capacity of 15 MGD and will be able to treat additional flow generated from the Utility Expansion Program. The Southwest WRF can also handle the occasional peak flows over 15 MGD by

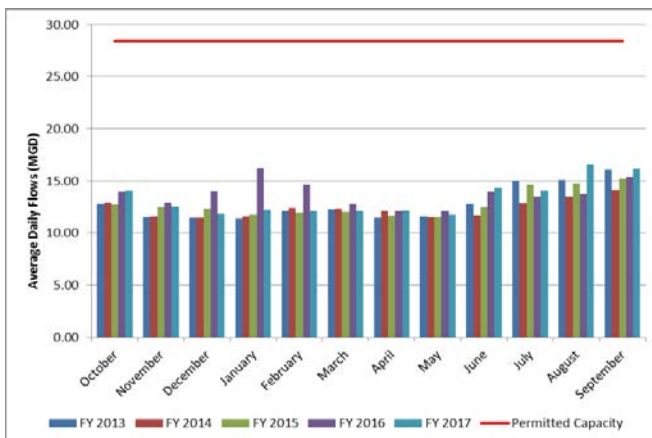
using excess aeration basin capacity.

As shown on **Figure 4-6**, total flows to the system have increased reflecting population changes but remain at almost half of the system's capacity. Large flows were observed in FY 2017 (**Table 4-3**) due to an abnormally wet season.

**Table 4-3 Combined WRF Flow Data FY2017**

Month	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)	Minimum Daily Demand (MGD)
<b>FY 2017</b>			
Oct-16	14.07	19.64	11.98
Nov-16	12.53	13.95	10.84
Dec-16	11.84	12.62	10.76
Jan-17	12.24	13.71	11.54
Feb-17	12.12	15.76	9.13
Mar-17	12.07	13.26	10.89
Apr-17	12.13	13.99	10.72
May-17	11.79	13.77	9.99
Jun-17	14.29	18.79	10.26
Jul-17	14.03	16.50	12.60
Aug-17	16.61	36.33	12.47
Sep-17	16.14	21.05	13.44

**Figure 4-6 Combined WRF Inflow FY 2013 - FY 2017**



The existing wastewater treatment system currently serves approximately 137,000 residents and is expected to serve additional residents as the City executes its Utility Expansion Plan to provide water, wastewater and reclaimed water services to areas north of Pine Island Road.

During FY 2017, the Water Reclamation system was

able to remain in full operation during two unprecedented events, a 200-year rain event in August and Hurricane Irma in September. The plants utilized the excess aeration basin capacity to handle the excess flows and plants discharged to the deep injection wells.

#### 4.7 SUMMARY OF MAJOR EQUIPMENT AT WATER RECLAMATION FACILITIES

A listing of major equipment located at both Everest and Southwest Water Reclamation Facilities is included in **Table 4-4**. The major process equipment and general operating conditions of the facilities are in good working order. Most structures are new or have undergone recent upgrades or rehabilitation. As a result, many of the facilities and equipment are in very good condition.

The Everest WRF is staffed with a chief operator, 10 certified wastewater treatment plant operators and five maintenance department staff. The facility operates 24 hours per day, 7 days per week and is led by a chief operator with a Class A Wastewater Treatment license. The maintenance department is comprised of full time mechanics, electricians and instrumentation technicians. The Everest WRF Operations and Maintenance Divisions are responsible for the treatment of wastewater, facility upkeep, and functionality of Plant equipment. A Utility programmer maintains the SCADA system and FDEP data.

The Southwest WRF is currently staffed with a chief operator, 10 certified wastewater treatment plant operators and five maintenance staff. The facility operates 24 hours per day, 7 days per week and lead by a chief operator with a Class A Wastewater Treatment license. The maintenance department is comprised of full time mechanics, electricians and instrumentation technicians. The Southwest WRF Operations and Maintenance Division is responsible for facility upkeep and functionality of equipment and instrumentation. A separate bio-solids Division stationed at the facility is responsible for dewatering and disposal of bio-solids. A utility programmer maintains FDEP data and the facility's SCADA system.

An increase in staff is required to address the lift stations added with the North 2 UEP; FOG (Fats Oil Grease) issues, and succession in planning. Proposed staff positions include a lift station technician, a water reclamation technician, and senior operators.

**TABLE 4-4**  
**WATER RECLAMATION FACILITY MAJOR**  
**PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
<u>Plant Influent</u>		
Average Daily Flow (MGD)	13.4	15.0
Peak Instantaneous Flow (MGD)	37.1	45
<u>Preliminary Treatment</u>		
Influent Flowmeter	1	4
Diameter (inches)	36	20, 20, 30, 42
Type	Electromagnetic	Electromagnetic
Screenings		
Manual Screen	1	1
Width x Depth(inches)	36 x 78	42 x 78
Spacing(inches)	0.75	0.625
Capacity (mgd)	13.6	23
Mechanical bar screen	2	2
Type	Rake	Step
Width & Depth(inches)	36 x 78	36 x 66
Spacing(inches)	0.25	0.20
Capacity (mgd) (each)	19	23
Horsepower (min/max)	2/5	3
Screenings Conveyor	2	1
Type	Shaftless	Shaftless
Capacity (cu/ft/hr)	n/a	200
Horsepower	5	5
Grit Chamber	2	4
Type	Vortex	Head Cell
Size (mgd) each	30	15
Grit Cyclone Classifier	2	2
Type	Cyclone/Classifier	Cyclone/Classifier
Capacity (gpm) each	220	315
Horsepower	1.0	0.3
Grit Pump	2	4
Drive	Constant	Constant
Type	Recessed Impeller	Recessed Impeller
Flow (gpm) each	220	210
Horsepower	10	15

**TABLE 4-4 (continued)****WATER RECLAMATION FACILITY  
MAJOR PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
<u>Secondary Treatment</u>		
Aeration Basin	4	3
Type	Single Pass/Plug Flow	Single Pass/Plug Flow
Side Water Depth (feet)	Varies by zone	20.9
Overall Width (feet)	52	41.5
Overall Length (feet)	200	258
Total Volume (million gallon) each	1.13	1.67
Waste Activated Sludge Rate (lb/day)	12,500	TBD
Recirculation Ratio for RAS Range%	30-100	30 - 100
Influent Channel	1	1
Length (feet)	185.5	130.5
Width (feet)	10	10
Sidewater Depth (feet)	16.61	22.65
Volume (million gallon) each	0.230	0.22
Mixer	4	3
Motor/Blade (hp)	3	1 @ 5/5 2 @ 5/3
Anaerobic Zone	4	3
Length (feet)	31	25.33
Width (feet)	20	26
Sidewater Depth (feet)	15.75	22.4
Volume (million gallon) each	0.073	0.11
Mixer	4	3
Motor	3	5
Anoxic Zone	8	3
Length (feet)	52.20	56.25
Width (feet)	20	26
Sidewater Depth	15.74	21.6
Volume (million gallon) each	0.12	0.24
Mixer	3	9
Motor (hp)	3	5
Aerobic Zone	4	3
Length (feet)	127.5	196
Width (feet)	52	41.5
Sidewater Depth (feet)	14.56	20.9
Volume (million gallon) each	0.72	1.27
Diffuser (each)	1,828	3,170/per Basin
Type	Ceramic Fine Bubble	Ceramic Fine Bubble
Reaeration Channel (Effluent Channel)	1	1
Length (feet)	221.5	130.5
Width (feet)	6.5	6
Sidewater Depth (feet)	11.61	16.85
Volume (million gallon) each	0.13	0.1
Diffusers	Ceramic Fine Bubble	Removable Coarse Bubble

**TABLE 4-4 (continued)**

**WATER RECLAMATION FACILITY  
MAJOR PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
Aeration Basin Blower	3	3
Type	Multi-stage Centrifugal	Single-Stage Centrifugal
Capacity (scfm) each	5,150	8,667
Horsepower, each	300	450
Aeration Basin Blower	2	
Type	Single-Stage Centrifugal	N/A
Capacity (scfm) each	6,500	
Horsepower, each	300	
Internal Mixed Liquor Recycle Pumps	8	6
Type	Horizontal Axial Flow	Horizontal Axial Flow
Drive	Constant Speed	Constant Speed
Flow (gpm)	3,600	6,400
Flow (% ADF)	300	300
Head (feet)	4.25	4.05
Motor (hp)	15	20
WASC PUMPS	2	2
Type	Vertical Non-Clog	Submersible Non-Clog
Drive	Constant Speed	Constant Speed
Flow (gpm) each	90	300
Head (feet)	24	24
Motor (hp)	2.3	3.7
Waste Activated Sludge Pump PS 1	4	4
Type	Rotary Lobe	Rotary Lobe
Drive	Variable Speed	Variable Speed
Flow (gpm) each	125	140-300
Head (feet)	16	9.2
Motor (hp)	5	15
Return Activated Sludge Pump PS 1	3	3
Type	Horizontal Centrifugal	Screw Centrifugal
Drive	Variable Speed	Variable Speed
Flow(gpm) each	2,600	520 - 1740
Flow % ADF @ AD/@PHF	50%/100%	30 - 100
Head (feet)	32	14.2 – 23.4
Motor (hp)	30	25
Return Activated Sludge Pump PS 2	3	5
Type	Horizontal Centrifugal	Screw Centrifugal
Drive	Variable Speed	Variable Speed
Flow (gpm) each	2,600	695 - 2605
Flow % ADF	50%/100%	30 - 100
Head	32	15 – 29.9
Motor (hp) each	30	30
Secondary Scum Pumps	3	5
Type	Submersible Non-Clog	Non-Submersible Rotary Lobe
Drive	Constant Speed	Constant Speed
Flow (gpm) each	200	200
Head (feet)	27.5	27.5
Motor (hp)	3.7	3.7

**TABLE 4-4 (continued)**  
**WATER RECLAMATION FACILITY**  
**MAJOR PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
Secondary Scum Pumps	1	N/A
Type	Centrifugal	
Drive	Constant Speed	
Flow (gpm) each	90	
Head (feet)	24	
Motor (hp)	2.3	
Secondary Clarifiers	4	3/2
Type	Circular Center Feed	Circular
Mechanism	Spiral Blade	Suction Header
Motor (hp) each	<sup>3</sup> / <sub>4</sub>	1
Diameter (feet)	110	120/100
Sidewater Depth (feet)	14	16/13.75
Surface Overflow Rate (Based on Influent Flow)		
At Peak Hourly Flow	973	822/1,260
Solids Loading Rate		
At Average, Daily Flow (lb/d/sq/ft)	15.4	8/10.5
At Peak Hour (lb/d/sq/ft)	44.3	30.2/31.5
<u>Tertiary Treatment</u>		
Filtration	4	4
Type	Auto Backwash Traveling Bridge	Auto Backwash Traveling Bridge
Length (feet)	120	84
Width (feet)	16	16
Filter Surface Area (sq. ft)	1,920	1,344
Surface Loading Rate		
Average, Dry Weather Flow (gpm/sf)	1.21	1.33
Peak Hour Flow (gpm/sf)	3.36	4
Filtration	N/A	14
Type		Continuous Backwash
Length (feet)		14.21
Width (Feet)		17.61
Filter Surface Area (sq. ft)		200
Surface Loading Rate		
Average, Dry Weather Flow (gpm/sf)		2
Peak Hour Flow (gpm/sf)		5
Chlorine Contact Tanks	4	2
Type	3-Pass	3-Pass
Capacity (mgd) each	18.55	15
Volume Each (gal)	99,858	177,725
Detention Time @ PHF (minutes)	15.3	17.2
Chlorine Contact Tanks	N/A	2
Type		3-Pass
Capacity (mgd) each		7.7
Volume Each (gal)		81,000
Volume Total (gal)		162,000

**TABLE 4-4 (continued)**

**WATER RECLAMATION FACILITY  
MAJOR PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
Alum Feed and Storage System		
Feed Pumps	2	4
Flow Range (gph)	140	60.2
Inject Pressure, Maximum (psi)	20/40	60
Storage Tanks	2	2
Volume (gal)	6,000	11,800
<u>Sodium Hypochlorite Feed &amp; Storage System</u>		
Storage Tanks	2	4
Day Tank Volume (gal) each	12,000	11,800
Recirculation Pump	1	1
Flow Range (gpm)	20	20
Chlorine Contact Tank Feed Pump	5/5	4/9
Flow Range (gph)	85.6/46.0	184/46
<u>Reclaimed Water Pumping/Storage</u>		
Transfer Pumps	6	4
Type	Vertical Turbine	Vertical Turbine
Drive	Variable	Variable
Flow (gpm)	5,150	10,420
Head (feet)	70	43
Motor (hp)	150	200
Reclaimed Water Storage Tanks	2	3
Volume (million gallon)	5	5
Diameter (feet)	140	160
Water Depth (MAX) (feet)	43.45	33.25
Reclaimed Water Pumps (Distribution)	6	8
Type	Vertical Turbine	Vertical Turbine
Drive	Variable	Variable
Flow (gpm)	5,000	4,600
Head (hp)	173	173
Motor	300	250
Reject Water Storage Tanks	N/A	1
Volume (million gallon)		6.8
Diameter (feet)		170
Water Depth (MAX)		41
Reject Water Pump	N/A	2
Type		Vertical Turbine
Drive		Constant
Flow (gpm)		700
Head (feet)		40
Motor		20
Deep Injection Well Pumps		Uses Reuse Pumps
Number	2	
Motor (hp)	500	

**TABLE 4-4 (continued)**  
**WATER RECLAMATION FACILITY**  
**MAJOR PROCESS EQUIPMENT**

	<u>Everest WRF</u>	<u>Southwest WRF</u>
<u>Solids Stream – Biosolids</u>		
WAS Storage Tank	2	2
Volume (million gallon) each	0.120	1.16
WAS Storage Blower	N/A	4
Type		Rotary Positive Disp.
Drive		Constant
Capacity (scfm)		3,000
Motor (hp)		150
Diffuser Type	Coarse Bubble	Coarse Bubble
WAS Transfer Pumps	3	3
Type	Centrifugal/ Rotary Lobe	Rotary Lobe
Drive	Variable	Constant
Flow (gpm)	250	300
Head (feet)	139	35
Motor (hp)	20	20
Waste Holding Tanks	N/A	2/2
Volume (gallons) each		235,000/553,000
Diameter (feet)		50
Water Depth (max) (feet)		16
Coarse Bubble Diffusers per Tank		80
Diffuser Flow Rate		12
Existing Blowers	N/A	3/4
Type		Rotary Positive Disp.
Drive		Constant
Capacity		1140
Horsepower		75
Centrifuges	N/A	3
Diameter (inches)		23.23
Operating speed (RPM)		3,000
Force (G)		2,968
Overall Length x Width (inches)		207.91 x 81.9
Overall Height (inches)		69.01
Total Connected Load (HP)		200
Polymer System	N/A	1
Dry Polymer Feed Capacity (lbs/hr)		250
Liquid Polymer Feed Capacity (gph)		2
Mixing Time (min)		60
Batch Size (gallons)		1000
Polymer Solution Concentration (%)		0.5 – 2.0
Polymer Feed Pumps	N/A	3
Type		Metering
Drive		Variable
Flow		0 - 3
Max Discharge (psi)		100
Motor (hp)		

Safety is a top priority for the City. No safety incidents were recorded at any of the Water Reclamation facilities during FY 2017. The City's success in this regard stems from the efforts of the safety committee. The safety committee schedules monthly staff safety meetings on various topics ensuring safety for the staff and facility. OSHA requirements are reviewed and appropriate training sessions regarding specific safety topics are held. All staff members are provided training on standard operating procedures and safety equipment, and receive bi-weekly safety handouts for review. Monthly staff safety training includes: lockout tag-out, hazardous waste spill or contact, confined space entry, safe driving and other topics applicable to plant work environment.

Everest WRF is not equipped to process bio-solids produced at this facility and must pump waste sludge via force main to the Southwest WRF. There is currently no plan other than to continue pumping the waste sludge to the Southwest WRF. As a result, the input of solids into the Southwest WRF is much greater than that of Everest WRF and operators account for the additional solids input. The biosolids dewatering and treatment facility located at the Southwest WRF processes the waste sludge. Recently a project to improve biosolids handling through the installation of centrifuges was completed in order to reduce the amount of biosolids transferred to the Lee County Solid Waste Facility and the associated hauling costs.

#### **4.8 SUMMARY OF MAINTENANCE AND MAJOR ACCOMPLISHMENTS AT WATER RECLAMATION FACILITIES DURING FY 2017**

Maintenance of equipment and general upkeep of the water reclamation facilities is performed by the maintenance staff. Maintenance schedules have been established for each of the facilities in which specific duties are performed on a daily, weekly, monthly, quarterly and annual basis. Work Orders generally consisted of routine equipment inspections and general maintenance. However, the City also carries out continuous improvements to the system. Several contracts are in place for refurbishment or replacement of large equipment such as motors or pumps.

Major maintenance items completed in the Water Reclamation Facilities in FY17 include:

- Re-coating of metal components in Clarifiers 1 and 2 metal at the Everest WRF
- Re-coating of metal components in Clarifier 3 at the Southwest WRF
- Everest WRF Headworks concrete repairs and protective lining installation
- Everest WRF #3 2000 KW generator rear main seal replaced
- Southwest WRF #4 2250 KW generator radiator replaced
- Third and final biosolids centrifuge installed and commenced operation in December 2016
- Everest WRF 80 ton AC unit replaced in Administration building
- Everest WRF and Southwest WRF UIC permits renewed
- Southwest WRF FDEP Operating permit renewed
- New biological odor control unit installed as a trial rental at Master Pump Station 540
- One bleach tank replaced at Southwest WRF
- Replaced all aeration diffusers in north sludge holding tank at Southwest WRF
- Replaced 55 lights at Everest WRF with new LED lights
- Southwest WRF secondary chlorine contact basins recoated

As noted previously, a very significant accomplishment during FY 2017 was the ability for Water Reclamation staff to maintain the wastewater treatment process without discharging into the river during two major storm events when influent flows were approximately 40 million gallons per day. The City of Cape Coral is one of a limited number of water reclamation facilities that were able to do this.

#### **4.9 COMPLIANCE WITH OPERATING PERMITS**

The Everest Water Reclamation Facility and Southwest Water Reclamation Facility operate under permit numbers FL0030007 and FLA455458, respectively. These permits are currently active with the following expiration dates: November 29, 2022 and October 24, 2021, respectively. Both facilities operated within their permitted capacities over the last year. Effluent disposal from both WRFs is permitted for public irrigation reuse. As a result, reclamation facilities are required to submit Discharge Monitoring Reports to the Florida Department of Environmental Protection (FDEP) on a monthly basis.

These reports were reviewed and found to consistently meet permit requirements. In addition, both WRFs are permitted for discharging into deep injection wells.

The Everest WRF infrequently uses the deep injection well and holds permit number 254592-002-UO, while the Southwest WRF operates the deep injection well frequently, due to the Southwest RO plant also discharging into the well, and holds a dual use permit, number 254598-002-UO which expires July 5, 2022. Underground Injection Control Monthly Operating Reports were provided by the City for review. The reports include the total daily flow and chemical characteristics of the water. Reports are submitted routinely to FDEP that monitor the discharge from the facilities into the injection wells. These reports were evaluated and found to be consistently in compliance with requirements during FY 2017.



## Chapter 5 Irrigation Quality (IQ) Water System

### 5.1 GENERAL OVERVIEW OF IQ WATER SYSTEM

The City's Irrigation Quality (IQ) Water System includes: fresh water canals and canal withdrawal facilities; reclaimed water storage and pumping facilities; and an IQ water distribution system. A map of the IQ Water System is presented in **Figure 5-1**.

### 5.2 RAW WATER SUPPLY

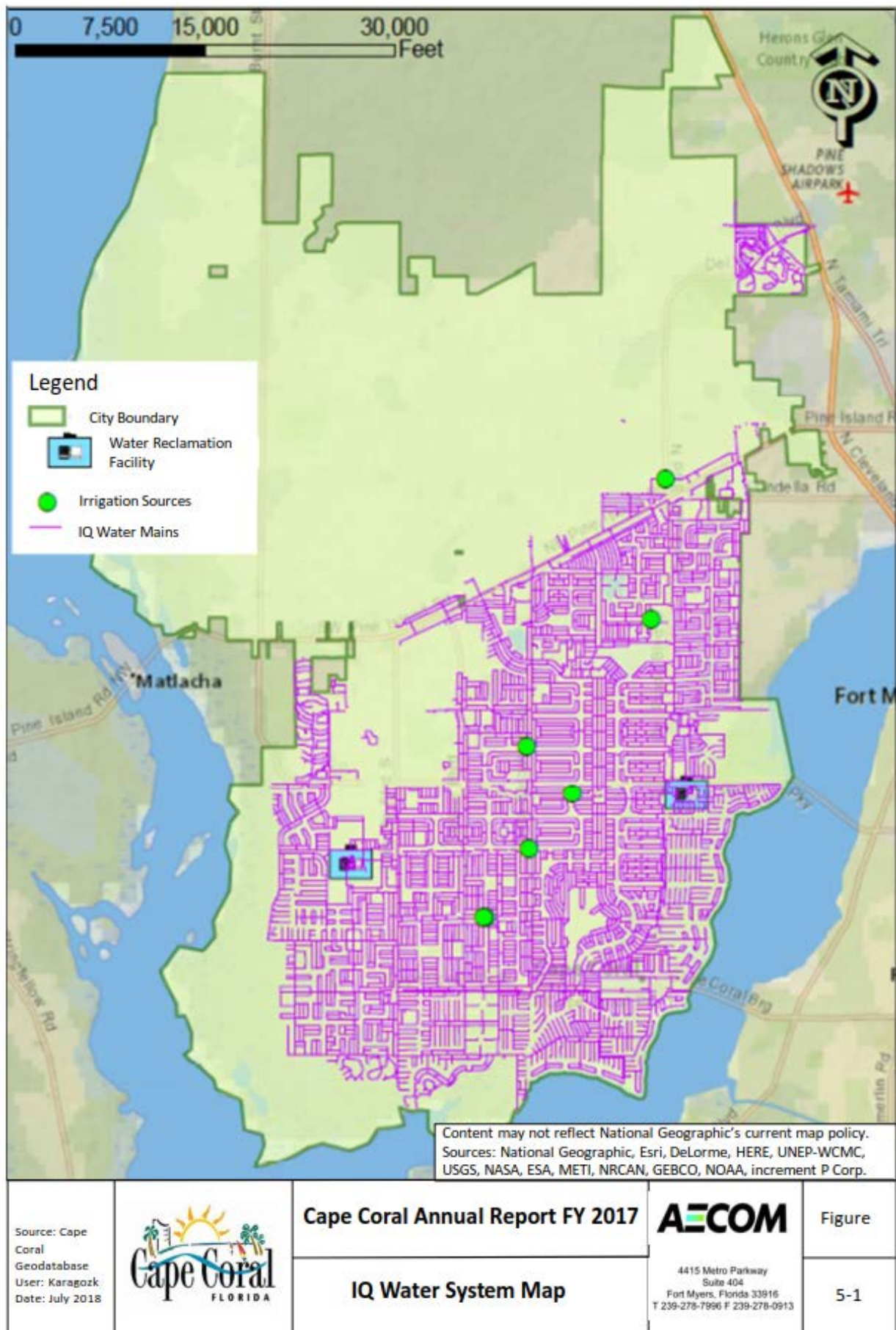
The City's primary source of IQ water supply is the network of freshwater canals. Five City-owned and operated canal pump stations draw water from fresh water canals in the City and pump it directly into the IQ water distribution system after screening and chlorine injection (for disinfection). As water levels decline in the southern canals, a transfer pump station is utilized to pump water from canals north of Pine Island Road into the southern canal system.

The City's five canal pump stations have a combined total pumping capacity to provide approximately 59,200 gpm (85.2 MGD) of irrigation and fire

protection to meet future demands. The stations are in good condition and are very well maintained.

The City has recognized the need to increase the use of canal water as its primary supply to the irrigation quality water system. To meet future demand the City has several weir improvement projects underway and completed in the northern part of the City to capture more water for irrigation use and for level maintenance of the fresh water canal system.

The 2011 Irrigation and ASR Master Plan laid out a plan for improvements including the incorporation of Aquifer Storage and Recovery. Currently, near the end of the wet season, the City raises eight weirs to capture an additional 1-vertical foot of water in the canals, upstream of the weirs, which equates to approximately 500 million to 600 million gallons of additional water stored. This volume is equivalent to approximately two months of canal water pumped for the irrigation demands.



The Canal Water Supply System is in good operating condition and it is recommended that the City continue proceeding with completing the weir improvement projects as well as other considerations to assist in maximizing system storage.

The City is currently pursuing several alternatives to increase its irrigation water availability and reduce demands on the canal system:

- Construction of a new canal pump station and pipeline to support the North 2 UEP.
- A test Aquifer Storage and Recovery (ASR) well was installed in order to investigate the potential of storing excess water in the aquifer during the wet season with recovery during the dry season.
- A pilot pumping test was carried out to evaluate the feasibility of using inactive mining pits at the Southwest Aggregates Mine located in south Charlotte County as a surface water source to supply water to the Cape Coral canals.
- Pursuing the permitting for Weir 29 which will increase storage capacity in the canal network.
- Working with the City of Fort Myers regarding the potential of constructing an interconnect pipeline which would allow transfer of excess reuse water from Fort Myers to Cape Coral.
- Construction of a pipeline to convey reclaimed water from FGUA to the City.
- Removal of fire suppression from the irrigation system.

### 5.3 RECLAIMED WATER SUPPLY

Effluent from both the Everest WRF and the Southwest WRF are used as secondary sources of supply for the IQ water system. The City's goal is to utilize 100% of the plant effluent for IQ water supply. However, the plants provide less than 50% of the total IQ water demand. There are two 5-million gallon storage tanks at the Everest WRF, and Southwest WRF has three 5-million gallon storage tanks. When these are full, excess treated effluent is pumped into the deep injection wells or discharged into the Caloosahatchee River. However, no effluent was discharged into the river in FY 2017.

The reclaimed water is pumped into the IQ water distribution system via high service pumps located at each WRF. The reuse pumps at the Southwest WRF

consist of eight 250 hp pumps that have a capacity of 4,600 gpm at 175 feet TDH. The reuse pumps located at the Everest WRF consist of six 300 hp pumps that have a capacity of 5,000 gpm at 173 feet TDH each.

The reclaimed water supply system is in good operating condition. The City efforts to increase irrigation water availability should continue to meet future demands.

### 5.4 IRRIGATION QUALITY WATER DISTRIBUTION SYSTEM

The Irrigation Quality Water Distribution System includes approximately 790 miles of distribution mains, 65,674 service connections and 863 IQ water system fire hydrants. The IQ water distribution system is operated and maintained by the UCD Division. The UCD has an ongoing fire hydrant maintenance program that includes flushing, repairing and repainting the hydrants. IQ water mains are also flushed daily as part of general maintenance. The UCD also maintains and checks backflow devices that are installed to prevent backflow and cross connection of IQ water.

In an effort to encourage irrigation water conservation during the dry season, the Utilities Department temporarily increased funding for enforcement of watering schedules throughout the City.

The distribution mains, service connections and fire hydrants are maintained in good condition. Besides regular maintenance and upgrades, no major improvements or expansions to the IQ water distribution system are necessary at this time other than the canal pump station and pipelines, which will be installed as part of the North 2 UEP. There are long term plans to completely remove fire protection from the irrigation system to reduce demands on the system.



## Chapter 6 Capital Improvements

### 6.1 GENERAL OVERVIEW

The City of Cape Coral prepares a five-year Capital Improvement Plan (CIP) on an annual basis. The CIP is continuously adjusted throughout each fiscal year and it is not uncommon for modifications to be made as a result of budgetary constraints and/or changes in priorities.

In fiscal year 2017, there were approximately ninety Projects completed relating to the water and wastewater infrastructure upgrades that totaled \$9,416,223.

Major Capital Project upgrades made to the water and wastewater infrastructure include:

- Construction of the Southwest RO Warehouse
- Southwest RO Structural Improvements
- Galvanized Pipe Replacement of Section 3A and 3B.
- Rehabilitation of 62 Manholes
- Installation of Biosolids Centrifuge
- Basin 365 Pipe Lining. (I&I)

In addition to these major Capital Projects identified in the City's CIP, the facilities and infrastructure have

also been upgraded by several smaller projects that will help increase the overall efficiency of operation.

The CIP for fiscal years 2018-2023 is provided in **Table 6-1**. As indicated in the CIP, approximately 70 million dollars is earmarked for Capital Projects over the next 6 years. The Capital Projects have been designated to address upgrades and repairs within the infrastructure. This is done to ensure that the City's facilities continue to comply with standard regulations while maintaining the ability to effectively meet service demands.

Major projects to be implemented over the next five years include:

- Development of a Hydrogeologic Model to optimize aquifer management
- Update of the Utilities Master Plan
- Retrofit of the Southwest RO WTP Control Systems
- Construction of a 10 MG Irrigation Quality Water ground storage tank
- Construction of deep injection well at North RO WTP
- Rehabilitation of raw water wells at North RO WTP

Table 6-1 Five Year CIP

## FUNDED CAPITAL PROJECTS

PROJECT #	COMMON DESCRIPTION	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
1	UCD-11 Meter Replacement Prog	500,000				500,000	500,000	1,500,000
2	UCD-12 Road Surfacing Adj	500,000				500,000	500,000	1,500,000
3	NRO-9 Distribtn Sys Automate	-				250,000		250,000
4	NRO-10 Rehab/Rpl Raw Wtr Well	800,000				1,600,000	1,600,000	4,000,000
5	ADM-24 Land Purchases	475,000				590,000		1,065,000
6	IRR-1 Weir Improvements	1,000,000				1,500,000		2,500,000
7	WRC-1 Lift Station Rehab FY18	2,000,000				-		2,000,000
8	IRR-2 NE 10MG Stor Tank & Pump	100,000				-		100,000
9	IRR-3 SW (2) 5MG Stor Tank & Pump	1,200,000				-		1,200,000
10	WRC-5 LS Odor Control Rehab	75,000				-		75,000
11	ADM-1 Smoke Testing I&I	50,000				100,000	100,000	250,000
12	ADM-6 Galvanized Pipe Rpl 2B	1,350,000				-		1,350,000
13	ADM-10 Fire Sprnkler ConvFY18	500,000				-		500,000
14	ADM-15 Potable Wtr Infr FY18	1,000,000				-		1,000,000
15	UCD-4 Manhole Rehab FY18	500,000				-		500,000
16	ADM-21 Infiltrn & Inflow FY18	750,000				-		750,000
17	SRO-2 Plt 2 Bldg Replacement	-				50,000		50,000
18	NRO-3 Reconst Van Loon PS Bldg	-				-	750,000	750,000
19	IRR-10 Reuse Sys Improve FY18	1,000,000				-		1,000,000
20	ADM-50 Palm Tree Imprv PHII	-				2,400,000		2,400,000
21	SE 47th Terrace Streetscape	1,475,000				-		1,475,000
22	WRE/WRSW-2 Clarifier Ctng FY16	100,000				-		100,000
23	ADM-56 NE Reservoir	2,100,000				-		2,100,000
24	SRO-13 Plt 2 MCC Replacement	750,000				-		750,000
25	WRE-7 Headworks & Structl Ctg	200,000				-		200,000
26	ADM-62 Fiber Optics	750,000				500,000	500,000	1,750,000
27	ADM-63 WAS Line	1,000,000				-		1,000,000
28	ADM-65 FM/MOV/MPS Sys & Comm	500,000				-		500,000
29	ADM-71 North 2 Canal PS (9)(West) & (10)(East)	4,729,895				4,000,000	4,000,000	12,729,895
30	WRE-10 MCC Blower Conduit Clar	350,000				-		350,000
31	IRR-22 North 2 Non Assd Util & F/O	2,700,000				-		2,700,000
32	ADM-59 Burnt St-Casings Ph III	750,000				-		750,000
33	SRO-14 Ground Storage Tank Coating	500,000				-		500,000
34	WRSW-10 Refurb 3 Clarifiers	377,605				-		377,605
35	NRO-11 GST Exterior Coating	150,000				-		150,000
36	SRO-15 Facility Refurbs	500,000				-		500,000
37	WRE-12 Recoat Aeration Ext	200,000				-		200,000
38	WRSW-12 Bleach Cntmnt Ctg	300,000				-		300,000
39	WRSW-13 Replace 36" Reuse Valve	200,000				-		200,000
40	WRSW-16 CROM Tank Repair	300,000				-		300,000
41	ADM-60 Infiltrn & Inflow FY22	-				850,000		850,000
42	ADM-73 Infiltrn & Inflow FY23	-				-	850,000	850,000
43	ADM-55 ASR/IRR Supply FY22	-				3,000,000		3,000,000
44	ADM-74 ASR/IRR Supply FY23	-				-	3,000,000	3,000,000
45	ADM-61 Irr to PW (F/H) FY22	-				1,500,000		1,500,000
46	ADM-75 Irr to PW (F/H) FY23	-				-	500,000	500,000
47	IRR-20 Reuse Sys Improve FY22	-				350,000		350,000
48	IRR-20 Reuse Sys Improve FY23	-				-	350,000	350,000
49	NSRO-3 Replace Membranes	-				2,000,000	600,000	2,600,000
50	WRE-8 Rehab Biosolids Bldg	-				1,100,000		1,100,000
51	WRC-14 Lift Station Rehab FY22	-				2,000,000		2,000,000
52	WRC-14 Lift Station Rehab FY23	-				-	2,000,000	2,000,000
53	UCD-10 Manhole Rehabs FY22	-				500,000		500,000
54	UCD-13 Manhole Rehabs FY23	-				-	500,000	500,000
55	ADM-70 Potable Wtr Infr FY22	-				300,000		300,000
56	ADM-72 Potable Wtr Infr FY23	-				-	300,000	300,000
57	WRSW-14 RAS Roof Mod	-				200,000		200,000
58	WRSW-15 Conc & Liner Repair	-				200,000		200,000
		29,732,500	-	-	-	23,990,000	16,050,000	69,772,500



## Chapter 7 Financial Review

### 7.1 GENERAL

The City of Cape Coral's (the "City") water and sewer utility system (the "System" or the "Utility") is established as an enterprise fund. As such, the System should have revenues equal to the costs of the services provided and should establish rates sufficient to cover the cost of operating, maintaining, repairing and financing the System. According to the Governmental Accounting Standards Board, "Enterprise Funds should be used to account for operations that are financed and operated in a manner similar to private business enterprises – where the intent of the governing body is that the costs of providing services to the general public on a continuing basis should be financed or recovered primarily through user charges."

The City annually reviews the financial position of the System as part of the budgetary process, and periodically conducts a formal rate study to evaluate the sufficiency of its rates. The City's monthly user rates were last adjusted on October 1, 2013; therefore, for Fiscal Year 2017 the City did not adjust the water and sewer monthly rates for service. The City's comprehensive rate study report, which is updated by the City periodically, should be read in its entirety to better evaluate the estimated future revenue sufficiency of the System.

In order to fund past capital investments associated with upgrading and expanding the Utility System, the City has utilized several different forms of long-term debt as follows:

- Water and Sewer Refunding Revenue Bonds
- Utility Improvement Refunding Assessment Bonds
- Notes Payable

The Water and Sewer Refunding Revenue Bonds are generally secured by a senior-lien pledge of the user fees and charges as well as other capital and miscellaneous fees received from the ongoing operations of the Utility (the "Senior Lien Bonds"). The Water and Sewer Notes Payable are secured by a junior-lien pledge of such System revenues after the payment of the Senior-Lien Bonds. The Utility Improvement Refunding Assessment Bonds are secured by a pledge of the proceeds derived from the City's various water and sewer special assessment programs.

The purposes of this section of the report include:

- Providing a description of the outstanding obligations of the Utility System, specifically the Senior Lien Bonds.
- Discussions of the covenants and commitments entered into by the City as required by the Bond Holders.
- A summary of the results of debt service coverage compliance test as set forth in the Bond Resolution, as amended from time to time, including the Springing Resolution that became effective October 1, 2016 (i.e., the debt service coverage compliance test).

## 7.2 OUTSTANDING DEBT

As discussed in the previous section, the City has utilized several different forms of long-term debt to fund the capital investment needs of the System. In Fiscal Year 2017, the City issued the Utility

Improvement Refunding Assessment Bonds, Series 2017 to refund all of the City's outstanding assessment-related debt to obtain an economic gain:

- Water Improvement Assessment Bonds (Southwest 3 Area), Series 2003;
- Wastewater and Irrigation Water Refunding Assessment Bonds (Southwest 1, Pine Island Road, and Southwest 3 Areas), Series 2005;
- Utility Improvement Assessment Bonds (Southwest 2 Area), Series 2005;
- Utility Improvement Assessment Bonds (Southwest 1 Area), Series 2006;
- Utility Improvement Assessment Bonds (Southwest 4 Area), Series 2007;
- Utility Improvement Assessment Bonds (Southwest 5 and Surfside Areas), Series 2007;

**Table 7-1** summarizes the long-term debt outstanding as of September 30, 2017 as follows:

TABLE 7-1			
Listing of Long-Term Outstanding Debt			
Description	Series	Original Issue Amount	Amount Outstanding
<b>Revenue Bonds [1]</b>			
Water and Sewer Refunding Revenue Bonds [2]	2011	\$175,000,000	\$164,125,000
Water and Sewer Refunding Revenue Bonds [3]	2011A	106,560,000	99,280,000
Water and Sewer Refunding Revenue Bonds [4]	2013	10,440,000	2,145,000
Water and Sewer Refunding Revenue Bonds [5]	2015	72,415,000	72,415,000
Water and Sewer Refunding Revenue Bonds [5]	2015A	94,740,000	89,095,000
Revenue Bonds Sub-Total		\$459,155,000	\$427,060,000
<b>Notes Payable</b>			
State Revolving Fund Loan Agreement #7516P [6]	2004	\$13,856,923	\$1,062,671
State Revolving Fund Loan Agreement #7516L 01 [6]	2003	7,224,652	268,149
State Revolving Fund Loan Agreement #7516L 02 [6]	2005	35,848,122	1,312,523
State Revolving Fund Loan Agreement #DW360103 [7]	2016	16,668,746	12,401,582
State Revolving Fund Loan Agreement #WW360100 [7]	2016	72,349,275	52,814,122
Notes Payable Sub-Total		\$145,947,718	\$67,859,047
<b>Special Assessment Debt</b>			
Utility Improvement Refunding Assessment Bonds [8]	2017	\$101,155,000	\$99,150,000
Special Assessment Debt Sub-Total		\$101,155,000	\$99,150,000
Total Debt as of September 30th, 2017		\$706,257,718	\$594,069,047
<p>[1] Secured by a senior lien pledge of net revenues and expansion fees.</p> <p>[2] Fully refunded the Bond Anticipation Notes and Series 2009 Revenue Bonds.</p> <p>[3] Bonds were issued to refinance certain commercial paper notes issued to finance, on an interim basis, certain capital improvements of the system.</p> <p>[4] Fully refunded the Water and Sewer Refunding Revenue Bonds, Series 2003.</p> <p>[5] Partially refunded the Water and Sewer Revenue Bonds, Series 2006, but which were fully-retired on October 1, 2016.</p> <p>[6] Secured by a junior lien pledge of net revenues and expansion fees.</p> <p>[7] Only the non-assessment portion of the annual payments are secured by a pledge of net revenues and expansions fees.</p> <p>[8] Bonds were issued to refinance all the City's outstanding utility improvement special assessment debt.</p>			

### 7.3 BOND RESOLUTION AND COVENANTS

Water and Sewer Resolution No. 98-86 adopted by City Council on August 20, 1986 as amended and supplemented (the "Bond Resolution"), sets forth the covenants the City has made pertaining to revenues, operating and maintenance ("O&M") expenses, debt service coverage, and other financial compliance issues. A summary of the covenants and financial compliance issues consists of the following:

- Operation and Maintenance
- Annual Budget
- Rates:
  - Schedule of Rates and Charges
  - O&M Expenses
  - Net Revenues
  - Debt Service Coverage
  - Renewal and Replacement (R&R) Requirements

- Books and Records
- Annual Audit
- Insurance

During Fiscal Year 2015, the City substantially refunded the Series 2006 Bonds, and in doing so, the City adopted Resolution No. 58-15, which provides for certain springing amendments to the existing Bond Resolution (the "Springing Resolution"). The Springing Resolution, among other things, clarified the definitions of Gross Revenues and Operating Expenses that provide for certain inclusions and exclusions from the Net Revenue categories. Examples from the Spring Resolution include the exclusion of market value gains and losses on investments and the exclusion of unfunded (non-cash) expenses associated with pension, retirement and healthcare obligations. Under the previous Bond Resolution, such amounts were included in the

determination of Net Revenues until the Water and Sewer Revenue Bonds, Series 2006 (the "Series 2006 Bonds") were completely retired on or before October 1, 2016 at such time the Springing Resolution became effective. To provide comparable financial results, this report was prepared under the requirements of the updated Bond Resolution, including the Springing Resolution, for Fiscal Years 2016 and 2017. As such, all capitalized terms used in this section of the report have the same meaning as prescribed in the revised Bond Resolution including the Springing Resolution amendments. The Bond Resolution and the Springing Resolution, which were made part of the 2015 and 2015A Official Statements, should be read in their entirety.

## 7.4 OPERATING AND MAINTENANCE

The City's "Operating and Maintenance" covenant states that:

*"The City of Cape Coral should maintain or cause to be maintained the system and all portions thereof in good condition and will operate or cause to be operated the same in an efficient and economical manner, making or causing to be made such expenditures for equipment and for renewals, repairs and replacements as may be proper for the economical operation and maintenance thereof."*

Based on an inspection of the water and sewer facilities, review of records, and discussions with the Utility's staff, the City's Consulting Engineer has concluded that the water and sewer systems are maintained in good condition and operate in an efficient and economical manner.

## 7.5 ANNUAL BUDGET

The City annually prepares and adopts, prior to the beginning of each Fiscal Year, an annual budget in accordance with State law. The budget is comprehensive and addresses all areas necessary for the complete operation of the Utility System. This estimate of revenues and expenditures, prepared in budget form, provides a basis for evaluating and controlling expenditures throughout the Fiscal Year.

## 7.6 RATES

Revenues should be generated from water and sewer user rates and charges in order to meet the annual

expenditure requirements and financial obligations of the System. In addition, the City must satisfy its rate covenant as specified in the Bond Resolution, which was not amended by the Springing Resolution. According to the Bond Resolution, the City:

*"...shall fix, establish and maintain such rates and collect such fees, rates or other charges for the product, services and facilities of the system, and revise the same from time to time, whenever necessary, as will always provide in each Fiscal Year, (1) Net Revenues, Expansion Fees and Special Assessment Proceeds (if pledged) adequate at all times to pay in each Fiscal Year at least one hundred twenty percent (120%) of the Annual Debt Service on all Outstanding Bonds becoming due in such Fiscal Year and one hundred percent (100%) of any amounts required by the terms of this resolution to be deposited during such Fiscal Year into the Reserve Account and the Renewal and Replacement Fund, and (2) Net Revenues in each Fiscal Year adequate to pay at least one hundred percent (100%) of (a) the Annual Debt Service on all Outstanding Bonds becoming due in such Fiscal Year and (b) any payments of Subordinated indebtedness which must be made during such Fiscal Year from the Net Revenues. Such rates, fees, or other charges shall not be reduced so as to be insufficient to provide adequate Net Revenues, Expansion Fees, and Special Assessment Proceeds for the purposes provided therefore by this Resolution..."*

In addition, in the event Variable Rate Bonds are outstanding at the commencement of a Fiscal Year, the City has agreed to budget interest payable on such Bonds during such Fiscal Year at a rate equal to the lesser of (1) the highest interest rate such Bonds were bearing during the prior Fiscal Year; and (2) the Maximum Interest Rate applicable to such Bonds. Finally, if, in any Fiscal Year, the City fails to comply with the above requirements, it must cause the Rate Consultant to review its rates, fees, tolls, charges, income, Gross Revenues, Operating Expenses, and methods of operation and to make recommendations as to the methods by which the City may promptly seek to comply with the above requirements. The City must thereafter implement such recommendations to the extent required to comply with the above rate covenant thereafter.

### 7.6.1.RATES AND CHARGES

The City's monthly user rates were last adjusted on October 1, 2013; therefore, for Fiscal Year 2017 the City did not adjust the water and sewer monthly rates for service. However, the City did implement new Utility Capital Expansion Fees to recover the capital costs necessary to serve new customers of the System. The following tables summarize the water and sewer rates, fees, and charges that were effective during Fiscal Year 2017:

TABLE 7-2	
Water and Irrigation Rate Schedule	
Description	Amount Billed FY 2017
<b>Water Rates:</b>	
<u>Monthly Capacity Service Charge</u>	
(All Classes by Meter Size)	
5/8"	\$17.32
1"	43.32
1-1/2"	86.63
2"	138.61
3"	277.23
4"	433.17
6"	866.34
8"	1,386.14
10"	1,992.58
<u>Residential Commodity Charge</u>	
(per Thousands of Gallons for Water)	
Block 1 – 0 -5,000	\$3.90
Block 2 – 5,001 - 10,000	4.55
Block 3 – 10,001 - 15,000	6.86
Block 4 – 15,001 - 20,000	10.25
Block 5 – 20,001 - 30,000	11.32
Block 6 – 30,001 and Above	12.44
<u>Commercial Commodity Charge</u>	
(per Thousands of Gallons for Water)	
Block 1 – 0 -25,000	\$5.06
Block 2 – 25,001 - 50,000	5.70
Block 3 – 50,001 and Above	6.86
<b>Irrigation Rates:</b>	
Residential and Duplex	\$9.50 per Month
Non-Metered Multi-Family Residential and all Non-Residential Users with 1" Diameter and Smaller Service	\$0.0012 x Sq. Ft. of Total Property Area
Metered Multi-Family Residential and all Non-Residential Users Greater than 1" Meter	\$0.50 per 1,000 Gallons Metered

TABLE 7-3

**Sewer Rate Schedule**

Description	Amount Billed FY 2017
<b>Sewer Rates:</b>	
<u>Monthly Capacity Service Charge</u>	
(All Classes by Meter Size)	
5/8"	\$21.07
1"	52.67
1 1/2"	105.35
2"	168.56
3"	337.11
4"	526.74
6"	1,053.49
8"	1,685.58
10"	2,423.02
<u>Commodity Charge for Sewer</u>	
For All Metered Water Consumption	\$9.04

TABLE 7-4	
Water and Sewer Miscellaneous Charges	
	Amount Billed
Description	FY 2017
<b>Customer Deposits:</b>	
<u>Residential</u>	
5/8"	\$100.00
<u>Commercial (per Meter)</u>	
5/8"	\$100.00
1"	130.00
1 1/2"	255.00
2"	350.00
Each Inch Above 2"	120.00
<b>Turn-On / Turn-Off for Existing Customers During Business Hours</b>	
	\$20.00
<b>Turn-On / Turn-Off for Existing Customers During Non-Business Hours</b>	
	\$25.00
<b>Installation of Meters</b>	
5/8-inch Meter, per installation	\$310.00
1-inch Meter, per installation	340.00
Over 1-inch Meter	Actual Cost
<b>Delinquent Charge: Charge Due if Payment is Not Received on or Before the Payment Due Date</b>	
	\$5.00
<b>Reconnection Fee</b>	
	\$80.00
<b>Water Meter, Reinstallation:</b>	
5/8" Meter	\$25.00
1" Meter	\$30.00
Over 1" Meter	Actual Cost
<b>Meter Tests Deposits [1]</b>	
5/8" and 1"	\$22.00
Greater than 1"	28.00
<b>Fire Line for Potable Water Fire Service</b>	
<u>Fire Line Size</u>	Fixed Annual Service Charge
1"	\$75.79
2"	151.58
4"	303.15
6"	454.75
8"	606.33
10"	757.90
12"	909.48
<b>Fire Line for Irrigation Water Fire Service [2]</b>	
<u>Fire Line Size</u>	Fixed Annual Service Charge
1"	\$50.00
2"	100.00
4"	200.00
6"	300.00
8"	400.00

TABLE 7-4 (cont'd.)				
Water and Sewer Miscellaneous Charges				
Fire Line for Irrigation Water Fire Service [2]			Fixed Annual	
Fire Line Size			Service Charge	
10"			500.00	
12"			600.00	
Contributions-in-Aid-of-Construction (CIAC) Fees [3]		Water	Wastewater	Irrigation
Single-Family Residential Duplex (5/8" Meter)		\$3,200	\$6,500	\$2,400
Multi-Family (per Dwelling)		2,208	4,485	1,656
Residential (if Applicable), Non-Residential				
5/8"		\$3,200	\$6,500	\$2,400
1"		8,000	16,250	6,000
1.5"		16,000	32,500	12,000
2"		25,600	52,000	19,200
3"		51,200	104,000	38,400
4"		80,000	162,500	60,000
6"		160,000	325,000	120,000
8"		256,000	520,000	192,000
10"		368,000	747,500	276,000
12"		496,000	1,007,500	372,000
		Water With	Water Without	
Utility Capital Expansion Fees		Irrigation	Irrigation	Irrigation
Single-Family Residence – 5/8		\$2,658	\$1,320	\$2,318
Multi-Family (per Dwelling Unit) – 5/8"		1,834	911	1,599
		Sewer	Sewer	
		District 1	District 2	
Single-Family Residence – 5/8"		\$2,529	\$3,112	
Multi-Family (per Dwelling Unit) – 5/8"		1,754	2,147	

[1] If the meter is found to register in excess of accurate limits prescribed by standards set forth in the ordinance, the deposit will be refunded; but if below such accuracy limits, the deposit will be retained by the City as a service charge for conducting the test (Ordinance Nos. 23-75, 63-89,10-10-89).

[2] City Code of Ordinance Chapter 19 Section 132: No new fire sprinkler system shall be installed on reclaimed water mains constructed within the City.

[3] CIACs (previously known as Betterment Fees) are one-time fees charged when properties are not in an assessment area but have City services available.

### 7.6.2. REVENUES

Gross Revenues are primarily derived from monthly water and sewer user rates and charges, but also include miscellaneous revenues such as turn-on / turn-off fees, installation charges, and certain income such as investment earnings. The Springing Resolution, which became effective on October 1, 2016, amends the definition of "Gross Revenues" as:

*"All income and moneys received by the Issuer from the rates, fees, rentals, charges, and other income to be made and collected by the Issuer for the use of the products, services and facilities to be provided by the System, or otherwise received by the Issuer or accruing to the Issuer in the management and operation of the System, calculated in accordance with generally accepted accounting methods employed in the operation of public utility systems similar to the System, including, without limiting the generality of the foregoing, (1) moneys deposited from the Rate Stabilization Fund into the Revenue Fund in accordance with the terms hereof, provided any moneys transferred from the Rate Stabilization Fund into the Revenue Fund in an amount not to exceed the Rate*

*Stabilization Amount within 120 days following the end of a Fiscal Year may be designated by the Issuer as Gross Revenues of such prior Fiscal Year may be designated by the Issuer as Gross Revenues of such prior Fiscal Year; provided, however, Gross Revenues shall not include any such deposits from the Rate Stabilization Fund in calculating Net Revenues for purposes of Sections 5.04(A)(2) and 6.02(2)(a) hereof, (2) proceeds from use and occupancy insurance on the System, (3) all income and earnings derived from the investment of moneys in the funds and accounts established hereunder, other than the Rebate Fund, and (4) Operating Government Grants, "Gross Revenues" shall not include (1) any Capital Government Grants, (2) Water Expansion Fees, (3) Sewer Expansion Fees, (4) Irrigation Expansion Fees, (5) moneys deposited to the Rate Stabilization Fund from the Surplus Fund, including any moneys transferred from the Surplus Fund to the Rate Stabilization Fund within 120 days following the end of a Fiscal Year which the Issuer determines not to be Gross Revenues of such prior Fiscal Year, (6) Special Assessments, (7) any portion of Betterment Fees (levied and collected pursuant to Section 19-38 of the Code of the Issuer), or other similar fees or charges, which is not directly related to costs incurred by the Issuer for labor and material expended for hooking up new customers, and (8) any gain resulting from the valuation of investment securities or Hedge Agreements at market value and any other gain that does not require or result in the receipt of cash."*

#### **7.6.2.1. WATER AND SEWER ACCOUNTS (METERS) AND FLOWS**

**Table 7-5** provides a summary of water and sewer customer accounts as provided by the City's customer service division. For Fiscal Year 2017, the water system served approximately 60,849 average accounts and the sewer system served approximately 59,622 average active accounts. Approximately 98% of all water accounts have sewer service, while the remaining accounts have water-only service. Based on additional information provided by the City, single-family and multi-family customers account for 96% of total customers serviced. The remaining water and sewer customers reflect commercial, institutional and city service and account for only 4% of the total System.

In addition to the customer information, **Table 7-5** summarizes the total water and sewer gallons (expressed in thousands of gallons or kgals) billed in Fiscal Year 2017, which totaled 3,453,977. When compared to Fiscal Year 2016, total System accounts increased approximately 2.8% from Fiscal Year 2016 to 2017 while total water sales billed increased approximately 8.8%. It should be noted that the increases in billed water and wastewater flows that occurred in 2017 may have been a result of, in part, weather conditions, and therefore, the higher sales levels may not be sustainable in future years. The following table provides a summary of customer accounts and total System sales for Fiscal Years 2016 and 2017.

TABLE 7-5			
Accounts and Flow Summary [*]			
Annual Average Number of Accounts			
Description	FY 2016	FY 2017	Percentage of Total
<b>Water</b>			
Residential	48,816	50,344	82.74%
Duplex	3,832	3,993	6.56%
Multi-Family	3,813	3,781	6.21%
Commercial	2,138	2,180	3.58%
City	161	126	0.21%
Irrigation	71	47	0.08%
Fireline	366	378	0.62%
<b>Total Active Units</b>	<b>59,197</b>	<b>60,849</b>	<b>100.00%</b>
<b>Sewer</b>			
Residential	48,044	49,907	83.71%
Duplex	3,703	3,848	6.45%
Multi-Family	3,731	3,719	6.24%
Commercial	2,059	2,102	3.53%
City	48	46	0.08%
<b>Total Active Units</b>	<b>57,585</b>	<b>59,622</b>	<b>100.00%</b>
<b>Total Water Gallons Billed</b>	<b>3,176,146,960</b>	<b>3,453,976,700</b>	
<b>Total Sewer Gallons Billed</b>	<b>3,066,737,300</b>	<b>3,196,145,600</b>	
[*] Provided by the City of Cape Coral Customer Service Department.			

#### 7.6.2.2. CAPITAL EXPANSION FEES

The authorizing Bond Resolution, including the Springing Resolution and Florida law require that the City segregate Capital Expansion Fees from Gross Revenues and deposit such amounts into a separate fund. Section 4 of the Bond Resolution, including the Springing Resolution, provides details pertaining to the use of Capital Expansion Fees. Based on information provided by the City's Finance Department, **Table 7-6** summarizes the annual Capital Expansion Fee Revenue for Fiscal Years 2016 and 2017 as follows:

TABLE 7-6				
Summary of Capital Expansion Fee Revenues				
Description	Fiscal Year Ended September 30,		Increase / (Decrease)	
	2016	2017	Amount	Percentage
Amount Available [1]				
Capital Expansion Fees	\$4,879,039	\$7,726,264	\$2,847,226	58.4%
Capital Facility Expansion Charges [2]	6,036,378	7,654,772	1,618,394	26.8%
<b>Total Capital Expansion Fees</b>	<b>\$10,915,416</b>	<b>\$15,381,036</b>	<b>\$4,465,620</b>	<b>40.9%</b>
[1] Amounts available for debt service as provided by the City of Cape Coral Finance Department. Amounts exclude Betterment Fess (CIACs) as required by the Bond Resolution, including the Springing Resolution.				
[2] Amounts reflect Expansion Fees collected through Assessments.				

### 7.6.2.3. INTEREST INCOME

The Bond Resolution, including the Springing Resolution, provides for the inclusion of unrestricted interest income in the definition of Gross Revenues. The adjustments shown in the table below reflect the impact on income (for the purposes of calculating debt service coverage) based on the implementation of the Springing Resolution. Based on information provided by the Finance Department, **Table 7-7** shows the amount of unrestricted interest income included in Net Revenues for Fiscal Years 2016 and 2017 as follows:

TABLE 7-7				
Summary of Unrestricted Interest Income [1]				
Description	Fiscal Year Ended September 30,		Increase / (Decrease)	
	2016 [2]	2017 [3]	Amount	Percentage
Total Interest Income	\$624,985	\$550,437	(\$74,548)	(11.9%)
Springing Resolution Adjustments [4]				
Adjustment for Change in Fair Value Investment	\$11,249	\$249,987	N/A	N/A
Unrestricted Interest Income	\$636,234	\$800,424	\$164,190	25.8%
<p>[1] Represents the amount of interest income earned on applicable funds included in Net Revenues when computing Debt Service Coverage as provided by the City of Cape Coral Finance Department.</p> <p>[2] Fiscal Year 2016 derived from Footnote 13 on page 80 of the audited CAFR ending September 30<sup>th</sup>, 2016.</p> <p>[3] Fiscal Year 2017 derived from Footnote 13 on page 82 of the audited CAFR ending September 30<sup>th</sup>, 2017.</p> <p>[4] As defined in the Springing Resolution, Gross Revenues exclude market-related gains and losses that do not result in an exchange of cash. The Springing Resolution became effective once the Series 2006 Bonds were retired on or October 1, 2016. Amounts shown include adjustments for non-cash losses on investments obtained from detailed work papers provided by the City that were utilized in the development of the CAFR.</p>				

### 7.6.2.4. OPERATING REVENUES

Based on information provided by the Finance Department, the operating revenues (excluding special assessment revenues) for Fiscal Year 2017 were \$82,544,060 as shown below in **Table 7-8**. The revenues were approximately 3.6% higher than reported for Fiscal Year 2016 as shown below:

TABLE 7-8				
Summary of Operating Revenues				
Description	Fiscal Year Ended September 30,		Increase / (Decrease)	
	2016 [1]	2017 [2]	Amount	Percentage
Charges for Service	\$78,983,575	\$81,804,351	\$2,820,776	3.6%
Other Revenues	703,674	739,709	36,035	5.1%
Total Operating Revenues	\$79,687,249	\$82,544,060	\$2,856,811	3.6%
<p>[1] Fiscal Year 2016 derived from Footnote 13 on page 80 of the audited CAFR ending September 30<sup>th</sup>, 2016.</p> <p>[2] Fiscal Year 2017 derived from Footnote 13 on page 82 of the audited CAFR ending September 30<sup>th</sup>, 2017.</p>				

**7.6.3. OPERATING AND MAINTENANCE EXPENSES**

The Springing Resolution, which became effective on October 1, 2016, amends the definition of "Operating Expenses" as:

*"...the Issuer's expenses for operation, maintenance, and repairs with respect to the System and shall include, without limiting the generality of the foregoing, administration expenses, payments for the purchase of materials essential to or used in the operation of the System including bulk purchases of water or sewage services, fees for the management of the System or any portion thereof, accounting, legal and engineering expenses, ordinary and current rentals of equipment or other property, refunds of moneys lawfully due to others, payments to others for disposal of sewage or other wastes, actual payments to pension, retirement, health and hospitalization funds, and any other expenses required to be paid for or with respect to proper operation or maintenance of the System, including appropriate reserves therefor, all to the extent properly attributable to the System in accordance with generally accepted accounting principles applicable to public utility systems similar to the System, and disbursements for the expenses, liabilities and compensation of any Paying Agent or Registrar under this Resolution, but does not include any costs or expenses in respect of original construction or improvement other than expenditures necessary to prevent an interruption or continuance of an interruption*

*of service or of Gross Revenues or minor capital expenditures necessary for the proper and economical operation or maintenance of the System, or any payments in lieu of taxes or franchise fees made to the Issuer's general fund, or any accruals required to be recognized with respect to pension, retirement, health and hospitalization funds that do not require or result in the expenditure of cash, or any provision for interest, depreciation, amortization or similar charges, or any loss resulting from the valuation of investment securities, Hedge Agreements at market value and any other loss that does not require or result in the expenditure of cash."*

**Table 7-9** summarizes the System's total operating and maintenance expenses for Fiscal Year 2017, which exclude depreciation and amortization expenses. The adjustments shown in the table below reflect the impact on expenses (for the purposes of calculating debt service coverage) based on the implementation of the Springing Resolution. As shown in Table 7-9, the Operating Expenses for the year were \$45,152,483. This amount is \$3.22 million or 7.7% higher than such amounts reported for Fiscal Year 2016. After adjustments to expenses for other post-employment benefits and pension liability changes, expenses were \$8.35 million or 22.3% higher than such amount reported for Fiscal Year 2016 as shown below:

TABLE 7-9

**Summary of Operating Expenses [1]**

Description	Fiscal Year Ended September 30,		Increase / (Decrease)	
	2016 [2]	2017 [3]	Amount	Percentage
Salaries, Wages, and Employee Benefits	\$22,382,183	\$24,436,798	\$2,054,615	9.2%
Contractual Services, Materials and Supplies	19,549,038	20,715,685	1,166,647	6.0%
Sub-total Operating Expenses	\$41,931,221	\$45,152,483	\$3,221,262	7.7%
Springing Resolution Adjustments: [4]				
Other Post-Employment Benefits Obligation Change	(\$2,221,976)	(\$1,797,065)	\$424,911	(19.1%)
Net Pension Liability Change	(2,264,388)	2,440,830	4,705,218	(207.8%)
Total Springing Resolution Adjustments	(\$4,486,364)	\$643,765	\$5,130,129	(114.3%)
Total Net Operating Expenses	\$37,444,857	\$45,796,248	\$8,351,391	22.3%

[1] Operating expenses derived from the Audited CAFRs for Fiscal Years 2016 and 2017, and do not include depreciation and amortization expenses.

[2] Fiscal Year 2016 derived from Footnote 13 on page 80 of the audited CAFR ending September 30th, 2016.

[3] Fiscal Year 2017 derived from Footnote 13 on page 82 of the audited CAFR ending September 30th, 2017.

[4] As defined in the Springing Resolution, Operating Expenses exclude payments in lieu of taxes or franchise fees or any non-cash accruals with respect to pension, retirement, health and hospitalization funds, including market-related losses that do not result in an exchange of cash. For each year and category, a reduction in expense represents an increase in the unfunded liability and an increase in expense represents additional cash used to reduce the unfunded portion of the liability. The Springing Resolution became effective once the Series 2006 Bonds were retired on October 1, 2016. Information obtained from the 2016 and 2017 Comprehensive Annual Financial Reports pages 29 and 31, respectively.

#### 7.6.4.SUMMARY OF NET REVENUES AVAILABLE TO PAY DEBT AND OTHER SYSTEM NEEDS

Net Revenues, as defined in the Bond Resolution, including the Springing Resolution, are equal to Gross Revenues minus Operating Expenses. **Tables 7-7 and 7-8** summarize the amounts of income included in Gross Revenues, which is then compared to the Operating Expenses as summarized in **Table 7-9**. As shown below, **Table 7-10** summarizes the Net Revenues available to pay the Senior Lien Bonds and Junior Lien Notes Payable for Fiscal Years 2016 and 2017. Any Net Revenues available after the payment of debt service are generally used to:

- Pay for certain capital infrastructure and replacement needs of the System;
- Maintain adequate working capital / cash reserve balances;
- Fund any other lawful purposes of the System, including Transfers to the General Fund.

The following table provides a summary of the Net Revenues for Fiscal Years 2016 and 2017.

TABLE 7-10				
Summary of Net Revenues Available to Pay Debt and Other System Needs				
	Fiscal Year Ended September 30,		Increase / (Decrease)	
Description	2016	2017	Amount	Percentage
Total Operating Revenues [1]	\$79,687,249	\$82,544,060	\$2,856,811	3.6%
Unrestricted Interest Income [2]	636,234	800,424	164,190	25.8%
Total Gross Revenues	\$80,323,483	\$83,344,484	\$3,021,001	3.8%
Total Operating Expenses [3]	\$37,444,857	\$45,796,248	\$8,351,391	22.3%
Net Revenues	\$42,878,626	\$37,548,236	(\$5,330,390)	(12.4%)
[1] Operating revenues derived from <b>Table 7-8</b> and exclude Special Assessment bond activities.				
[2] Unrestricted interest income is derived from <b>Table 7-7</b> .				
[3] Operating Expenses are derived from <b>Table 7-9</b> and do not include depreciation expense.				

As shown above in **Table 7-10**, the Net Revenues for Fiscal Year 2017 were approximately \$5.3 million lower than reported for Fiscal Year 2016 or 12.4%. This decrease is primarily attributed to the increase in operating expenses as shown on **Table 7-9**, which includes increased cash payments to reduce the pension liability. The tabulation above was then used to calculate the Debt Service Coverage Ratios provided in the next section.

#### 7.6.5. DEBT SERVICE COVERAGE

**Table 7-11** provides a summary of the debt service requirements and the coverage tests as defined in the Bond Resolution and Springing

Resolution. As shown below, Test 1 compares Net Revenues plus Capital Expansion Fees to the annual principal and interest payments on the Senior Lien Bonds outstanding. Test 2 compares Net Revenues, excluding Capital Expansion Fees, to the annual amount due on all Outstanding Indebtedness, both Senior Lien and Junior Lien combined. The presentation of debt service coverage has been shown on a comparable basis under the terms of the original Bond Resolution and the revised terms under the Springing Resolution. In Fiscal Years 2016 and 2017, the debt service coverage calculations as shown below exceeded the requirements for Tests 1 and 2 as defined in the original Bond Resolution and under the revised terms of the Springing Resolution:

TABLE 7-11				
Summary of Debt Service Coverage Tests [1]				
	Fiscal Year Ended September 30,		Increase (Decrease)	
Description	2016	2017	Amount	Percentage
<b>Gross Revenues</b>				
Operating Revenues	\$79,687,249	\$82,544,060	\$2,856,811	3.6%
Unrestricted Interest Income	636,234	800,424	164,190	25.8%
Total Gross Revenues	\$80,323,483	\$83,344,484	\$3,021,001	3.8%
Operating Expenses	37,444,857	45,796,248	8,351,391	22.3%
Net Revenues Available for Debt Service	\$42,878,626	\$37,548,236	(\$5,330,390)	(12.4%)
Capital Expansion Fee Revenues Available for Debt	\$10,915,416	\$15,381,036	\$13,681,781	125.3%
Net Revenues Available for Debt Service	\$53,794,042	\$52,929,272	(\$864,770)	(1.6%)
Table continued on following page:				

TABLE 7-11

## Summary of Debt Service Coverage Tests [1]

Description	Fiscal Year Ended September 30,		Increase (Decrease)	
	2016	2017	Amount	Percentage
<b>Test 1 [2]</b>				
Net revenues and Expansion Fees adequate at all times to pay at least 120% (1.20 Coverage Factor) of the Annual Debt Service on all Outstanding Bonds becoming due in such fiscal year.				
Net Revenues and Expansion Fees	\$53,794,042	\$52,929,272	(\$864,770)	(1.6%)
Annual Debt Service (Senior Lien) [3]	\$28,844,647	\$28,848,604	\$3,957	0.0%
Calculated Compliance Coverage Ratio	<b>1.86</b>	<b>1.83</b>		
Coverage as Calculated in the CAFR [4]	<b>1.71</b>	<b>1.85</b>		
Required Coverage Ratio	<b>1.20</b>	<b>1.20</b>		
<b>Test 2 [2]</b>				
Net Revenues adequate to pay at least 100% of (a) the Annual Debt Service on all Outstanding Bonds becoming due in such fiscal year; and (b) any payments of Subordinated Debt which must be made during such fiscal year from the Net Revenues.				
Net Revenues	\$42,878,626	\$37,548,236	(\$5,330,390)	(12.4%)
Annual Debt Service (Senior Lien and Junior Lien) [3]	\$29,260,327	\$29,901,175	\$640,848	2.2%
Calculated Compliance Coverage Ratio	<b>1.47</b>	<b>1.26</b>		
Coverage as Calculated in the CAFR [4]	<b>1.33</b>	<b>1.32</b>		
Required Coverage Ratio	<b>1.00</b>	<b>1.00</b>		
<b>Amount Available After Payment of Senior and Junior Lien Debt</b>				
Net Revenues and Expansion Fees	\$53,794,042	\$52,929,272	(\$864,770)	(1.6%)
Less Annual Debt Service (Senior Lien) [3]	28,844,647	28,848,604	3,957	0.0%
Amount Available for Subordinate Debt Service Payments	\$24,949,395	\$24,080,668	(\$868,727)	(3.5%)
Annual Debt Service (Junior Lien) [3]	\$415,680	\$1,052,571	\$636,891	153.2%
Calculated Coverage Ratio	<b>60.02</b>	<b>22.88</b>		
Net Amount Available for Other Lawful Purposes	\$24,533,715	\$23,028,097	(\$1,505,618)	(6.1%)
[1] Annual Debt Service provided by the City Finance Department. Calculations shown are based on the revised definitions included as a part of the Springing Resolution, which became effective when the Series 2006 Bonds were fully retired on October 1, 2016.				
[2] As defined in the adopted Bond Resolution, including the Springing Resolution.				
[3] Amounts derived from the Annual Debt and Credit Reports and Official Statements as provided by the City. For loans WW360100 and DW360103 only the non-assessment portion of the annual debt service payments, as provided by the City, were included.				
[4] Coverages shown based on the composite Bond Resolution only, excluding the Springing Resolution adjustments, as calculated by City staff, which were obtained from pages 82 and 80 of the 2017 and 2016 CAFRs, respectively.				

As shown above, the City exceeded the minimum debt service coverage requirements specified for Tests 1 and 2 as required by the Bond Resolution, including the Springing Resolution.

## 7.6.6. RENEWAL AND REPLACEMENT

The Bond Resolution defines the "Renewal and Replacement Fund" as:

*"There shall be deposited to the Renewal and Replacement Fund such sums as shall be sufficient to pay one twelfth (1/12) of five percent (5%) of the Gross Revenues derived from the System during the preceding Fiscal Year until the amount accumulated in such Fund is equal to the Renewal and Replacement Fund Requirement."*

Based on the Gross Revenues for preceding Fiscal Year (FY 2016) as shown in Table 7-11 or \$80.3 million, the required minimum balance of the Renewal and Replacement Fund is approximately \$4.0 million. As provided in the City's Audited CAFR, the balance of the Renewal and Replacement Fund was \$5,990,833 as of September 30, 2017. This amount is sufficient to meet the covenant requirement defined in the Bond Resolution for Fiscal Year 2017. Based on the Gross Revenues for Fiscal Year 2017 or \$83.1 million, the minimum required balance in the Renewal and Replacement Fund for Fiscal Year 2018 is approximately \$4.2 million. Therefore, no additional deposits are required for the Renewal and Replacement Fund.

## 7.7 BOOKS AND RECORDS

The City maintains books, records and accounts of the revenues and operations of the water and sewer systems, which are separate and apart from all other books, records, and accounts of the City. This procedure is in compliance with Section 5.05 of the Bond Resolution.

## 7.8 ANNUAL AUDIT

The City is required, immediately after the close of each Fiscal Year, to cause the books, records, and accounts relating to the Utility System to be properly audited by a recognized independent firm of Certified Public Accounts ("CPAs") and shall require such accountants to complete their report of such annual audit in accordance with applicable law.

The City hired Clifton Larson Allen as their independent auditors in Fiscal Year 2017. Clifton Larson Allen issued an unmodified opinion on the City's financial statements for Fiscal Year 2017.

## 7.9 INSURANCE

The Bond Resolution requires, including the Springing Resolution, requires:

*"SECTION 5.08 INSURANCE: The Issuer will carry such insurance as is ordinarily carried by private or public entities owning and operating utilities similar to the System with a reputable insurance carrier or carriers, in such amounts as the Issuer shall determine to be sufficient and such other insurance against loss or damage by fire, 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 or 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, shall recommend or approve as sufficient."*

*The Issuer may establish certain levels of insurance for which the Issuer may self-insure. Such levels of insurance shall be in amounts as recommended 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 proceeds from property loss and casualty insurance shall be deposited in the Renewal and Replacement Fund and, together with other available funds of the Issuer, shall be used to repair or replace the damaged portion of the System; provided, however, 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 \$500,000, (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 Outstanding Bonds for purposes of federal income taxation (other than Taxable Bonds) and will not otherwise affect the status of any Outstanding Bonds issued as Federal Subsidy Bonds or the Issuer's receipt of Federal Subsidy Payments with respect to any Outstanding Federal Subsidy Bonds, or (2) if such proceeds are less than \$500,000, be deposited in the Revenue Fund"*

The City employs a full-time manager who oversees the City's loss prevention programs. The City's management is of the opinion that the City has sufficient insurance to indemnify the City against reasonably foreseeable losses.

The insured values of the water and sewer systems are updated each year to reflect the replacement costs as determined by an actuary. **Tables 7-12** and **7-13** show the insurance policies in place and the insured values of the System.

TABLE 7-12			
Schedule of Insurance Policies in Force [1]			
Insurer	Risk	Coverage Amount	Expiration Date
Florida Municipal Ins. Trust	Property (Non-Utility)	\$141,525,887 Real Property / \$11,590,484 Personal Property	10/1/2017
Various Reinsurers	Property (Utility)	\$150,000,000	10/1/2017
Florida Municipal Ins. Trust	Boiler and Machinery	\$50,000,000	10/1/2017
Florida Municipal Ins. Trust	Auto Liability and Physical Damage	\$3,000,000	10/1/2017
Florida Municipal Ins. Trust	General Liability	\$3,000,000	10/1/2017
Florida Municipal Ins. Trust	Crime Policy	\$10,000-\$500,000 Depending on Coverage	10/1/2017
Florida Municipal Ins. Trust	Law Enforcement Liability	\$3,000,000	10/1/2017
Florida Municipal Ins. Trust	Public Officials Liability	\$3,000,000	10/1/2017
Florida Municipal Ins. Trust	Workers' Compensation	Statutory	10/1/2017
Florida Municipal Ins. Trust	Employer's Liability by Accident / Disease	\$1,000,000	10/1/2017
Indian Harbor Ins. Co.	Environmental (Pollution Liability)	\$1,000,000	10/1/2017
Mount Vernon Fire Ins. Co.	Liquor Law Liability – Coral Oaks Golf Club	\$1,000,000 per Occurrence / \$2,000,000 Aggregate	10/1/2017
Continental Ins. Co.	Hull – Watercraft	\$584,000	10/1/2017
National Fire and Marine Ins. Co.	Special Events – Tenant User Liability Insurance	\$1,000,000 per Occurrence / \$2,000,000 Aggregate	10/1/2017
Hartford Life and Accident Ins. Co.	Statutory Accidental Death and Dismemberment	\$66,041.74 in Line of Duty, Fresh Pursuit / \$198,669.21 Unlawful and Intentional Death	10/1/2017
Wright National Flood Ins. Co.	Flood Insurance	Various	10/1/2017
[*] Furnished by the City of Cape Coral Risk Management Department. Policies were renewed upon expiration.			

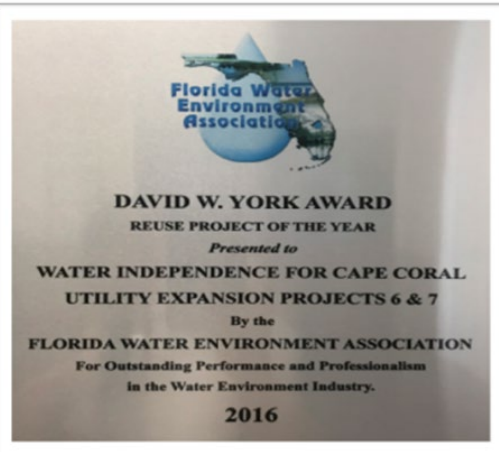
TABLE 7-13	
Insured Values of the Water and Sewer Systems [*]	
Department	Total Value
Water and Wastewater System Assets	\$150,000,000
Total	\$150,000,000
[*] Information furnished by the City of Cape Coral Risk Management Department.	



**REGION V  
FSAWWA  
WINNER**

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**BEST TASTING  
DRINKING WATER  
2017**



# FY 2017 UTILITIES ANNUAL REPORT



AECOM prepared an Annual Report, which addressed the operations, maintenance and condition of the City's Utility System in accordance with Section 5.18 of the City of Cape Coral, Florida, Water and Sewer Refunding Revenue Bonds, Series 2015. The purpose of this is quoted below:

*“The Issuer shall employ Consulting Engineers, whose duties shall be to make any certificates and perform any other acts required or permitted of the Consulting Engineers under this Resolution, and also review the construction and operation of the System, to make an inspection of the System .... to submit to the Issuer a report with recommendations as to the proper maintenance, repair and operation of the System, including recommendations for expansion and additions to the System to meet anticipated service demands, and an estimate of the amount of money for such purposes...”*



# Scope of Services

Complete review of operation, maintenance, and repair of the Utility system to understand system condition and ability to meet current and projected regulatory requirements and needs

Complete financial review

Prepare annual report

Prepare presentation



AECOM assessed that the Utilities Department:

- ✓ Provides excellent reliable service to its customers.
- ✓ Regularly evaluates current and future system needs and develops plans and strategies to implement needed infrastructure improvements,
- ✓ Department and staff operate on a daily basis with the objective of meeting the mission statement below:

*“Continue to improve our delivery of cost-effective water, irrigation water and wastewater collection services by empowering employees to responsively meet customer expectations for quality, value, safety, reliability and environmental responsibility”*



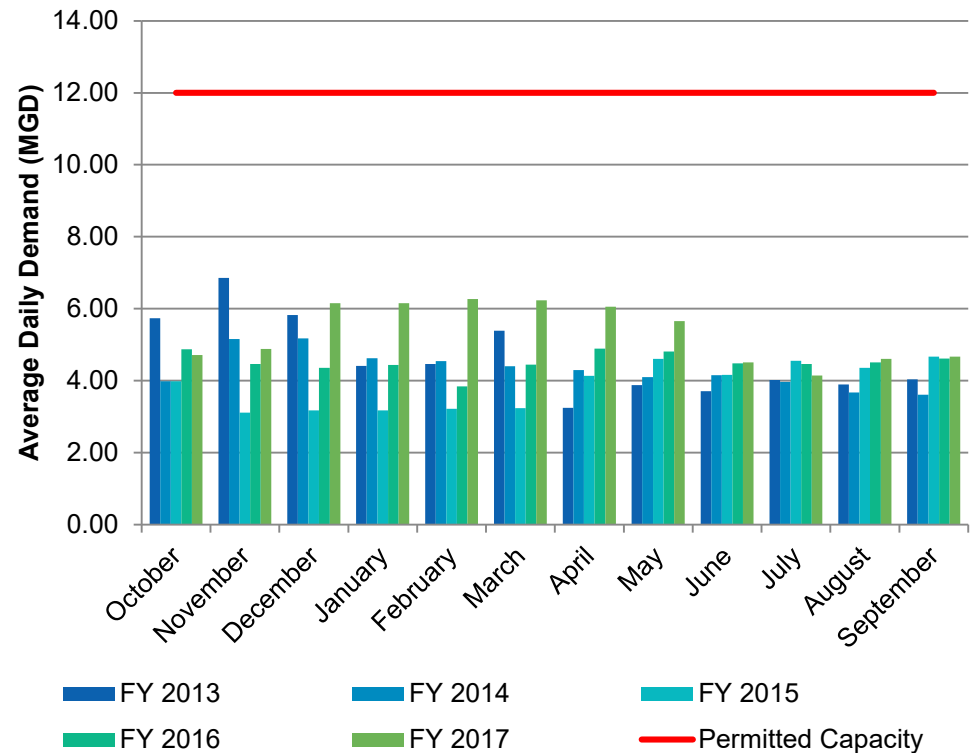


- ✓ 55 RO supply wells are in good condition. Raw water supply is adequate at this time.
- ✓ Continue with Hydrogeologic Model to determine future improvements that may be needed to address wells with decreasing water quality and future buildout demands.
- ✓ 28 miles of raw water mains are maintained in good physical condition.
- ✓ Ongoing regular maintenance and upgrade programs should continue.

## North RO WTP

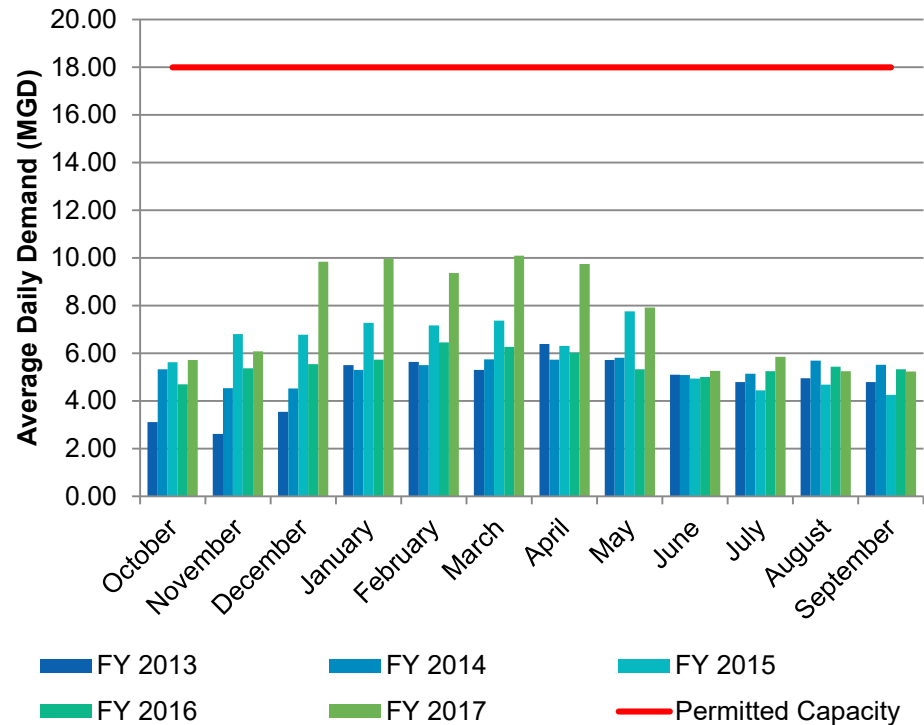
Permitted capacity at North RO Plant is 12 MGD

REGION V FSAWWA  
Winner of Best Tasting  
Drinking Water 2017



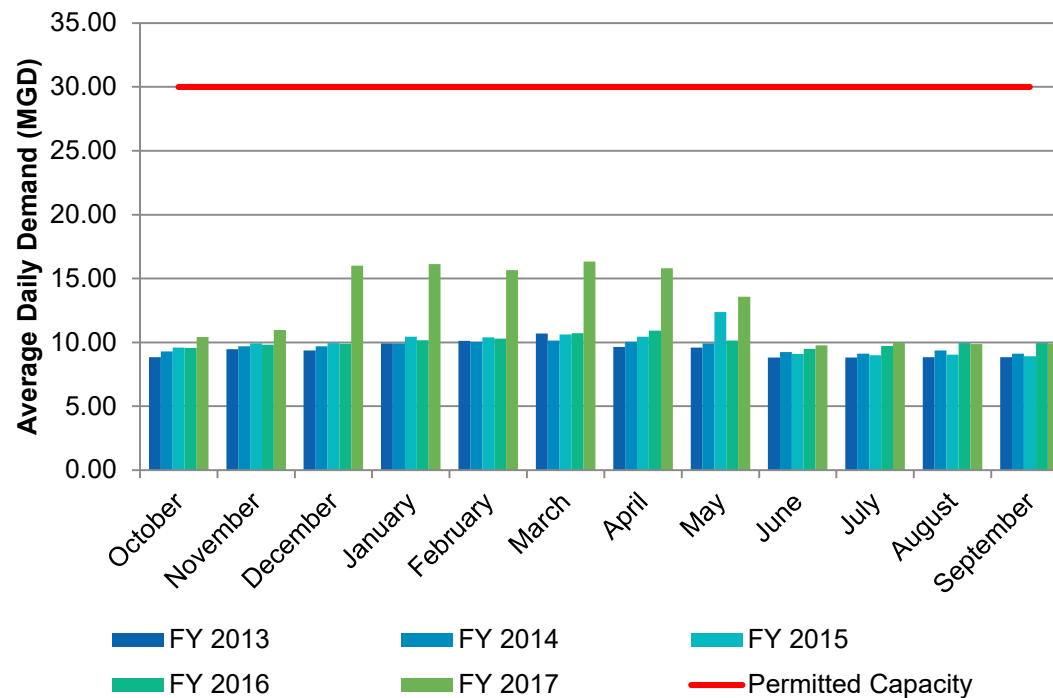
## Southwest RO WTP

Permitted capacity at  
Southwest RO Plant is  
18.1 MGD



Combined Capacity of Both Plants will meet future demands associated with current Utility Expansion Program

Combined monthly average daily flow (ADF) for FY 2017 ranged from 9.8 MGD in June 2017 to 16.33 MGD in March 2017



- ✓ City's unaccounted-for loss of potable water is 5% considerably less than the 10% requirement.
- ✓ Major process equipment and general operating conditions are in good working order
- ✓ Maintenance staff consists of licensed electricians and mechanics
- ✓ Maintenance Schedules established.
- ✓ Provided continuous potable water service to customer's during Hurricane Irma.
- ✓ Annual cleaning of RO membranes prolongs life of membranes
- ✓ Plants have consistently met or exceeded the FDEP minimum standards for finished water quality.



Water storage and pumping facilities are in good operating condition

	Palm Tree Pumping Station	Van Loon Storage & Booster Pump Station
Finished Water Storage:		
Type	Concrete Ground Storage Tank	Concrete Ground Storage Tank
Number of Tanks	1	1
Capacity of Tanks	2 MG	1 MG
High Service Pumps:		
Number of Pumps	4	2
Capacity of Pumps	(Units 1,2,3, &4) 1,500 GPM	(Each) 1,000 GPM
Total Capacity	6,000 GPM	2,000 GPM

## Potable Water Mains

Good operating condition

Continue Programs implemented to maintain system reliability and improve customer service:

- Galvanized Pipe Replacement Program
- Leak Detection Program
- Meter Change out Program



## Gravity Sewers

734 miles of gravity sewer & 11,659 sewer manholes are in good physical condition

Recommend continuing City Program for gravity sewer pipe televising (TV) and sealing program



## Forcemains

203 miles of force main

System in good operating condition

Continue ongoing program to check sections of force mains for leaks and other potential problems

## Wastewater Lift Stations

300 wastewater lift stations

610 pumps in these lift stations

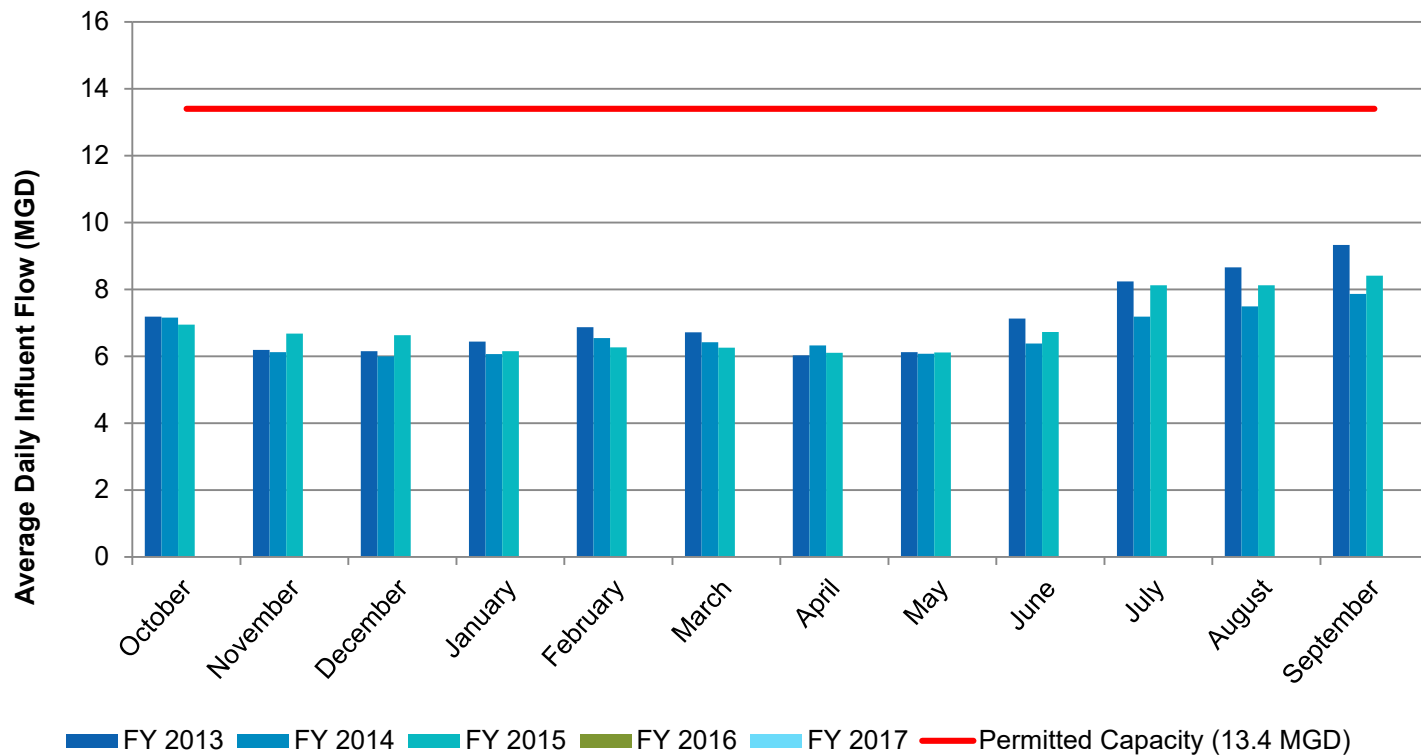
Good operating condition

Continue ongoing pro-active rehabilitation program:

- Concrete/leak repair
- Coating of wetwell
- Replace discharge piping and check valves
- Reduce infiltration

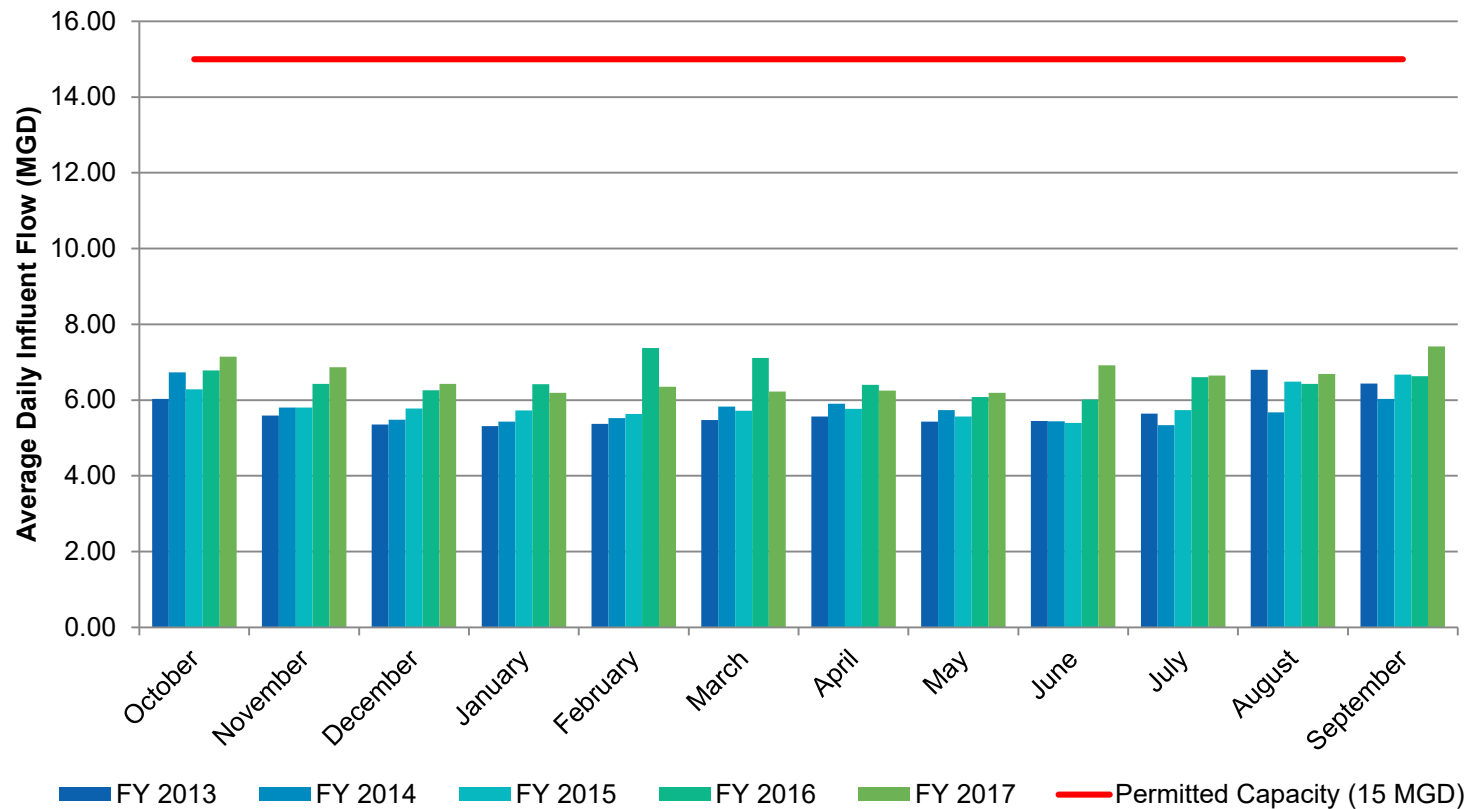
## Everest WRF

Influent flow well below permitted capacity of 13.4 MGD.



## Southwest WRF

Influent flow well below permitted capacity of 15.0 MGD.



Combined Capacities will meet future wastewater flows associated with current Utility Expansion Program

Both WRFs consistently meet operating permit requirements

Equipment and general operating conditions are in good condition

Maintenance schedules have been established

Both WRFs remained in full operation during two unprecedented rain events, a 200 year event in August and Hurricane Irma in September.



Inventory of spare parts for major equipment maintained

Contracts in place for refurbishment/replacement of large equipment such as motors or pumps

Capital Project implemented to improve biosolids handling using centrifuges at SW WRF to improve dewatering and reduce hauling costs to Lee County Solid Waste facility



## Canal Water Supply

Fresh water canals primary source of IQ water

Five canal pump stations have combined capacity of 85.2 MGD to meet future demands for irrigation and fire protection

Pump stations well maintained and in good condition

Weir improvement projects completed and underway in northern part of the City to capture more water for irrigation use and for level maintenance of the fresh water canal system

Recommended that City continue with weir improvement projects and as well as other considerations to assist in maximizing system storage.



## Reclaimed Water Supply

Effluent from Everest WRF and Southwest WRF secondary sources of supply for IQ water system.

- (2) 5-million gallon storage tanks & (6) 300 hp reuse pumps at Everest WRF
- (3) 5-million gallon storage tanks & (8) 250 hp reuse pumps at SW WRF



### Reclaimed Water Supply

City achieved one hundred percent (100%) of plant effluent for IQ water supply

Reclaimed water supply system is in good operating condition

Continue regular maintenance

Alternatives are being evaluated to increase irrigation availability to meet future demands.



## Irrigation Quality Water Availability

Pursuing alternatives to increase irrigation availability and reduce demands on canal system:

1. Construction of new canal pump station/pipeline to support North 2 UEP.
2. Installation of test ASR well to investigate storage potential.
3. Pilot pump test to evaluate feasibility of SW Aggregate Mine for surface water supply
4. Evaluating construction of Interconnect Pipeline from City of Fort Myers to Cape Coral for conveyance of excess reuse water.
5. Constructing Pipeline to convey reclaimed water from FGUA to City.
6. Removal of fire suppression from irrigation system.

## Irrigation Quality Water Distribution System

790 miles of distribution mains (ranging in size from 2-42 inches)

65,674 service connections & 863 IQ water system fire hydrants

IQ system in good condition



- ✓ Five-year major Capital Improvements Program updated and calibrated yearly.
- ✓ Major Capital Upgrades made to the Water and Wastewater Infrastructure in FY 2017 include:
  - ❑ Membranes replaced at SW RO WTP. Estimated \$126,895 recurring annual cost avoidance.
  - ❑ Selected Vendor and finalized contract for Hydrogeologic Modeling.
  - ❑ Construction of the Southwest RO Warehouse.
  - ❑ Completed Southwest RO Structural Improvements.
  - ❑ Rehabilitated 62 Manholes
  - ❑ Completed installation of Biosolids Centrifuge.
  - ❑ Completed Basin 365 Pipe Lining
- ✓ Department is identifying major expansions/system improvements in advance to ensure water, wastewater and reclaimed water facilities continue to provide reliable, high quality water and wastewater service for existing and future customers

Annual Report finds that potable water, wastewater and irrigation quality water systems have been maintained in good condition and are operated in an efficient manner at a reasonable cost as noted below:

- ✓ City is able to meet operations and maintenance obligations through its established rates, and produce required net revenues, expansion fees and special assessment proceeds.
- ✓ The disposition of revenues is in accordance with all bond covenants. funds.
- ✓ The City has exceeded the minimum debt service coverage requirements as required by Bond Resolution.
- ✓ The facilities insurance requirements are adequate.

**QUESTIONS/COMMENTS?**