Board of Commissioners Work Session

PUBLIC UTILITIES

JOHNSTON COUNTY
NORTH • CAROLINA

February 18, 2021

Water Services: Overview

- Approx. 40,800 retail customers
- Bulk service - entire towns:

Clayton	Four Oaks
Princeton	Kenly

- Bulk service - portions of towns:

Smithfield	Micro
Pine Level	Benson
Fuquay-Varina	Selma

- Bulk service to two (2) private utilities
- Operate and maintain:
  - 12.0 (almost 14) MGD WTP
  - 25 booster pump stations
  - 11 elevated tanks
  - 1,750 miles of 2" – 24" pipelines

Water Services: Current Supply

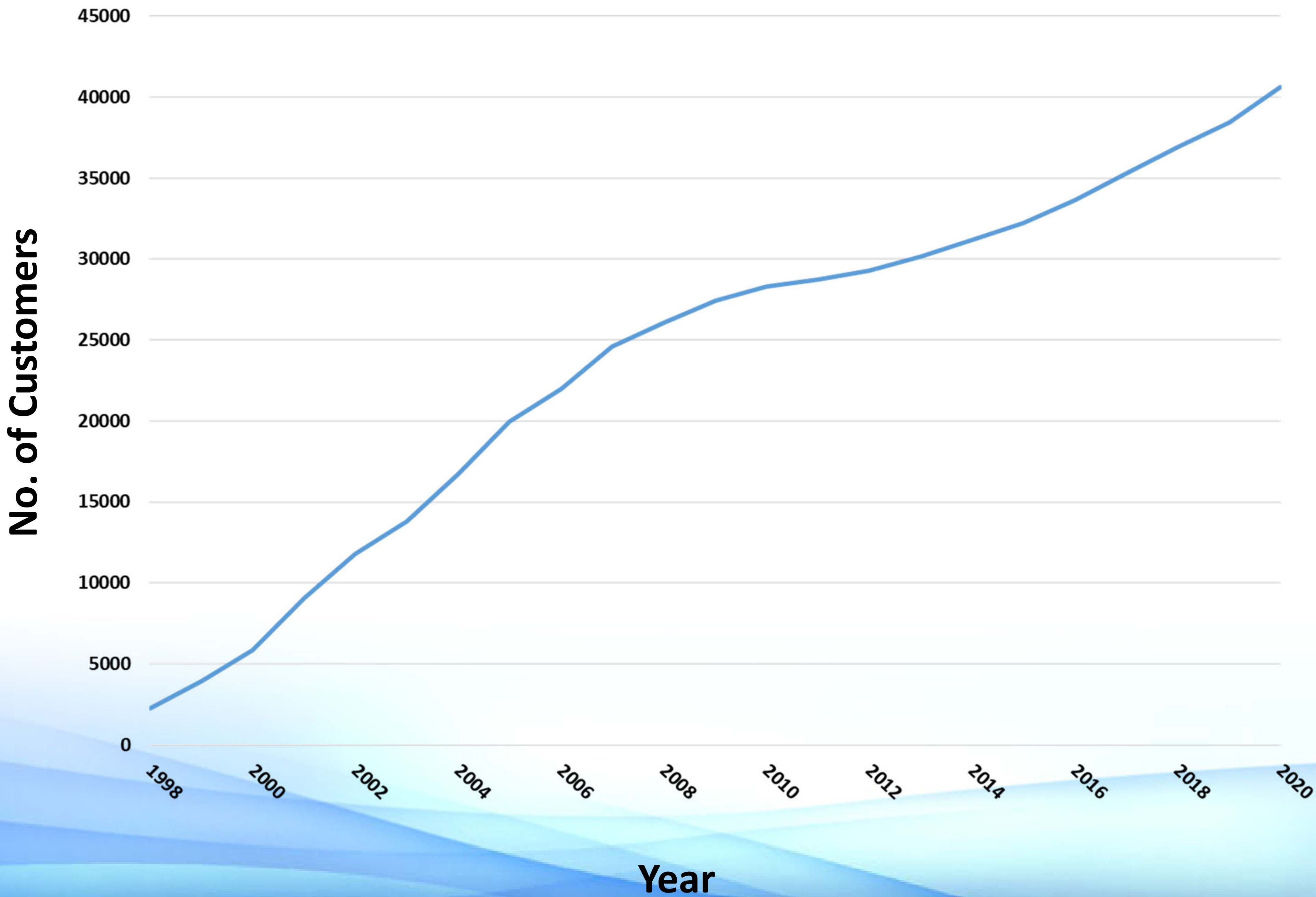
	Capacity (MGD)
Timothy G. Broome WTP – Neuse River at Wilson's Mills	**14.0**
Purchase Agreements:	
Town of Smithfield*	**3.0**
Harnett County	**2.5**
City of Wilson	**1.5**
Wayne Sanitary Districts	**0.45**
Sampson County	**0.15**
Sampson County (Summer 2021)	**0.35**
Total	**21.95**
Emergency Contracts	
City of Raleigh	**2.15**

*Additional 0.5 MGD available for use from Town of Smithfield (non-purchased capacity)

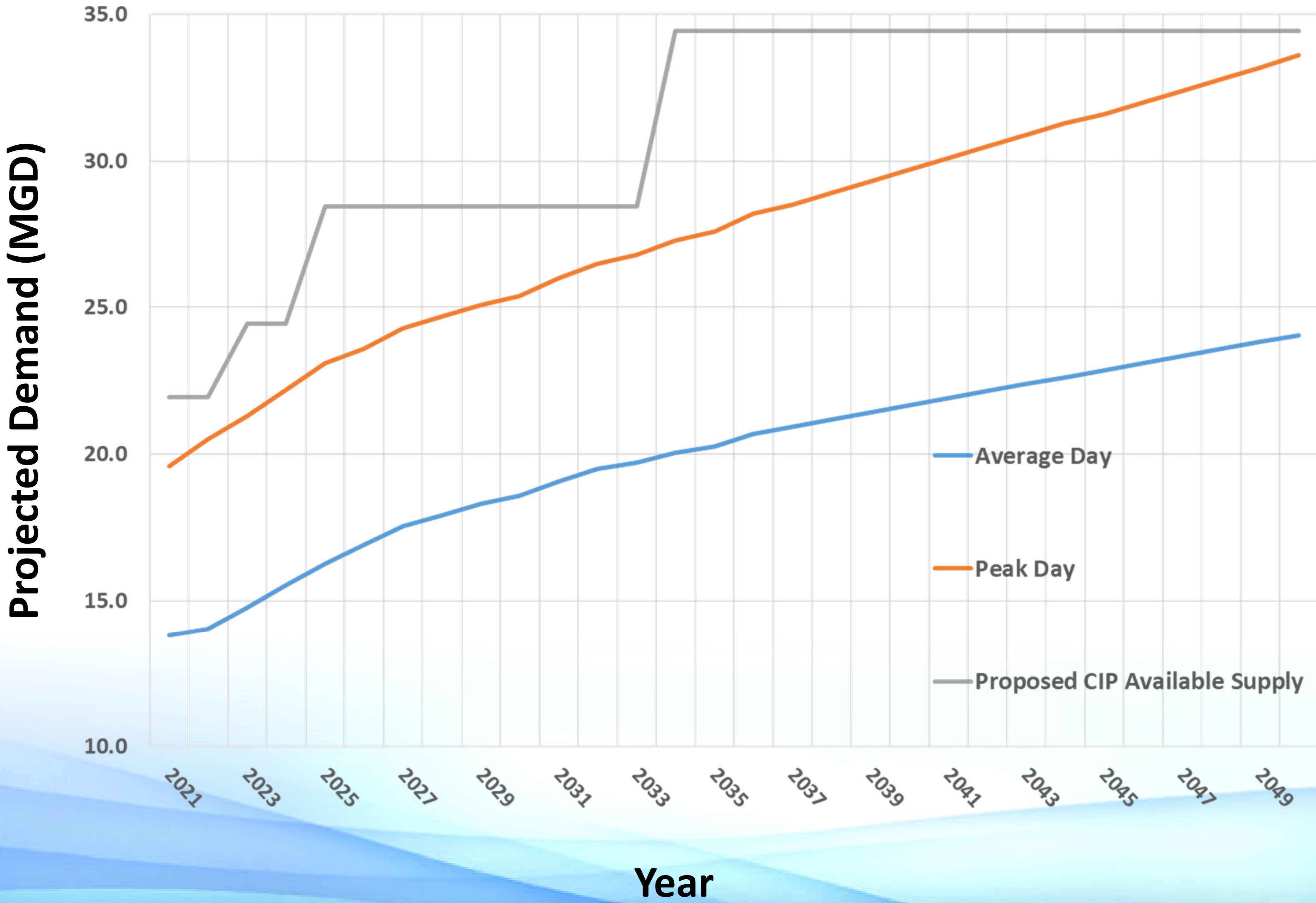
Water Services: Growth

	2017	2018	2019	2020
Total Retail Customers	35,293	36,942	38,458	40,603
No. of New Retail Customers	1,620	1,649	1,516	2,145
Yearly Retail Customer Growth (%)	4.8	4.7	4.1	5.6
Average Day Demand (MGD)	12.43	13.10	13.69	13.57
Peak Day Demand (MGD)	14.73	15.99	17.02	16.63

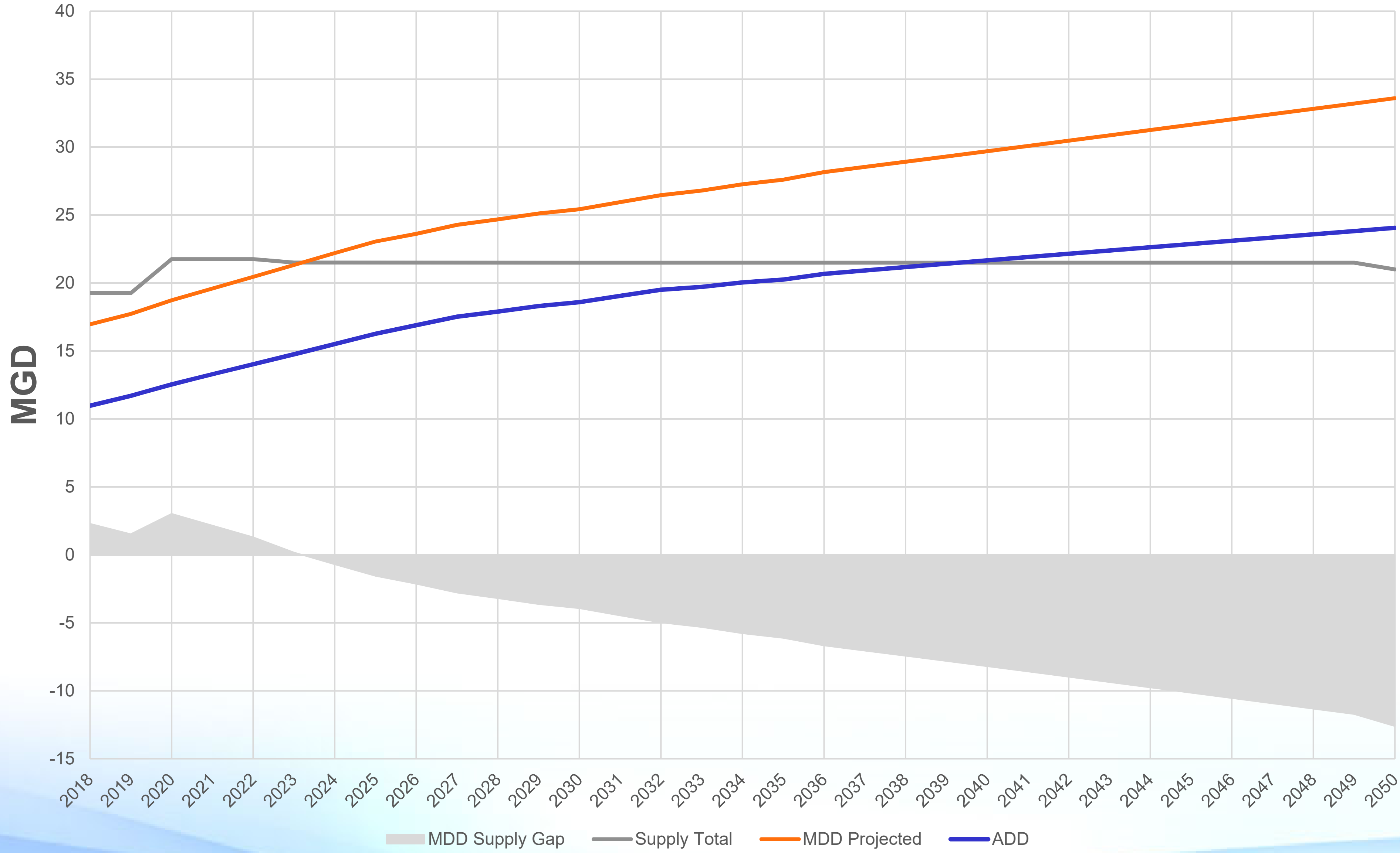
Water Services: Historical Retail Customer Growth



Water Services: Proposed 30 Year Demand/Supply



Water Services: 30 Year Supply Gap Progression



***Graph prepared by Hazen & Sawyer as part of Johnston County's Long Term Water Supply Planning Study**

Water Services: Supply Planning

- Additional 4.0 Supply at existing TGB WTP
- Potential Near-Term Purchase Supply Contracts:
  - City of Wilson (0.5 MGD without IBT)
  - City of Raleigh
  - Harnett County – Cape Fear
  - City of Dunn – Cape Fear
  - Sampson County
- Long-Term
  - Lower Neuse Intake/Quarry Storage
  - Off-stream Reservoir near TGB WTP
  - City of Wilson – Buckhorn Reservoir
  - Other (additional Neuse withdrawal, etc.)

Water Services: 20 Yr. CIP (Fund 67)

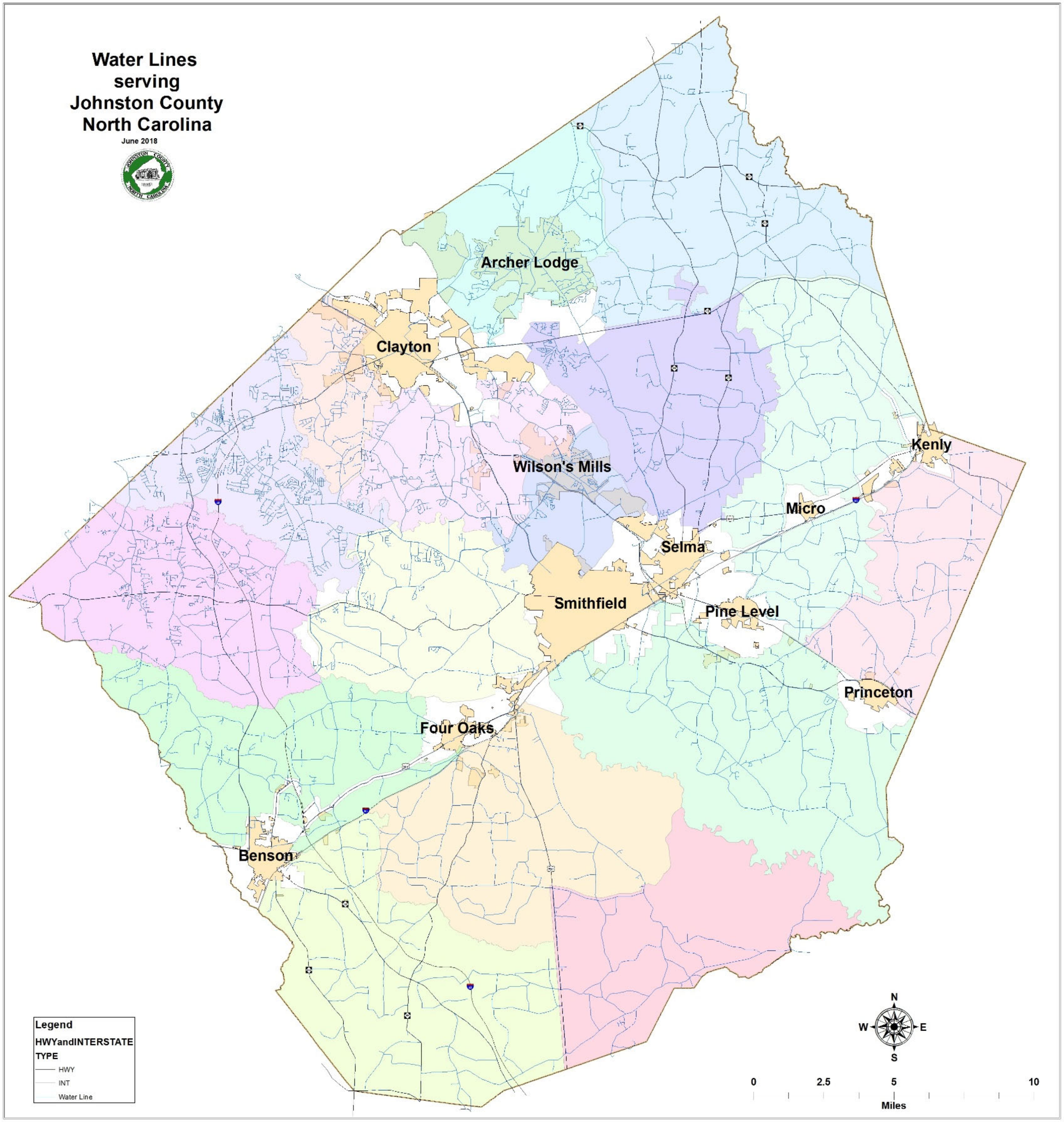
	Capital Project	2021-2025	2026-2030	2031-2035	2036-2041	TOTAL
1	WTP Efficiency Project (WIF 1948)	$ 6,524,400	$ -	$ -	$ -	$ 6,524,400
2	New 1200 KW Generator with ATS	$ -	$ 700,000	$ -	$ -	$ 700,000
3	Purchase Water Supply	$ 5,000,000	$ -	$ -	$ -	$ 5,000,000
4	Additional 4 MGD WTP Capacity and New Electrical Service (18 MGD)	$ 30,000,000	$ -	$ -	$ -	$ 30,000,000
5	New Raw Water Source, Storage and Transmission (12-14 MGD Capacity)	$ -	$ -	$ 50,000,000	$ -	$ 50,000,000
6	Additional 6 MGD WTP Capacity (24 MGD)	$ -	$ -	$ 75,000,000	$ -	$ 75,000,000
7	Building Expansions for Maintenance Div. (1/2 cost)	$ 75,000	$ -	$ -	$ -	$ 75,000
8	Replace Heavy Maintenance Equipment (1/2 Cost)	$ 75,000	$ 75,000	$ 75,000	$ -	$ 225,000
9	Asset Management Program (1/2 Cost)	$ 83,000	$ 20,000	$ 91,000	$ 24,000	$ 218,000
10	New Customer Service Center (1/2 Cost)	$ 150,000	$ -	$ -	$ -	$ 150,000
11	Upgrade Meter Reading Hardware (1/2 Cost)	$ 100,000	$ -	$ -	$ -	$ 100,000
12	Leak Detection Program	$ 150,000	$ -	$ -	$ -	$ 150,000
13	SCADA Upgrades	$ -	$ 1,000,000	$ -	$ 2,500,000	$ 3,500,000
14	WTP Security Upgrades	$ 1,000,000	$ -	$ 500,000	$ -	$ 1,500,000
15	Rehab Existing Filters (2, 3 &4)	$ 120,000	$ -	$ 450,000	$ -	$ 570,000
16	Replace Shark Scraper in Holding Pond	$ -	$ 750,000	$ -	$ -	$ 750,000
	TOTAL	**$ 43,277,400**	**$ 2,545,000**	**$ 126,116,000**	**$ 2,524,000**	**$ 174,462,400**

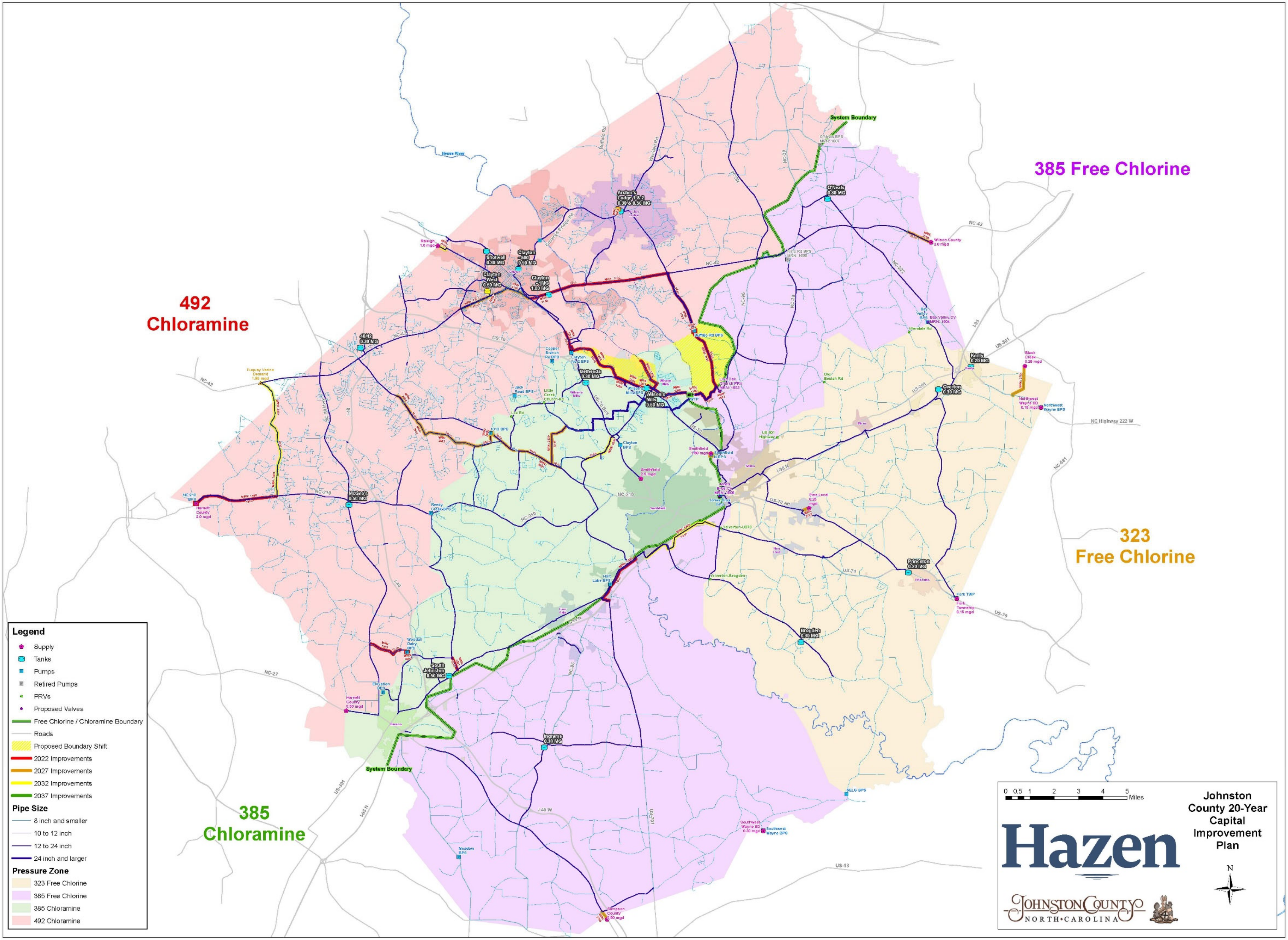
Fund 67 Total 20 Year CIP = $174,462,400

Water Services: 20 Yr. CIP (Fund 69)

	Capital Project	2021-2025	2026-2030	2031-2035	2036-2041	TOTAL
1	Buffalo Rd: Buffalo Rd - NC 42 &BPS Upgrade	$ 10,400,000	$ -	$ -	$ -	$ 10,400,000
2	NC 42: Buffalo Rd - Glen Laurel Rd - w/ NCDOT	$ 3,000,000	$ -	$ -	$ -	$ 3,000,000
3	Neuse River Crossing on NC 42	$ 1,200,000	$ -	$ -	$ -	$ 1,200,000
4	NC 42: Glen Laurel Rd through Town to US 70 BUS	$ -	$ 2,500,000	$ -	$ -	$ 2,500,000
5	385 Hydraulic Improvements	$ 5,200,000	$ -	$ -	$ -	$ 5,200,000
6	ALWD 500,000 Gal Tank (H-SRP-D-17-0125)	$ 2,000,000	$ -	$ -	$ -	$ 2,000,000
7	ITWD 2018-19 Hyd. Improve (H-SRP-D-17-0133)	$ 3,009,000	$ -	$ -	$ -	$ 3,009,000
8	NC 210 Hwy: County line - NC 50(H-SRP-D-17-0138)	$ 5,888,170	$ -	$ -	$ -	$ 5,888,170
9	Live Oak Church Rd/Bay Valley PRVs	$ 300,000	$ -	$ -	$ -	$ 300,000
10	Princeton Waterline Improvements	$ 500,000	$ -	$ -	$ -	$ 500,000
11	NC 42: US 70 Bus Hwy - Amelia Church Rd - NCDOT	$ -	$ 1,506,800	$ -	$ -	$ 1,506,800
12	Wellons Rd: Little Creek Church Rd - Cleveland Rd	$ -	$ 1,318,500	$ -	$ -	$ 1,318,500
13	Deer Cr Ln/Clev/Short Journey/Matthews/Polenta	$ -	$ 8,380,700	$ -	$ -	$ 8,380,700
14	Cleveland Rd: Matthews Rd - Cornwallis Rd	$ -	$ 1,425,300	$ -	$ -	$ 1,425,300
15	1010, Smithfield North & WM BPS Upgrade	$ -	$ 1,117,400	$ -	$ 235,000	$ 1,352,400
16	Wilson County Pipe Upgrade	$ -	$ 1,121,800	$ -	$ -	$ 1,121,800
17	I-95: US 70 Bus - near 931 Whitley Farm Rd	$ -	$ -	$ 2,434,100	$ -	$ 2,434,100
18	White Mem Church Rd: NC 210 Hwy - Jackson-King	$ 2,139,000	$ -	$ -	$ -	$ 2,139,000
19	Jackson-King Rd: White Mem Church Rd - NC 50	$ -	$ -	$ 2,026,100	$ -	$ 2,026,100
20	Swift Creek Rd: US 70 Bus Hwy - Short Journey Rd	$ -	$ -	$ 1,062,200	$ -	$ 1,062,200
21	Clayton West Tank (0.5 MG)	$ -	$ -	$ 1,700,000	$ -	$ 1,700,000
22	Hydraulic Improvements/Looping Lines	$ 250,000	$ 500,000	$ 500,000	$ 500,000	$ 1,750,000
23	Replace AC water mains	$ 2,808,000	$ -	$ -	$ -	$ 2,808,000
24	Replace 12" SDR21 PVC mains in System	$ 2,000,000	$ 5,000,000	$ 5,000,000	$ 6,000,000	$ 18,000,000
25	BPS Rebuild	$ -	$ -	$ 140,000	$ 210,000	$ 350,000
26	Master Meter Upgrades	$ 50,000	$ -	$ 50,000	$ 50,000	$ 150,000
27	Smart Meter Replacement	$ 3,000,000	$ 1,000,000	$ -	$ -	$ 4,000,000
28	Add Generator and BPSs in system (11)	$ 80,000	$ 285,000	$ -	$ -	$ 365,000
29	SCADA and Security Upgrades	$ 3,500,000	$ -	$ -	$ -	$ 3,500,000
	TOTAL	**$ 45,324,170**	**$ 24,155,500**	**$ 12,912,400**	**$ 6,995,000**	**$ 89,387,070**

Fund 69 Total 20 Year CIP = $89,387,070


Water Lines
serving
Johnston County
North Carolina
June 2018
Archer Lodge
Clayton
Wilson's Mills
Kenly
Micro
Selma
Smithfield
Pine Level
Princeton
Four Oaks
Benson
Legend
HWYandINTERSTATE
TYPE
HWY
INT
Water Line
N
W
E
S
0
2.5
5
10
Miles


385 Free Chlorine
492 Chloramine
323 Free Chlorine
385 Chloramine
System Boundary
Legend
Supply
Tanks
Pumps
Retired Pumps
PRVs
Proposed Valves
Free Chlorine / Chloramine Boundary
Roads
Proposed Boundary Shift
2022 Improvements
2027 Improvements
2032 Improvements
2037 Improvements
Pipe Size
8 inch and smaller
10 to 12 inch
12 to 24 inch
24 inch and larger
Pressure Zone
323 Free Chlorine
385 Free Chlorine
385 Chloramine
492 Chloramine
0 0.5 1 2 3 4 5 Miles
Hazen
Johnston County 20-Year Capital Improvement Plan
JOHNSTON COUNTY
NORTH CAROLINA
N

Water Services: Challenges

- Secure additional purchase supplies for near-term peak days
- Best option for long-term supply
- Maintain excess treatment and transmission capacity
  - Critical for economic development
- Complete necessary transmission improvements to meet growing demands
- Complete improvements in low-pressure areas (fire flow) – funding?
- **Demand projections from towns/bulk customers**
- Maintain reasonable user rates, SDFs (system development fees) and bulk capacity fees, but sustainable to support growing system demands

Wastewater Services: Overview

- Approx. 8,000 retail customers (mostly in Cleveland and McGee's Crossroads areas)
- Retail customer growth approx. 13% per year
- Bulk Service:

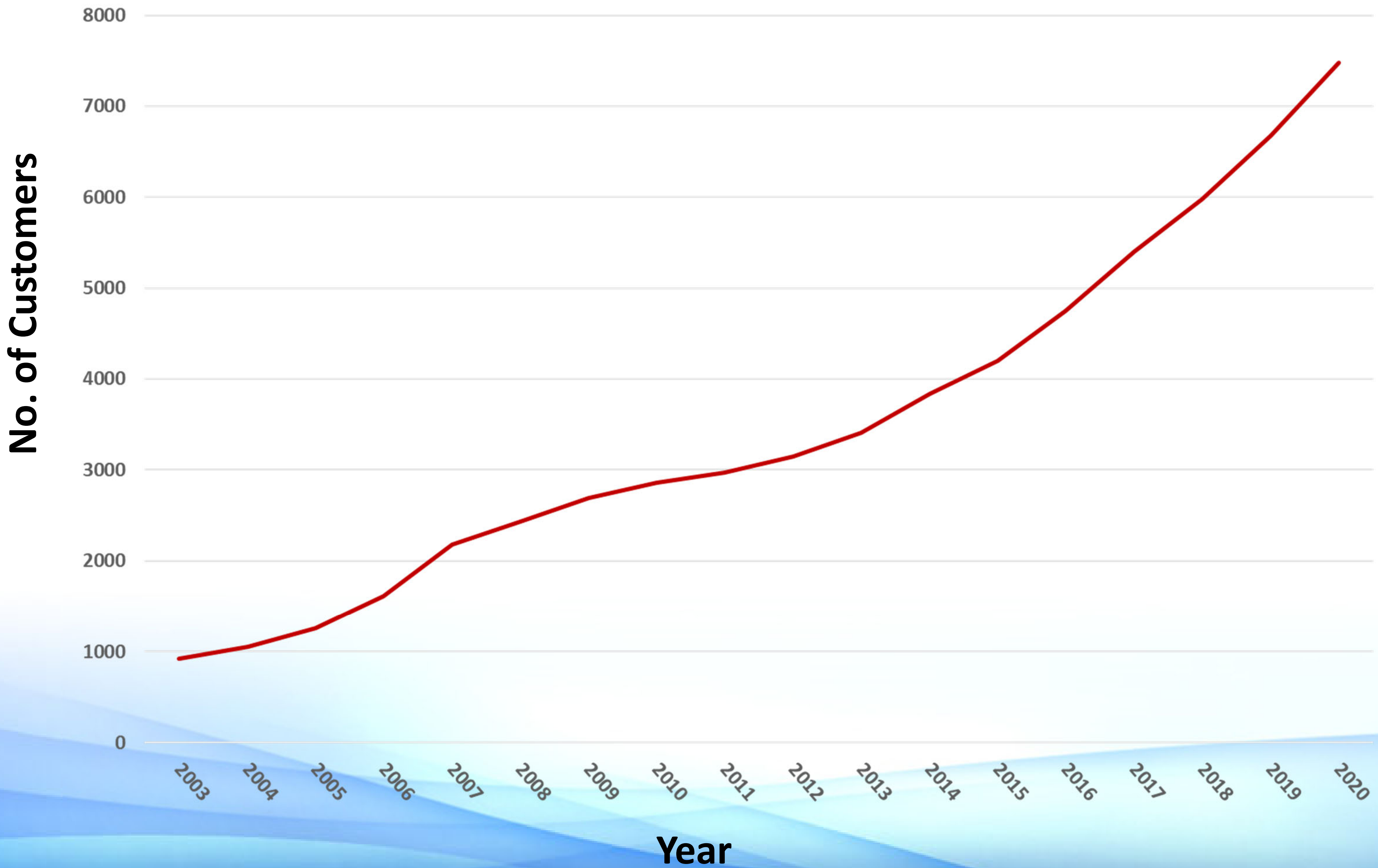
Four Oaks	Smithfield
Clayton	Pine Level
Selma	Utilities, Inc. (private utility)

  Aqua (private utility)

- Operate and maintain:

  -136 miles of gravity sewers
  -150 miles of force mains
  -61 wastewater pump stations
  -9.5 MGD WWTP

Wastewater Services: Retail Customer Growth



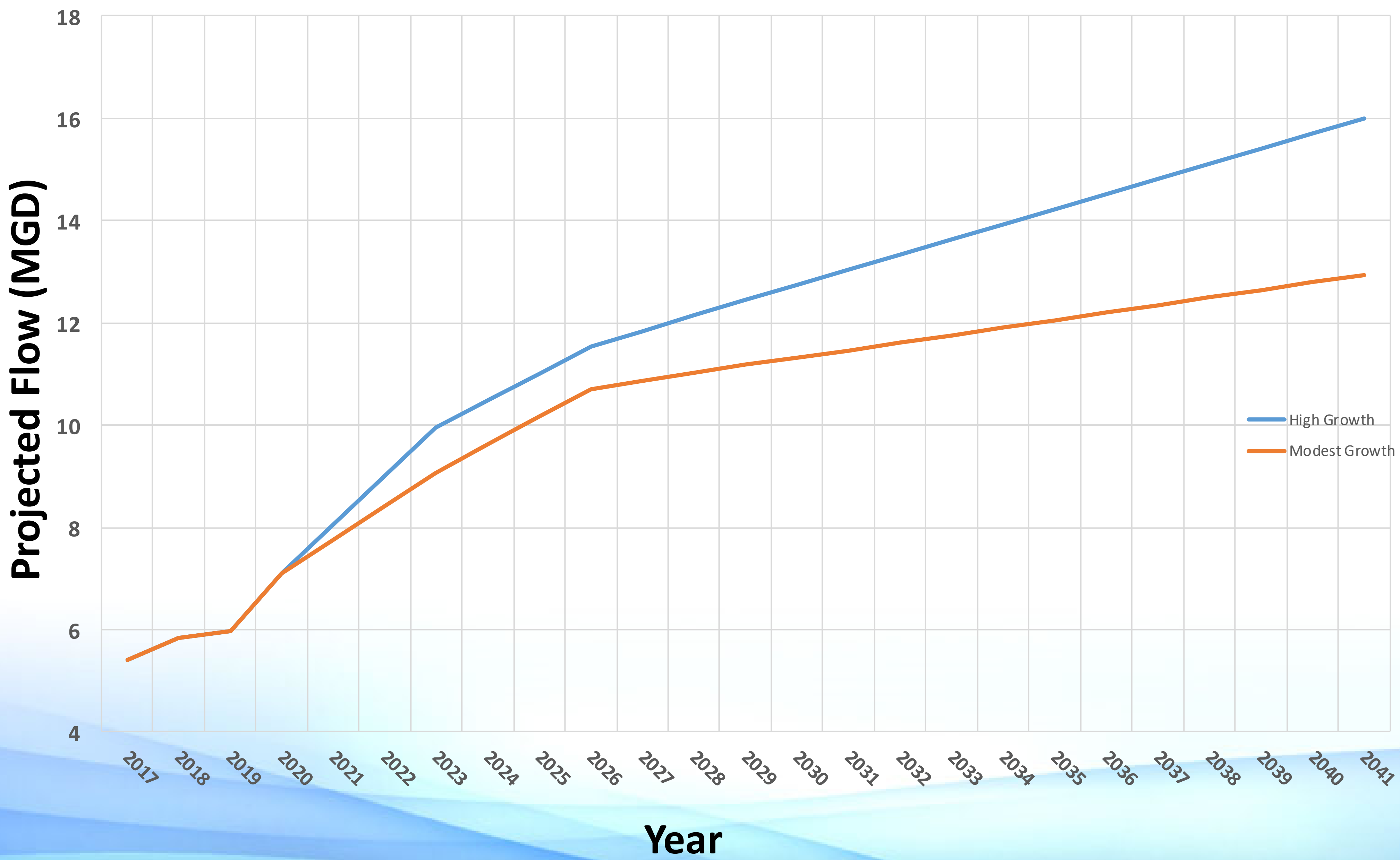
Wastewater Services: Capacity

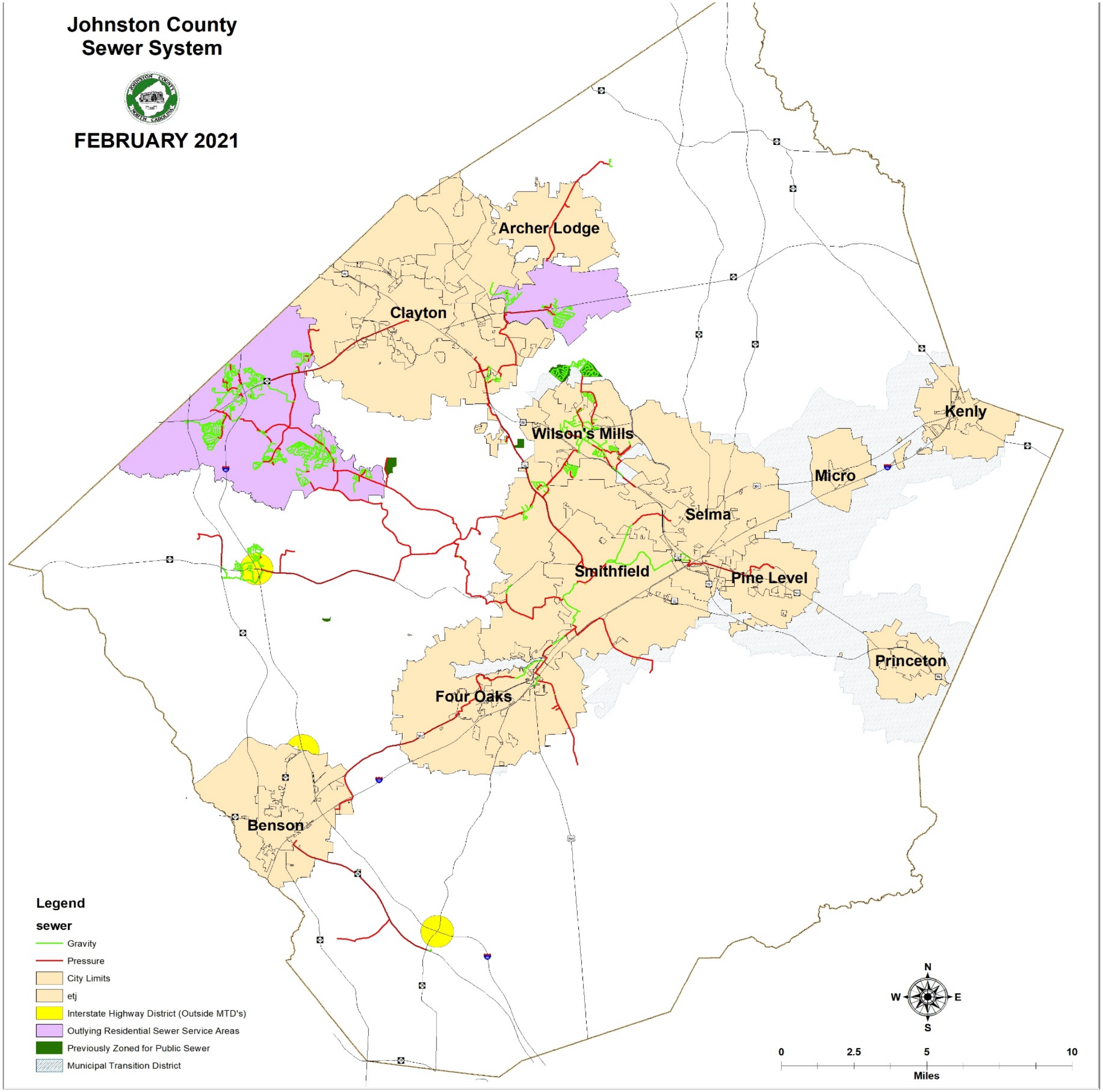
- WWTP Permitted capacity = 9.5 MGD
  - Average Daily Flow = 7.09 MGD (75% of capacity)
  - Committed "Paper" Flow = 1.90 MGD

    8.99 MGD (95% of capacity)
- Future Contract Commitments = 0.30 MGD
- Available Capacity CJCRWWTF = 0.20 MGD*
- Available Capacity w/ Benson = 0.19 MGD
- Pending Additional Capacity = 2.00 MGD

	2017	2018	2019	2020
Total Retail Customers	5,405	5,983	6,678	7,842
No. of New Retail Customers	655	578	695	804
Retail Customer Growth Rate (%)	13.8	10.7	11.6	12.0
Average Daily Flow (MGD)	5.40	5.84	5.97	7.09

Wastewater: 20 Year Flow Projections





Johnston County
Sewer System
FEBRUARY 2021
Archer Lodge
Clayton
Wilson's Mills
Selma
Kenly
Micro
Smithfield
Pine Level
Princeton
Four Oaks
Benson
Legend
sewer
Gravity
Pressure
City Limits
etj
Interstate Highway District (Outside MTD's)
Outlying Residential Sewer Service Areas
Previously Zoned for Public Sewer
Municipal Transition District
N
W
E
S
0
2.5
5
10
Miles

Wastewater Services: 20 Year CIP (Fund 68)

	Capital Project	2021-2025	2026-2030	2031-2035	2036-2041	TOTAL
1	Development Driven Upsizing (Cash)	$ 2,000,000	$ 2,500,000	$ 2,500,000	$ 3,000,000	$ 10,000,000
2	Buffalo Creek WWPS and FM (E-SRP-W-17-0068)	$ 4,405,000	$ -	$ -	$ -	$ 4,405,000
3	McGees Crossroads Sewer Upgrade (CS370560-16)	$ 8,696,920	$ -	$ -	$ -	$ 8,696,920
4	Upper Middle Creek Int (abandon Adams Pt WWPS)	$ 1,600,000	$ -	$ -	$ -	$ 1,600,000
5	Gravity lines to abandon Southgate & Eastpoint WWPS	$ -	$ 1,500,000	$ -	$ -	$ 1,500,000
6	Int from Duchess Downs to Adams Pt, Upsize Adams Pt	$ 2,000,000	$ -	$ -	$ -	$ 2,000,000
7	Upgrade Wilson's Mills WWPS & FM Connection	$ 1,850,000	$ -	$ -	$ -	$ 1,850,000
8	New Regional WWPS at I-95 & FM (Selma)	$ 3,000,000	$ -	$ -	$ -	$ 3,000,000
9	Upgrade Selma WWPS	$ 3,200,000	$ -	$ -	$ -	$ 3,200,000
10	Pine Level FM & WWPS Improvements	$ 5,200,000	$ -	$ -	$ -	$ 5,200,000
11	New 16" FM to Buffalo WWPS	$ 2,000,000	$ -	$ -	$ -	$ 2,000,000
12	Clayton K-5 WWPS Upgrade	$ 1,800,000	$ 750,000	$ -	$ -	$ 2,550,000
13	US 70 BUS 16" FM from ECIA to US 70	$ 1,500,000	$ -	$ -	$ -	$ 1,500,000
14	US 70 BUS 12" FM from US 70 to Swift Creek Rd.	$ 2,805,000	$ -	$ -	$ -	$ 2,805,000
15	Equalization at the Reedy Branch Regional WWPS	$ -	$ 1,000,000	$ -	$ -	$ 1,000,000
16	New 4 MGD 210 WWTF	$ 58,302,000	$ -	$ -	$ -	$ 58,302,000
17	Biosolids Facility Improvements	$ 18,400,000	$ -	$ -	$ -	$ 18,400,000
18	Improvements to Existing WWTF	$ 8,850,000	$ -	$ -	$ -	$ 8,850,000
19	New Effluent Outfall Line	$ 8,600,000	$ -	$ -	$ -	$ 8,600,000
20	Upgrade Landfill EQ & Pumping Facility	$ 8,000,000	$ -	$ -	$ -	$ 8,000,000
21	Force Main from Landfill EQ to WWTF	$ 2,400,000	$ -	$ -	$ -	$ 2,400,000
22	New Reedy Branch Regional WWPS & 24" FM	$ 7,950,000	$ -	$ -	$ -	$ 7,950,000
23	Nitrogen Strategy for 13.5 MGD	$ 10,000,000	$ -	$ -	$ -	$ 10,000,000
24	210 WWTF to 6 MGD	$ 17,500,000	$ -	$ -	$ -	$ 17,500,000

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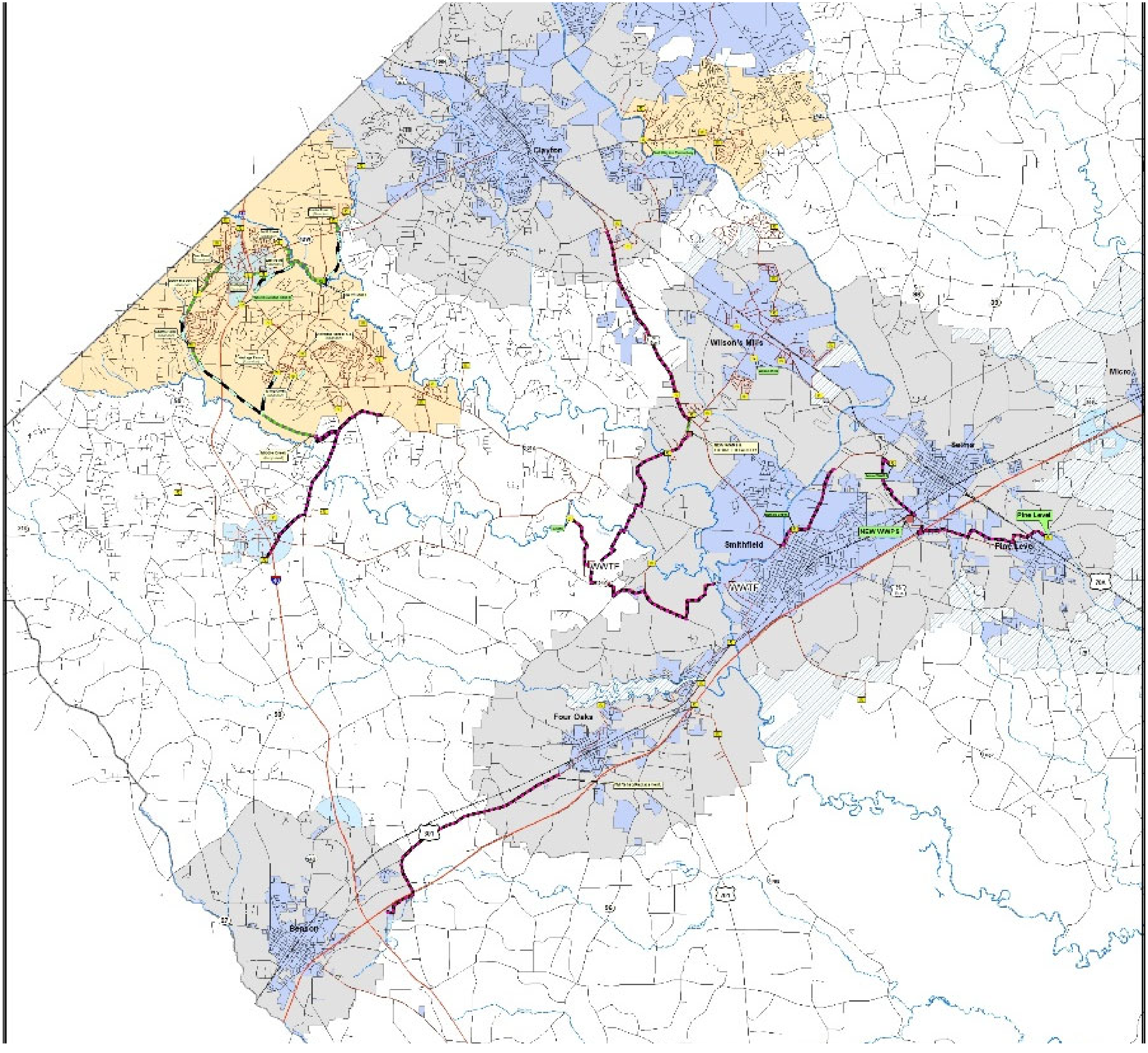
Wastewater Services: 20 Year CIP (Fund 68)

	Capital Project	2021-2025	2026-2030	2031-2035	2036-2041	TOTAL
25	210 WWTF to 8 MGD (decom 1.5 MGD) 16 MGD	$ -	$ -	$ 20,000,000	$ -	$ 20,000,000
26	New Blowers for Blower Building 2 - Existing Plant	$ -	$ 3,000,000	$ -	$ -	$ 3,000,000
27	Rehab AB at Smithfield Plant- Replace Diffusers	$ -	$ 1,200,000	$ -	$ -	$ 1,200,000
28	UV Bank Rebuilds at Smithfield Plant	$ -	$ 500,000	$ -	$ -	$ 500,000
29	210 WWTF to 12 MGD (decom 2 MGD) 18 MGD	$ -	$ -	$ -	$ 30,000,000	$ 30,000,000
30	New Chemical Tanks	$ -	$ -	$ 250,000	$ -	$ 250,000
31	Clarifier Drive & Scraper Replacements (4 total)	$ -	$ 250,000	$ 350,000	$ -	$ 600,000
32	WWPS Replacement/Rehabilitations	$ 750,000	$ 1,500,000	$ 1,500,000	$ 3,000,000	$ 6,750,000
33	Generator, ATS and Elec Improvements at WWPS	$ 330,000	$ -	$ -	$ -	$ 330,000
34	Odor Control Equipment at WWPS	$ 180,000	$ -	$ -	$ -	$ 180,000
35	Force Main Replacement	$ 1,500,000	$ 750,000	$ 1,500,000	$ 1,500,000	$ 5,250,000
36	Sewer Rehab Projects	$ -	$ 1,500,000	$ 750,000	$ 750,000	$ 3,000,000
37	Collection System Asset Management (Cash)	$ 1,000,000	$ -	$ 500,000	$ 500,000	$ 2,000,000
38	Collection System SCADA Upgrade	$ 1,500,000	$ -	$ 500,000	$ 500,000	$ 2,500,000
39	Building Exp for Maintenance Division (1/2 cost)	$ 75,000	$ -	$ -	$ -	$ 75,000
40	Replace Heavy Maintenance Equipment (1/2 Cost)	$ 75,000	$ 75,000	$ 75,000	$ -	$ 225,000
41	Asset Management Program (1/2 Cost)	$ 83,000	$ 20,000	$ 91,000	$ 24,000	$ 218,000
42	New Customer Service Center (1/2 Cost)	$ 150,000	$ -	$ -	$ -	$ 150,000
43	Upgrade Meter Reading Hardware (1/2 Cost)	$ 100,000	$ -	$ -	$ -	$ 100,000
44	Extend RCW to Lampe & Malphus Lumber	$ 700,000	$ -	$ -	$ -	$ 700,000
45	Extend RCW to Hospital Area	$ -	$ 1,000,000	$ -	$ -	$ 1,000,000
46	Sewer Study project	$ 200,000	$ -	$ -	$ -	$ 200,000
	TOTAL	**$ 186,701,920**	**$ 15,545,000**	**$ 28,016,000**	**$ 39,274,000**	**$ 269,536,920**

Fund 68 20-Year Total CIP = $269,536,920

Hurricane Matthew – October 2016



Clayton
Wilson's Mills
Selma
Micro
Pine Level
NEW WWPS
Smithfield
WWTF
WWTF
Four Oaks
Benson

Wastewater Services: Challenges

- Scheduling to fund/bid/construct necessary treatment & transmission projects for additional capacity
- Bulk wastewater services
  - **Projections from bulk customers**
  - **Updated bulk customer agreements**
- Retail service area planning
  - Dependent upon "Residential Sewer Service Policy" modifications
  - Land Development Code modifications
  - Timing of transmission and treatment capacity allocation
- Maintain reasonable user rates, SDFs (system development fees) and bulk capacity fees, but sustainable to support growing system demands

Capital Improvements Funding

- Cash for maintenance/replacement/operations projects
- SDFs and Capacity Fees for capital projects
  - Maintain $1.0 M balance per reserve fund
- Near-Term WW projects for treatment and transmission
  - $79 - $84 M SRF funding (1.1%, 20 years, level payments)
- FY 2022 Rev Bonds = $59,309,000 (30 yr, 4.0% interest)
  - $33,502,000 WWTP project costs
    - Case 1: level debt service
    - Case 2: wrapped around debt service on the WWTP SRF loan
  - $10,200, 000 other wastewater (Fund 68) projects
  - $15,600,000 Water District (Fund 69) projects

Capital Improvements Funding

- Future SRF Loan & Revenue Bond Assumptions

Year	SRF Loans*	Revenue Bonds**
FY 2023	$5,210,000	$5,000,000
FY 2024	$1,000,000	$17,500,000
FY 2025	$3,808,000	$26,805,000
FY 2026	$1,110,000	$6,952,590
FY 2027	$2,000,000	$1,140,240
FY 2028	$1,000,000	$1,054,800
FY 2029	$1,000,000	$1,000,000
FY 2030	$1,000,000	N/A
FY 2031	$1,000,000	$20,000,000

*20 year, 3.5% interest, level payments

**30 year (2 yr interest & 28 yr level debt service), 4.5% interest

Required Adjustments – Rate Model

Rate	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
Retail Water Base	$1.00	$1.00	$1.00	$1.00	$1.00	--
Retail Water Commodity	6.0%	6.0%	6.0%	6.0%	6.0%	--
Bulk Water	6.0%	6.0%	6.0%	6.0%	6.0%	--
Retail Sewer Base	$0.50	$0.50	$0.50	$1.00	--	--
Retail Sewer Commodity	5.0%	5.0%	5.0%	6.0%	--	--
Bulk Sewer	5.0%	5.0%	5.0%	6.0%	--	--

Service Type	Existing	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27
Residential Water (avg monthly bill)	**$37.00**	**$39.08**	**$41.22**	**$43.44**	**$45.72**	**$48.09**	**$48.09**
Residential Sewer (avg monthly bill)	$59.48	$61.45	$63.50	$65.62	$68.67	$68.67	$68.67
Residential Combined (avg monthly bill)	$96.48	$100.53	$104.72	$109.06	$114.39	$116.76	$116.76
Bulk Water (per 1,000 gal)	$2.85	$3.02	$3.20	$3.39	$3.60	$3.81	$3.81
Bulk WW Treatment (per 1,000 gal)	$3.00	$3.15	$3.31	$3.47	$3.68	$3.68	$3.68

NOTES:

- **Proposed adjustments based on Case 1. Case 2 reduces each volumetric rate increase by 0.5%. Base rate increases remain the same. Residential water average bill would be $47.53 in FY 27.**
- **Target Debt coverage is based on 1.5.**

Questions?