

CITY OF GRIFFIN WATER CONSERVATION PLAN UP-DATE 2016



System Management
Conservation
Measures
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Implementation
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Demand
Strategy

**WATER CONSERVATION PLAN UP-DATE
CITY OF GRIFFIN
2016**

This Water Conservation Plan Up-Date every five years is a condition of Permit GA2550000 to operate the City of Griffin Water System issued 2016.

System Management

The following table shows the Water Loss Percentages (NRW %) for the City of Griffin over the last 24-month period.

2014 Water Loss Percentages			
Month	System	Meter Sales	NRW %
Jan	76,320,380	53,740,400	30%
Feb	68,153,700	58,069,400	15%
Mar	72,851,200	52,756,200	18%
Apr	70,945,277	50,179,400	29%
May	71,430,120	50,947,800	29%
Jun	67,258,400	55,354,400	18%
Jul	72,775,390	57,195,100	20%
Aug	71,991,240	54,843,900	24%
Sep	65,493,700	55,610,900	15%
Oct	68,285,940	53,859,100	17%
Nov	63,990,248	43,638,748	32%
Dec	63,821,000	58,039,500	9%
Total	833,316,595	644,234,848	22.7%

2015 Water Loss Percentages			
Month	System	Meter Sales	NRW %
Jan	74,574,301	55,122,700	26%
Feb	71,624,348	57,830,800	19%
Mar	73,072,450	54,734,400	25%
Apr	70,558,448	55,027,200	22%
May	78,913,609	59,389,200	25%
Jun	76,102,300	63,138,100	17%
Jul	76,637,400	60,207,400	21%
Aug	86,139,600	73,507,100	15%
Sep	80,909,000	69,166,200	15%
Oct	77,210,000	62,990,300	11%
Nov	73,118,800	65,151,800	11%
Dec	74,716,700	63,913,200	14%
Total	913,576,956	740,178,400	19%

*April 2013 data was omitted from overall water loss percentage calculation since the results would overstate the City of Griffin's UAW%.

As shown in tables above, the City of Griffin's NRW was 22.7% and 19% respectively for the 24 month period starting from January 2014 through December 2015.

Current Programs to Reduce NRW is as follows:

- **Leak Detection and Elimination Program:** Since 2002, the water department's distribution crews have replaced over 10,639 service connections with brass and copper in order to eliminate existing PVC connections. All service repairs and replacements are tracked through the City of Griffin's work order and asset management software and ultimately linked to the City's G.I.S. network. The leak detection unit has the most modern equipment using Fluid Control's Data Loggers. Griffin has dedicated a crews routinely trained to address the leak locating capabilities in conjunction with their mobile unit. In 2015 the water department will establish a meter division and had 4 additional staff to leak detection program. In 2016 the data mining tool FATHOM will be deployed for additional early detection of leakage.

It is the City of Griffin's standard operating policy that all Non-Emergency leaks are repaired within 4.4 days after being notified of the leak. The response time is hindered do to the 1-800 DIG law. All major leaks (i.e. Emergency leaks) are repaired within 4 - 6 hours, in most cases, after the locates has cleared.

The City of Griffin has recently deployed Neptune's Fixed Base AMI software in order to analyze the water system for leaks on customer's service lines within the city limits. As noted above FATHOM data mining will be implemented in late 2016 to further improve NRW.

- **G.I.S Network:** The Public Works and Utilities Department operates and maintains the City's G.I.S. network. The network maps are up-dated on a continuous basis, allowing for the water department to have immediate access to the most current location of valves, hydrants, and water mains. Since the majority of the existing G.I.S. water network is based off of digitized paper maps, the City of Griffin, in 2014, started on using GPS technology in order to field locate the locations of all valves, hydrants, blow-offs and meters within our distribution network.
- **Meter Replacement and Testing Program:** All 22,500 residential meters (city and county) where replaced back in 2003 and 2004. Due to the evolution of metering technology, the City of Griffin decided in 2011 to upgrade the existing meters to a SMART and sustainable technology solution. Starting in late 2011, the City of Griffin began replacing all customers' meters to either Neptune AMI R-450 in the city and Neptune AMR R-900i meter in the Spalding County. AMI has been completed in the City and in July of 2016 the Hybrid AMR Neptune R-900i meters completed in Spalding County.

Using the guidance and recommendations set forth in the latest edition of the AWWA M6 manual, the water distribution department has established a bench testing program. The program is currently set up to test all meters 1" and smaller. The department currently tests approximately 10% of meters removed from the system annually. The City of Griffin is currently on a ten year replacement cycle for all residential meters and backflow devices. Large meters are inspected and tested annually and in some cases tested semi-annually. All water plant meters for wash water, raw water and finished water are calibrated twice a year.

- **Prevention of Tank Overflows:** The City of Griffin and Spalding County water tanks are equipped with altitude valves and SCADA. Griffin has a central control station and a 24-hour after-hours program in place to monitor the system at all times.
- **Line Flushing:** Flushing of finished water mains is practiced whenever water supply reserves are adequate. During drought conditions this is accomplished every other year. The program is designed to periodically and systematically remove oxidation by-products that accumulate in the water mains. Valve and hydrant maintenance are part of the line flushing program along with flow testing of each hydrant. In 2015 the City will begin in field assessment of valves and collected the GPS information the system. Griffin is reviewing the results and is developing a repair or replacement of valves.
- **Water Model:** 2015 the City is updated its water model with newer advanced computer software "Water Gems." This will allow for the review of potential DMA's in controlling water pressure in the system.
- **Unauthorized Use:** All fire hydrants used by contractors and other customers are regulated through the issuance of fire hydrants meters and the customer billed for all usage. In 2015 the City of Griffin established an Environmental Justice Court. Due to the growing environmental regulations in water, wastewater, Stormwater and sub-standard housing the court was established and address issue of utility theft and illicit discharges.
- **Unmetered Service Connections:** The City of Griffin requires that "ALL" service connections be metered and billed for consumption.
- **Water Conservation Rates:** On March 1, 2008 the City of Griffin implemented conservation water and irrigation rates in order to encourage conservation of water used by the customer. Rate increases occur annually when adjusted to the Municipal Cost Index (MCI). If for some reason the cost index does not go up the rate remain the same for that year. The results of implementing the rates has decreased water consumption by 20% in our system. In 2008 Residential gallons per capita per day was 64.2 gallons in 2015 50.6 gallons.
- **State Water Audit Results:** City of Griffin Water Audit

Year	2011	2012	2013	2014	2015
ILI Score	11.31	8.76	8.87	7.21	6.8
Validity Score	81	71	77	81	81

2015 Water & Wastewater Rate Structure as approved

Water / Wastewater Rate Structure		
CITY Residents - Base Charges		
Size	Water Base Charge	Sewer Base Charge
	Current Rate	Current Rate
3/4", 5/8"	\$12.48	\$16.98
1	\$26.73	\$19.98
1 1/4	\$30.86	\$31.84
1 1/2	\$36.72	\$37.91
2	\$63.17	\$65.19
3	\$117.51	\$121.27
4	\$183.62	\$189.5
6	\$367.24	\$378.98
8	\$543.53	\$560.91

CITY Residents - Water Rate Structure	
Consumption	Rate
Base Charge	Dependent upon water meter size see base charge table
2,001 - 7,000 gallons	\$5.63 per 1,000 gallons
7,001 - 10,000 gallons	\$7.04 per 1,000 gallons
Over 10,000 gallons	\$8.45 per 1,000 gallons

COUNTY Residents - Water Rate Structure	
Consumption	Rate
Demand Charge	\$13.71 per customer
0 - 7,000 gallons	\$7.37 per 1,000 gallons
7,001 - 10,000 gallons	\$9.14 per 1,000 gallons
Over 10,000 gallons	\$9.98 per 1,000 gallons

IRRIGATION - Water Rate Structure	
Please refer to local drought conditions before use	
Consumption	Rate
Base Charge	\$12.45
Over 2,000 gallons	\$8.45 per 1,000 gallons

COMMERCIAL - Water Rate Structure	
Consumption	Rate
Base Charge	-
All	\$5.63 per 1,000 gallons

INDUSTRIAL - Water Rate Structure	
Consumption	Rate
Base Charge	-
0 - 99,999 gallons	\$5.63 per 1,000 gallons
100,000 - 500,000 gallons	\$5.06 per 1,000 gallons
Over 500,000 gallons	\$4.51 per 1,000 gallons

CITY Residents - Sewer Rate Structure	
Consumption	Rate
Base Charge	Dependent upon water meter size see base charge table
Over 2,000 gallons	\$7.78 per 1,000 gallons

INDUSTRIAL / COMMERCIAL - Sewer Rate Structure	
Consumption	Rate
Base Charge	-
All	\$7.78 per 1,000 gallons

RESIDENTIAL - Sewer Flat Rate	
Consumption	Rate
All	\$52.38

COMMERCIAL - Sewer Flat Rate	
Consumption	Rate
All	\$5.64 per 1,000 gallons

Improvements to Reduce Non-Revenue Water

The City of Griffin has set a goal of 12% NRW as a target, 3% better than industry standard of 15%. City of Griffin current non-revenue water is 19.0%.

- **Replacement or Rehabilitation of Pipes:** Since 2008, the City of Griffin has been the recipient of five Community Development Block Grants (CDBG). The seven (7) CDBG projects has allowed for the replacement and/or rehabilitation of aging water and sewer infrastructure totaling over 6.25 million dollars. Along with these grants, the City has also made spot renewals on an as-needed basis within the city.
- **Audit of Metering and Billing Records:** The water department conducts regular audits throughout the year to ensure both the meter and billing records are accurate. In 2008, the City of Griffin updated their billing system to Cogsdale providing the City with a more robust reporting and billing solution. It should also be noted, due to the stipulations laid out in the Water Stewardship Act of 2010, the City of Griffin and Spalding County water systems have filed their respective annual state water audit reports. In 2015 N_Sight Neptune program has allowed us improve our zero consumption, vacant consumption and maintenance disconnect with consumption.
- **Interconnections with Other System:** The City of Griffin's water distribution system currently has interconnections with the following municipalities and/or authorities: Clayton County, Henry County, and Butts County. These interconnections provide emergency supply on an as-available basis. The hydraulics of the system allows the City to take 5.0 MGD.

Water Treatment Plant Management

The City of Griffin's treatment facilities include the Harry S. Simmons Water Treatment Plant (HSWTP) and the Still Branch Water Treatment Plant (SBWTP). The permitted withdrawal capacities of the plants are as follows:

- Harry S. Simmons WTP: combined flint river and/or heads creek reservoir withdrawal 13.2 MGD (maximum day) 12.0 MGD (monthly average)
- Still Branch WTP: flint river withdrawal 50.0 MGD (maximum day and monthly average), still branch regional reservoir withdrawal 48.0 MGD (maximum day) 42.0 MGD (monthly average)

In 2014 the up-grade of Still Branch Reservoir was completed. The upgrade consisted of modifying the current treatment process to a Dissolved Air Floatation process. In by doing so the treatment capacity of the Still Brach WTP will increase from its current 8.0 MGD capacity to a potential 12.0 MGD capacity. In conjunction with the up-grade the plant now uses 80% less finished water in cleaning filters. All water leaving both the Harry Simmons and Still Branch WTP's is metered. In 2015 the city completed a condition analysis of the 1929 raw water mains, 1929 Harry Simmons Treatment Plant and the 1964 Heads Creek Pump Station. The 1929 Flint River Pump Station is currently being replace and schedule for operation at the end of 2016.

Harry S. Simmons Treatment Plant has meters at the following locations:

- At each of the two pipes leaving the Flint River Raw Water Pumping Station. This station and meters are being replaced in 2016 at a cost 8.275 million dollars.
- At the pipe leaving the Heads Creeks Reservoir Raw Water Pumping Station.
- At the raw water supply pipe entering the Harry S. Simmons Water Treatment Plant.
- At each of the two finished water mains leaving the water plant entering the distribution system.

Each of the meters above provide continuous flow monitoring capabilities and the ability to account for all water lost within the raw water transmission mains and within the treatment plants operations.

Still Branch Regional Reservoir and Treatment Plant locations

- Discharge side of Raw Water River Pump Station.
- Discharge side of Reservoir Pump Station.
- Discharge side of Finish Water Pumps.
- Master meters are at all take points along the transmission main for the City of Zebulon, City of Williamson, City of Concord, Coweta County, Lamar County, and Butts County.

In-Plant Water Use: the tables below exhibit the monthly quantities of raw water withdrawn from the Flint River and Heads Creek Reservoir for Harry S. Simmons and the Still Branch Regional Reservoir treatment facilities.

Harry Simmons Plant						
Month	Raw Water Withdrawn (GALLONS)	Wash water (GALLONS)	Total In-Plant Use (Gallon)	In-Plant Use as % Raw Water Withdrawn	Reservoir	%
Jan-15	268,860,000	2,510,000	8,120,000	3.02%		
Feb-15	253,320,000	2,270,000	7,850,000	3.1%		
Mar-15	231,070,000	1,730,000	7,430,000	3.22%		
Apr-15	161,730,000	1,750,000	16,150,000	9.9%		
May-15	233,540,000	1,920,000	29,530,000	12.6%		
Jun-15	225,850,000	1,760,000	13,160,000	5.83%		
Jul-15	178,630,000	1,390,000	7,810,000	4.37%		
Aug-15	232,590,000	1,710,000	9,870,000	4.24%		
Sep-15	170,610,000	1,730,000	14,860,000	8.71%		
Oct-15	166,940,000	1,720,000	12,900,000	7.73%		
Nov-15	181,420,000	1,980,000	8,570,000	4.82%		
Dec-15	155,260,000	1,600,000	6,360,000	4.09%		
		22,070,000	142,430,000	5.8%		
	2,459,820,000					
Month	Raw Water Withdrawn (GALLONS)	Wash water (GALLONS)	Total In-Plant Use (GALLON)	In-Plant Use as % Raw Water Withdrawn		
Jan-15	382,170,000	1,100,000	1,380,000	.004%	11,400,000	12.1%
Feb-15	11,931,000	1,340,000	1,340,000	11.23%	9,930,000	13.5%
Mar-15	64,060,000	1,090,000	1,176,000	1.84%	52,340,000	.02%
Apr-15	124,100,000	1,280,000	3,656,000	.295%	111,710,000	.32%
May-15	238,630,000	1,470,000	3,870,000	.162%	94,160,000	.04%
Jun-15	150,730,000	1,460,000	2,979,000	.198%	65,830,000	.045%
Jul-15	233,700,000	3,450,000	5,403,000	.231%	129,450,000	.42%
Aug-15	196,520,000	3,650,000	4,658,000	.237%	126,170,000	.37%
Sep-15	286,800,000	3,550,000	4,561,000	.159%	123,580,000	.37%
Oct-15	312,060,000	2,500,000	2,560,000	.082%	127,370,000	.2%
Nov-15	127,670,000	1,150,000	1,150,000	.09%	89,150,000	.13%
Dec-15	168,770,000	1,150,000	1,283,000	.076%	120,650,000	.1%
Total	2,297,141,000	23,190,000	34,016,000	.015%	1,061,740,000	.032%

As demonstrated in the above table the total in-plant water use average is 2.92%% of total water withdrawn from the Flint River. It is the City of Griffin goal to reduce the total in plant water use to within the accepted industry standard of 3-5%

Policies to reduce Harry S. Simmons WTP in-plant water use:

- Overflow from sedimentation basins is controlled visually by inspecting the basins and adjusting the weirs as needed to prevent overflow.
- Clear wells are monitored by a depth gauge to prevent overflow of finished water.
- Water levels in the wash tanks are gauged at the water tank to prevent overflow.
- Unnecessary filter washing is reduced by backwashing the filters when either of two conditions occur: the loss of head reaches 5.5 feet (which prevents overflow in the sediment basins) or the filter run reaches 168 hours.

Policies to reduce Still Branch WTP in-plant water use:

- It is anticipated that upon the completion of the Dissolved Air Flotation system, the Still Branch WTP will improve its in-plant water use to less than 2%.

Recycle and Reuse

Harry S. Simmons Plant does not recycle spent backwash water due to concerns with recycling of pathogens such as giardia and cryptosporidium.

Rate Making Policies

Water conservation by customers is accomplished through the system rate policy which includes conservation and irrigation rates. With demands on the water resource, Griffin found it necessary to establish conservation and irrigation rates to ensure efficient use of the resource. The following policies were considered by the governing officials when adopting a water rate policy.

- Meter and Billing Service Connections: Griffin’s policy is that all service connections are metered and billed. For the year ending June 30, 2015 the breakdown of customer usage is based on metered water volume:

%Total Usage	Griffin Residential	Griffin Commercial/Industrial	Griffin Wholesale
	17%	10%	73%

Rate Making Policies

- Wholesale: Griffin sells wholesale water to City of Williamson, City of Zebulon, City of Concord, Spalding County, Lamar County, Coweta County, Butts County, and Springs Industries at rates governed by long term contracts and designed to recover actual cost plus twenty percent profit. These wholesale rates are calculated annually based on audited costs and are levied at a uniform charge per unit of water volume sold to each wholesale customer.

- **Retail:** Rates to retail customers are annually reviewed by the City Commission as needed to maintain the financial goals of the system. In addition, Griffin has an automatic annual increase calculated on the Municipal Cost Index (MCI) which is instituted on March 1st of each year. Griffin rate structure currently is calculated on a monthly charge based on meter size (\$12.48 for a typical residential meter) plus a uniform charge of \$5.63 a thousand gallons for the first 7,000 gallons, \$7.04 for 7,001 to 10,000 gallons and \$8.45 for 10,001 gallons or greater. A copy of the rate structure is enclosed. Additionally as a deterrent to summertime usage, wastewater charges are levied against all water usage on the primary meter.

NOTE: Irrigation meters used for landscaping are exempt from sewer charges. Separate sewer meters are allowed only in special conditions such as industries that have high consumptive use or pretreatment requirements or other special circumstances.

Statements of Self-Supporting Water System

Griffin’s policy is that the water and wastewater system generates sufficient revenue from water rates to pay all obligations of the water system including renewal and extensions of the system. The water system is not subsidized by taxes or any revenue source other than customer fees. Griffin’s finances improvements to the system utilizing G.E.F.A. loans, Grants and Revenue Bonds that are repaid from water system revenue. The current Bond Resolution as adopted by the City Commission places legal binding obligation upon the governing officials to operate the water and wastewater system in a manner to ensure that it is financially self-supporting. The Bond Resolution requires that officials increase rates as needed to ensure financial goals specified in the Rate Covenant are satisfied.

Plumbing Ordinances and Codes

- Water Saving Fixtures and Devices: the City of Griffin has adopted the International Plumbing Code, latest edition, which stipulates ultra-low flow plumbing fixtures complying with current Georgia Law for new construction. An excerpt from Griffin’s Plumbing Code is attached:
- Griffin currently offers a toilet rebate credit ultra-low flow toilets and faucets.

Fixture	Ultra-Low Flow Limit
Toilets	1.12gpf
Urinals	1.0gpf
Shower Heads	2.0gpg
Kitchen Faucets	1.5pgf
Bathroom Faucets	1.0gpf

- Other Ordinances or Practices: Under normal conditions, the City of Griffin does not restrict the use of water for irrigation, but does have conservation rates for such water. During drought periods of shortage, the city does invoke restriction on non-essential use of water in accordance with its drought contingency plan.

Reuse – Recycle

- Reuse or Recycle of Treated Wastewater: Griffin's Potato Creek WWTP and Cabin Creek WWTP use treated wastewater for in-plant use to the extent practical, including wash down of process equipment and chemical feed supply. This reduces the use of potable water significantly. Griffin's third WWTP, Shoal Creek LAS does not lend itself to reuse because LAS treatment does not generate effluent of reuse quality.
- Recycle or Reuse of Cooling Water: Reuse of cooling water is required in Griffin's industries located within the city limits. Since the early 2000's, all industries have complied and have converted to the recycling and/or reuse programs.

Education Programs

The City of Griffin has an extensive education program encompassing water, wastewater, and stormwater. In 2002 the City of Griffin combined its operations to house all three components under the same department which has allowed the coordinated effort for public education and public awareness of all water resources and its value to the everyday citizens.

- Billboards are used to promote water conservation and water quality.
- Distribution (via libraries, schools, public buildings, water bills) of educational pamphlets promotes in-house water conservation, xeriscaping, watershed awareness, and water quality. This is current, and an on going practice.
- Public service announcements (PSA's) are used on local radio stations.
- Local news papers publish numerous articles to inform citizens of drought conditions urging conservation and provide educational ideas on how to conserve water. This is current and an on going practice.
- Public Works and Utilities Department maintains its own website www.cityofgriffin.com and offers numerous articles and links on water conservation to its customers and others.
- Griffin has an interactive kiosk in City Hall which links to numerous articles, websites, and programs for water conservation.
- The City of Griffin employs through the County Extension Office a Para professional who teaches on water, wastewater, stormwater and watershed management for 30 hours a week and nine months out of the year.

Progress Reports

A progress report will be submitted to GaEPD every five years as outlined in the conservation plan on actions and/or improvements made to conserve water and NRW.

Water Use Data Reporting

The City of Griffin will submit to GaEPD an annual water use data report which includes information on NRW for the previous 12 month period.

Drought Contingency

Drought Condition Indicators

Conditions which cause the normal supply of water and pressure to be reduced excessively would be considered a drought or an emergency which would cause the City to put its priority use system in effect. These conditions could be any one or more of the following:

1. High water demand
2. Drought or excessive heat conditions
3. Supply interruptions
4. Power failures
5. Water main breakage or failure

Water Use Priorities under Drought and Emergency Conditions

The City of Griffin has adopted a priority system for the use of water during Drought and Emergency conditions and goals for water use reduction under those conditions.

Water Use Priorities

The following is the order of potable water use priorities:

1. Emergency use for essential life support services;
2. Domestic and personal use including drinking, cooking, washing, sanitary and health related use;
3. Farm use;
4. Industrial use;
5. Other use such as lawn sprinkling, non-commercial car washing, garden watering, etc.;
6. Outdoor recreation use.

Drought/Emergency Conservation Plan

The following paragraphs outline a Drought /Emergency Conservation Plan for the City. The plan is divided into four stages of emergency conditions. These are briefly described as: minor, moderate, severe, and critical. The basis of initiation for stage of drought is the source flow. The following source flow numbers are for comparison and reference:

1. Average Source Flow	353	cfs
2. 7Q10 Flow	10	cfs
3. Plant Capacity (12 MGD)	18.6	cfs

Stage #1 (Minor Emergency Condition):

Criteria for declaring and implementing Stage #1 Emergency Condition:

1. Raw Water Source Flow less than 7Q10 flow for more than 7 days.
2. Plant operation limited by construction or equipment failure.
3. Contamination of raw water source requiring temporary shutdown of treatment while contamination passes by intake

Conservation Methods undertaken in response to Stage #1 Emergency Condition:

Public service announcements will be made on local radio stations and newspaper media requesting that customers curtail the use of unnecessary water. This will primarily be aimed at limiting the practice of watering lawns,

gardens, washing cars, and other practices that not essential during emergency conditions. In addition, fire departments and others will be asked to curtail water main flushing, dust control, and other nonessential use of water. The request of the Director under minor conditions shall be on a voluntary compliance basis.

Consumption reduction goal for Stage #1 is 10%.

Stage #2 (Moderate Water Emergency)

Criteria for declaring and implementing Stage #2 Emergency Condition:

1. Raw Water Source Flow equal to or less than 7Q10 flow for more than 14 days.
2. Neighbor communities are at Stage #3 due to drought conditions.
3. An increase in water usage more than 40% of the seasonal norm.

Conservation Methods undertaken in response to Stage #2 Emergency Condition:

Media intensity or degree of announcement in the local television, radio, and newspaper will be increased above the Stage #1 level along news releases by the Director of the Water & Wastewater Department explaining the severity of the problem. The Director will make a strong appeal for the voluntary reductions of water usage. The same water reduction methods that were outlined in Stage #1 will be implemented with the addition that City crews and in some cases, public safety officials will be asked to actually field monitor water usage. If customers are observed using water for non-essential purposes, they will be contacted on the site with house calls and asked to curtail water use. After two requests are made if the customer is still using water, his water service will be cut off at the meter and a reconnection fee will be charged to return the customer to service.

Consumption reduction goal for Stage #2 is 15%.

Stage #3 (Severe Water Emergency)

Criteria for declaring and implementing Stage #3 Emergency Condition:

1. Raw Water Source Flow equal to or less than 7Q10 flow for more than 21 days.
2. Neighbor communities are at Stage #4 due to drought conditions.
3. There is a steady decline in storage tank levels.
4. There is little or no pressure in high service areas.

Conservation Methods undertaken in response to Stage #3 Emergency Condition:

In addition to the Director of the Water & Wastewater Department, the Mayor will make appeals to customers of the system in the local media. In addition, news briefings will be sent to individual customers outlining the problem. A more severe ban on water usage will be required, and prohibition of all public water use not required for public health and safety will be activated. No water cooled air conditioners will be allowed without recirculation. Businesses such as car washes and Laundromats will be asked to curtail operations for limited periods. High water using industries will be asked to curtail operations if they operate in more than one shift. The penalty for ignoring the water warnings will result in shutoff of water service to the business upon first notification.

Consumption reduction goal for Stage #3 is 30%.

Stage #4 (Critical Water Emergency)

Criteria for declaring and implementing Stage #3 Emergency Condition:

1. Raw Water Source Flow less than 7Q10 flow for more than 30 days.
2. Very low levels at raw water source intake.
3. The water plant is unable to operate at 100% capacity because of low water source levels.
4. Storage levels are at 50% of capacity, dropping steadily, and are not replenished overnight.
5. Neighbor communities under severe conditions.

Conservation Methods undertaken in response to Stage #4 Emergency Condition:

Public officials and leaders will speak to the public on radio and TV, through newspapers, and through news briefings delivered to each individual customer. Prohibitions will be imposed on the use of any water for outside activities not essential or required for health and safety. Any business that is a high water user will be required to curtail operations for limited periods until the water emergency has subsided. The City will request that individual residents only wash clothes and use water for bathing every other day based on an alphabetical system. In addition, the personal of the Water and Wastewater Department, and the Sheriff's department will be asked to monitor unnecessary use of water. The City will take measures to reduce pressure to the minimum permissible levels in areas where it is possible to do so. As a last resort, the City will temporarily terminate service to selected portions of the system at alternate intervals.

Consumption reduction goal for Stage #4 is 50%.

Low Flow Protection

The City is currently operating Harry Simmons water treatment plant on a 12.5 MGD (12 MGD average month with 13.2 MGD peak day) withdrawal permit from the Flint River. When the flow in the river is equal to or less than 10 cfs (7Q10 flow), the City may not withdraw water from the river. Griffin also operates the Still Branch Regional Reservoir water treatment plant 12.0 MGD. The plants' withdrawal permit operates on season flow.

Low Flow Monitoring

The City has installed a USGS staff gauge at the raw water intake to be used in monitoring the daily flow in the Flint River. The City has installed a second staff gauge located 300' south of Hampton "Woolsey" Road. This staff gauge is in Fayette County and will be monitored during low flow times in the Flint River to ensure that an adequate amount is flowing into Spalding County. This supply is for the Harry Simmons treatment plant. Still Branch Regional Reservoir has USGS flow gauges at the raw water intake to be used in monitoring daily flow in the Flint River. These gauges are upstream and downstream of the intake. These gauges are monitored during low flow times in the Flint River in Pike County outside of Molena.

Water Storage

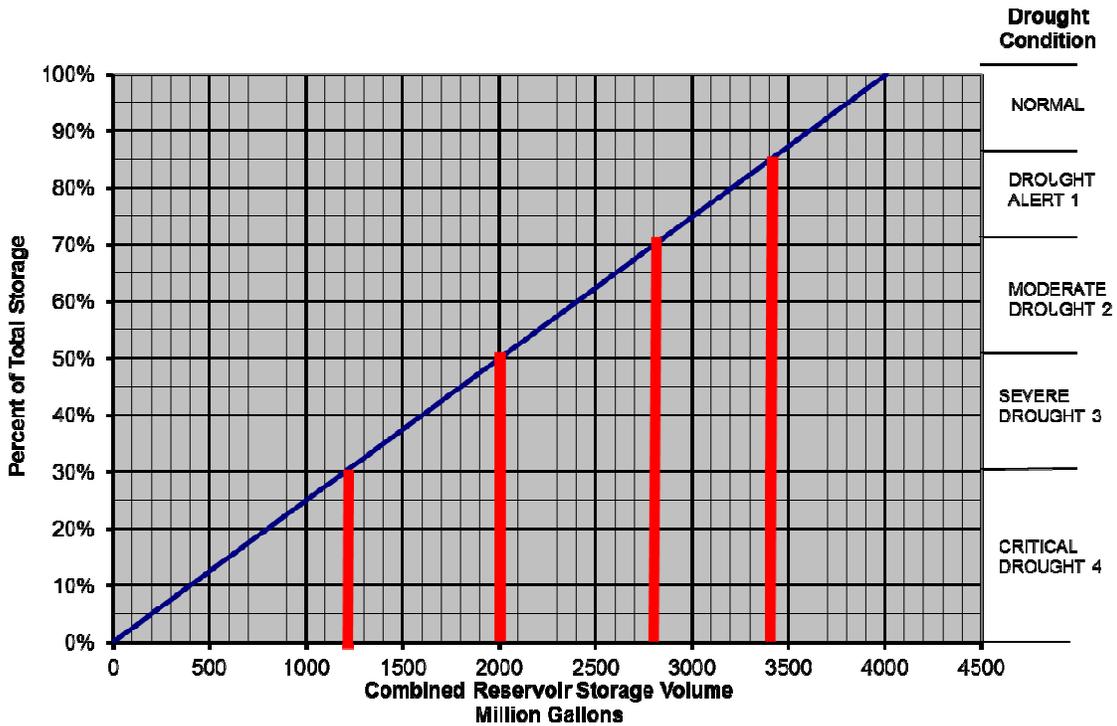
The City has Heads Creek Reservoir to supplement flow in the Flint River during times of drought. The reservoir covers 314 acres and has an estimated 736 million gallons of usable storage. The firm yield during drought of the combined Heads Creek reservoir and Flint River intake system is calculated to be 7.7 MGD annual average. Still Branch

Regional Reservoir covers 475 acres and has an estimated volume of 3.5 billion gallons of usable water.

Additional Water Sources

The City of Griffin has a pipeline connection to the Clayton County system for additional treated water. The available flow with the piping connection is 600,000 gallons per day. The piping is arranged to allow a temporary pump to be added to the system raising the available flow to 1,000,000 gallons per day. During a drought condition the City of Griffin could therefore gain an additional 1,000,000 gallons per day into their system. Butts 500,000 gallons per day could be augmented to system.

Drought Condition vs Reservoir Storage



RESTRICTIONS ON WATER USE FOR VARIOUS DROUGHT CONDITIONS							
LEVEL	Drought Condition	Water Use Priority					
		1 Emergency & Health Facilities	2 Domestic & Personal Use	3 Essential Farm & Food Production	4 Industrial & Commercial	Landscape Irrigation, recreational	6 Washing cars, streets, etc.
0	Normal (Non-drought) (85-100%)	None	None	None	None	State-wide (EPD) day of week restrictions	State-wide (EPD) day of week restrictions
Employ sound water conservation practices.							
1	Drought Alert (70-85%)	None	None	None	None	Restrict to fewer days with limited hours	Prohibited
Use public awareness ads with local media to alert public to conditions and restrictions.							
2	Moderate Drought (50-70%)	None	None	None	Voluntary Ration Limit	Restricted days & hours + surcharge rate	Prohibited
Increase use of public education program and local media sources to explain the drought conditions and water use restrictions. Enforcement of prohibited use will be a fine for each offense.							
3	Severe Drought (30-50%)	None	Voluntary Ration Limits	Voluntary Ration Limits	Surcharge for exceeding ration	Prohibited	Prohibited
More intensive use of public education programs and local media sources to explain the drought/emergency conditions and imposed water restrictions. Enforcement of prohibited use will be a fine for each offense.							
4	Critical Drought (0-30%)	Voluntary Ration Limits	Surcharge for exceeding ration	Surcharge for exceeding ration	Surcharge for exceeding ration	Prohibited	Prohibited
Continue intensive use of public education programs and local media sources to explain the drought/emergency conditions and imposed water restrictions.							

**Water Conservation and Efficiency
Schedule of Events**

Activity	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Source Water Metering	Pre 1998																		
Service Connection Metering - AMR						Total Traditional Replacement								Telemetry Read R450 COG			Drive-By R990i Spalding		
Conservation Rate Structure											COG and Spalding Increases Each Year with MCI								
Informative Billing											CogsDale Billing Usage Graphs								
Testing and Meter Calibration											2007 All Large Meters and 2013 Started Bench Testing Residential								
System Audit						2002 Reporting Internal and in 2010 Started State Audit Program													
Leak Detection											2006 Funded Equipment and Crew - 2014 New Hydraulic Analysis and Annual Updates								
Pressure Zones																			
Landscape - Irrigation	Required all Irrigation Systems Individually Metered																		
PIE	Started with Stormwater and Advanced to Water/Wastewater - 2010 Hired Para-Professional for Griffin Spalding Scholl System																		
Water Bill Inserts	On-Going																		
Reuse	Potato Creek and Cabin Creek Wastewater Treatment Plants - 2008 Spalding County Peachtree Sun City Golf Course and Medians																		
Land Use																UDO and Stormwater Updates			
Sub-Metering											Required								
Incentive Based Conservation											Toilet Rebate Program and Aerators								
Master Planning	Has Been Implemented and Updated 3 Times for Water-Wastewater-Stormwater																		
Conservation Plan											Revised in 2008 and 2013								
Drought Management Plan											Written in 2002								
Retail Rate Model Tool													Raftelis Create Tool						
Wholesale Rate Model Tool													Raftelis Create Tool						
Rehabilitation-Renewal- Replacement											Community Development Block Grants I,II,III,IV,V,VI								
Service Line Renewal	Start Copper and Brass Program and have Renewed Over 5,000 Connections																		

