USDA/FSA

SOURCE WATER PROTECTION PLAN

CITY OF BROOKLET

Water System I.D. # GA0310000

Bulloch County

Georgia

March 2023

Source Water Protection Plan

For Public Drinking Water Sources
in the
City of Brooklet
Bulloch, County
Georgia

March 2023

Prepared by:
The City of Brooklet
Source Water Protection Steering Committee

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Annual Review and Update

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SUMMARY

Source wells #101 and #102 currently supply Brooklet with drinking water. Although both wells are completed in the deep and confined Upper Floridan Aquifer, not enough is known about their construction to determine if the wells are not also hydraulically connected with the shallower, unconfined aquifer. For this reason, and because the wells were drilled over 70-90 years ago, the Georgia Environmental Protection Division (EPD) has established management zones around the wells as if they are shallow wells and more vulnerable to surface or near-surface contamination. Brooklet can use these management zones to *proactively* focus management efforts there to reduce or eliminate activities that could contaminate either drinking water source. These efforts are important because the wells are located in the downtown area where numerous domestic and non-domestic septic systems are present. The possibility of old wells nearby with failed or ungrouted casing could create a path for shallower contaminants to travel down into the confined, Upper Floridan Aquifer. Several of the more likely scenarios of how the Booklet drinking water supply could become contaminated or disrupted are:

- Septic Systems & Waste Lagoons – Infiltration galleries for viruses, nitrates, chemicals and medicines
- Underground and above ground tanks – Petroleum or chemical leak
- Agricultural practices – Improper use of pesticides, herbicides, or fertilizers
- Roadways & Railroads – Both U.S. highway 80 and Parker Ave. extend through the town of Brooklet and both host traffic transporting petroleum compounds and farm/industrial chemicals. Accidents and spills along any of these roads could contaminate surface and groundwater in the area. It is also possible that source well #102 could be damaged from a vehicle due to its close proximity to Railroad Street.
- Security – A cybersecurity breach is increasingly likely to impact any water system. Regarding physical damage, casual vandalism is considered more likely than determined sabotage.

The town should update existing zoning ordinances that restrict or regulate activities in the town and especially within the Inner Management Zone for each well. An effort to inform local citizenry of restricted or unwise activities is crucial because it is far easier to prevent contamination from occurring than it is to remediate a contaminated aquifer, if remediation is even possible at all. A new well is planned to be drilled at the Brooklet City limits adjacent to Hwy 80 north of town.

The Source Water Protection Committee that generated this Source Water Protection Plan utilized many "what if " scenarios to provide a template for protecting Brooklet's drinking water from foreseeable contamination or disruption, both likely and unlikely. The committee is comprised of Georgia Rural Water Association (GRWA) and City of Brooklet personnel, and it has generated this plan as a living document that is reviewed periodically and updated as needed.

1. Introduction

This Source Water Protection Plan (SWPP) was prepared by the City of Brooklet Source Water Protection Committee and the GRWA for public drinking water sources in the City of Brooklet, Bulloch County Georgia.

The City of Brooklet has one drinking water system and as of the date of this report, it is supplied by two wells identified in the town's drinking water permit as source #101 and #102. Source well #101 (also known as well #1) and its treatment plant #201 are located in a fenced, cinder block building at the Brooklet Public Works facility (and adjacent to the Brooklet Police Department). Source well #102 (also known as well #2) and its treatment plant #202 are located in a fenced, cinder block at the intersection of Parker Avenue and Railroad Street. A new well is in the design phase and planned for drilling and installation during 2023-2024 along the south side of Hwy 80 north of town at the Brooklet First Baptist Church.

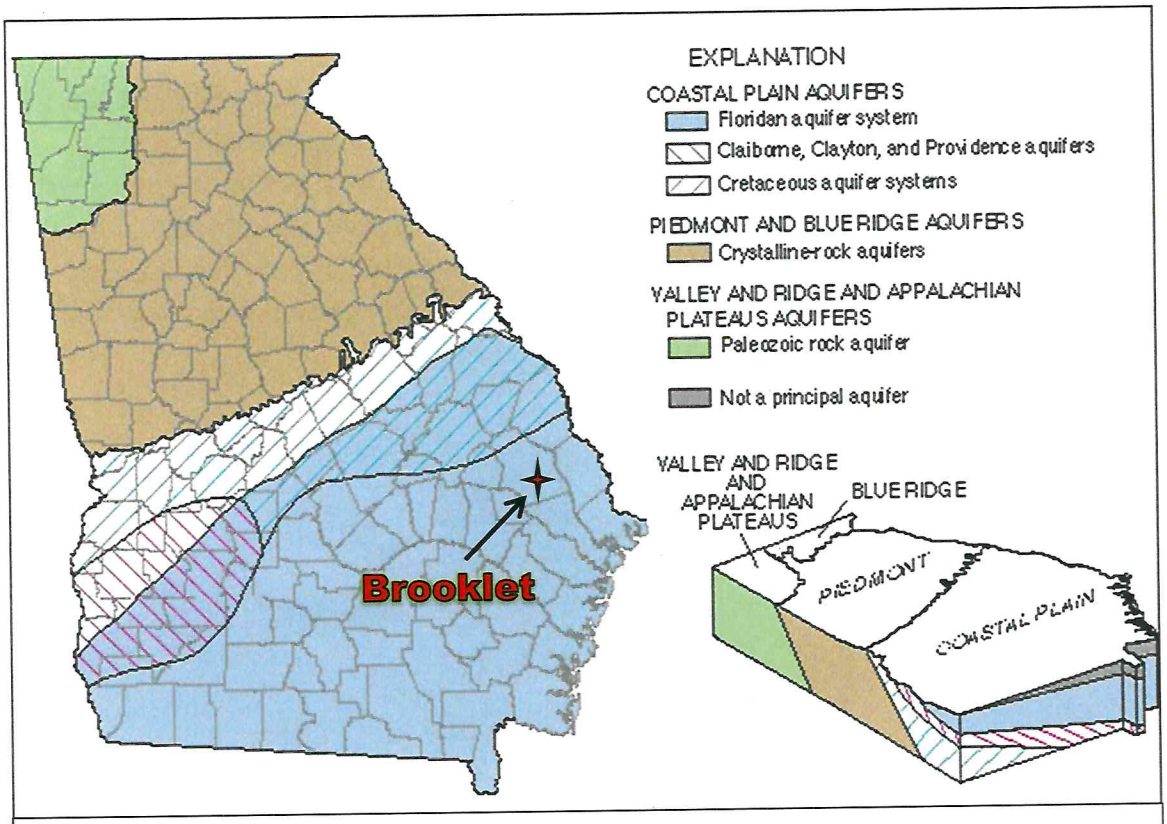
The purpose of this SWPP is to protect the quality of the City of Brooklet's drinking water by *proactively* preventing contamination or disruption of the drinking water sources. The SWPP is a working document that is intended to be routinely reviewed and updated to remain current and viable.

1.1 Source Protection Areas

The SWPP for the City of Brooklet has been completed in accordance with Georgia's Source Water Assessment and Protection Implementation Plan for Public Drinking Water Sources.

Brooklet is located in the Lower Ogeechee River Watershed which drains southeastward into the Atlantic Ocean. The general vicinity of Brooklet and southern Bulloch County is flat Surface runoff in the immediate Brooklet area drains west and south into Upper Black Creek, Black Creek and eventually enters the Ogeechee River approximately 22 miles southeast of town. Wells #101, #102, and the planned well are not located in the 100-year floodplain (1% probability) as designated on FEMA Flood Insurance Rate Maps of Brooklet (Appendix B).

Brooklet is also located in the Coastal Plain Physiographic Province of Georgia, an area of generally flat lying sedimentary formations that dip (slope) gently to the south and east. These formations are composed of carbonates (limestones and dolostones), sandstones, siltstones and clays that form the water-bearing zones and confining zones in the province.



Physiographic Provinces and Aquifers of Georgia

Two types of aquifers are present in the Georgia Coastal Plain, confined and unconfined aquifers. Confined aquifers are water-bearing formations, zones or layers underground that are overlain by an impermeable layer. This impermeable layer is typically a clay or silty clay layer that doesn't have enough interconnected pore spaces to allow water to move through. This layer prevents water at the surface from percolating down through the soil and reaching the aquifer underneath, much like a concrete driveway prevents water from passing through. For this reason, confined aquifers are relatively protected from localized contamination at or near the surface. Confined aquifers may be threatened:

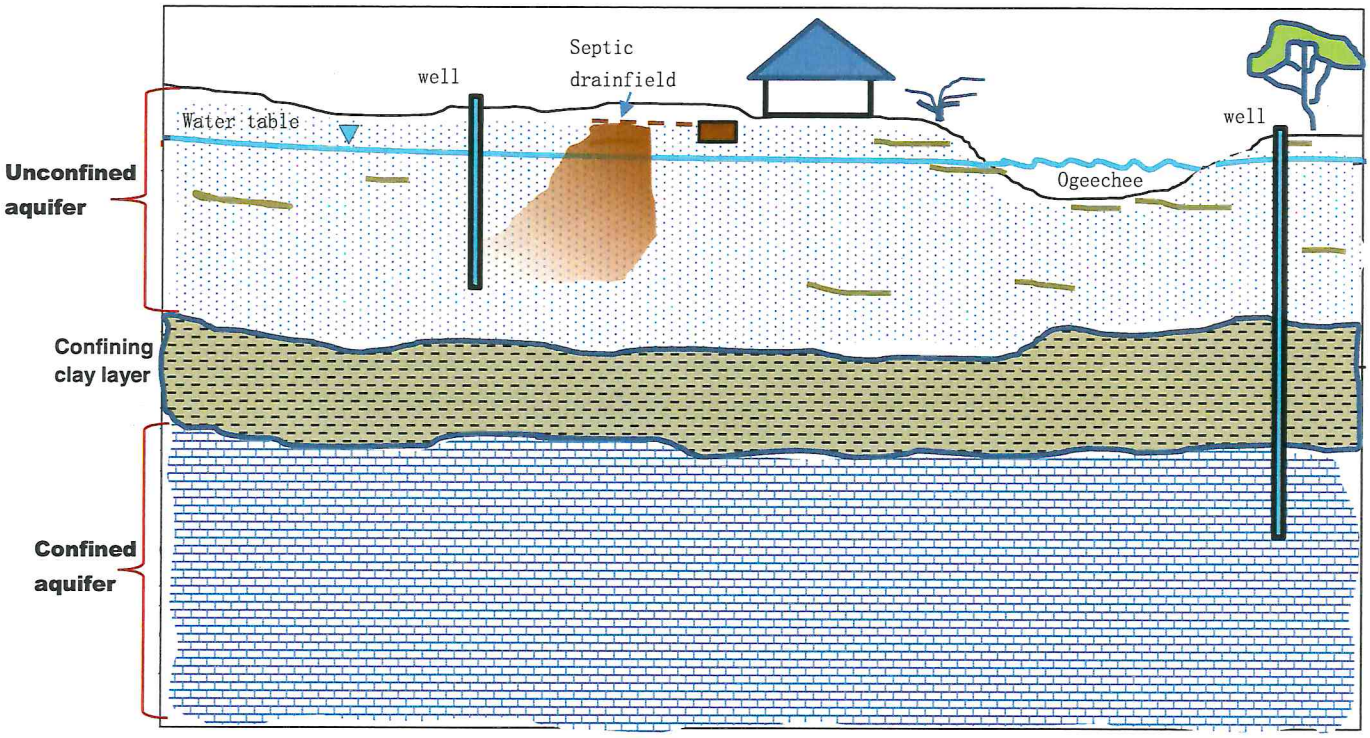
1 – where there is contamination at or near the area where the aquifer is exposed at or near the surface, also know as the 'recharge area' for that aquifer.

2 – where the confining clay layer(s) above the aquifer are very thin or not present locally due to geologic processes at the time the layer was being deposited.

3 - where there is an old, failed well with rusted casing allowing shallower, possibly contaminated groundwater to leak down inside the well to a deeper zone below the confining layer.

4 – where an improperly grouted well allows nearby surficial contamination to migrate down along the outside of the casing and be drawn into the well at depth.

Unconfined aquifers are recharged by surface water or rainfall that has infiltrated through the sandy, more permeable soils into the subsurface. In this type of aquifer there is no impermeable layer to prevent water from the surface from reaching an underground water-bearing zone, and water percolating down through any contaminating substance, whether on the surface or buried, can transport the contaminant down into the water bearing zone (aquifer). For that reason, unconfined aquifers are more easily contaminated than confined aquifers and that is why the EPD regulates them more closely.

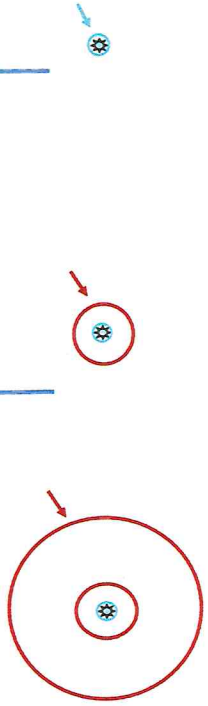


Wellhead protection areas for sources #101 and #102 have been identified previously in Brooklet's Well Head Protection Plan (WHPP). For drinking water systems utilizing wells in the Coastal Plain of Georgia as Brooklet does, EPD segregates wells drawing water from confined vs unconfined aquifers and determines an Inner management Zone (IMZ) for each well. For unconfined aquifers (less protected), EPD has also calculated an Outer Management Zone (OMZ). The OMZ of confined Coastal Plain aquifers is omitted because they are belived to have sufficient protection from surficial contaminants at distance from the well. EPD was unable to obtain detailed information on either well #101 (drilled 1929) or #102 (drilled mid-1950s) for the WHPP. The age of the wells and lack of construction information together raise enough question about their subsurface condition that **EPD designated both of Brooklet's municipal wells as unconfined coastal plain wells** in the

City's WHPP (Appendix B). These critically important control and management zones are detailed in the Well Susceptibility chart below and are shown on maps, pages 22 and 23.

Well Susceptibility

Assessment Area/Aquifer	*Outer Perimeter, Radial Distance From Well*	*Susceptibility Ranking*
Control Zone	25 ft. for pervious surfaces	Highest
All aquifers	**15 ft. for impervious surfaces**	
Inner Management Zone		
Confined	100 ft.	Medium
Unconfined		
-Karst	500 ft.	High
-Fractured Crystalline rock	250 ft.	High
-Unconsolidated Coastal Plain	**250 ft.**	**High**
Outer Management Zone		
Confined	N/A	Low
Unconfined		
-Karst	Determined by geologic mapping	Medium
-Fractured crystalline rock	Calculated (modified Health method)	Medium
-Unconsolidated Coastal Plain	**Calculated (volumetric flow equation)**	**Medium**



2. Potential Sources of Contamination

The WHPP generated by EPD identified located all known potential sources of chemical/biological contamination in both the IMZ and OMZ for the system. This SWPP elaborates on the origin of these potential sources of contamination and details ways in which the City of Brooklet can greatly reduce the chances of contamination or disruption of the sources supplying water to the water system.

3. Assessment of Threats

Most contaminating substances are unique to certain commercial or land uses. For example, if certain herbicides/insecticides used for weed control are detected in a drinking water sample, the compound detected would be expected to have originated from agricultural practices or weed/insect control in the vicinity of well #101 or #102. Similarly, petroleum compounds would most likely be contributed by the transportation support industry (active or

abandoned fuel stations, auto repair shops) or along a transportation corridor (vehicle accident on a road or railway). A local citizen improperly disposing of a petroleum compound or waste solvent (or some other hazardous compound) in the IMZ or OMZ could inadvertently contaminate the aquifer which in a worse case scenario, could cause one or both of the wells to be permanently removed from service. This is not an unknown occurrence in cities and towns of all sizes.

Increasingly, worldwide entities are disrupting both private and governmental infrastructure through the internet. Such cybersecurity threats have already intruded into water plants in the U.S., and some forms of *ransomware* have the potential to lock operators (or entire municipalities) out of their computer/drinking water/wastewater systems. Every drinking water system is vulnerable to contamination but implementing a SWPP is an extremely prudent way to reduce the chance of having a contaminated water source or a system damaged by a cyberware attack.

The following are the most likely to result in a sudden, large scale disruption or contamination event:

- Septic Systems & Waste Lagoons – Infiltration galleries for viruses, nitrates, chemicals and medicines
- Underground and above ground tanks – Petroleum or chemical leak
- Agricultural or Horticultural practices – Improper use of pesticides, herbicides, or fertilizers
- Roadway & Railroad vehicles – Both U.S. highway 80 and Parker Ave. extend through the town of Brooklet and both host traffic transporting petroleum compounds and farm/industrial chemicals. Accidents and spills along any of these roads could contaminate surface and groundwater in the area. It is also possible that source well #102 could be damaged from a vehicle due to its close proximity to Railroad Street.
- Security – A cybersecurity breach is increasingly likely to impact any water system. Regarding physical damage, casual vandalism is considered more likely than determined sabotage

Sections 3.1 – 3.15 highlight potential threats to the sources of the Brooklet Water System. The links below to USDA, EPA, and CISA web sites discuss in detail the latest information on these threats.

- USDA - Protection of Water Quality from Agricultural Sources. https://usdasearch.usda.gov/search?utf8=%E2%9C%93&affiliate=nrcs_portal&dc=null&query=groundwater+contamination&commit.x=0&commit.y=0

- EPA - Contamination
  https://www.epa.gov/sourcewaterprotection/inventory-potential-contaminant-sources

  https://www.epa.gov/environmental-topics/water-topics

  https://www.epa.gov/topics-epa-web

- EPA - Cybersecurity Best Practices for the Water Sector
  https://www.epa.gov/waterriskassessment/epa-cybersecurity-best-practices-water-sector

- CISA (Cybersecurity and Infrastructure Security Agency), Water and Wastewater Systems Sector
  https://www.cisa.gov/water-and-wastewater-systems-sector

3.1 ABANDONED CARS/VEHICLES

CAUSE FOR CONCERN
Abandoned cars and vehicles can potentially contaminate surface and groundwater with a variety of pollutants such as gasoline, battery acid, lead, diesel fuel, oil, brake fluid and antifreeze.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Pollution Prevention
- Source Reduction
- Management
- Disposal
- Education

Restoration
- Re-siting
- Remediation

3.2 ABANDONED WELLS

CAUSE FOR CONCERN
Abandoned water wells are potential pathways for contaminants to enter groundwater if the cover is not tight or the casing is leaky. The primary pathways into a well could be surface runoff or shallow groundwater entering the annular space of an improperly grouted well, infiltration of contaminated surface water in the general area of the well, or accidental/purposeful contamination through vandalism.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Health Regulations
- Design Standards
- Permit for Installation

Pollution Prevention
Education

3.3 AUTO REPAIR/BODY SHOP/SALVAGE YARDS

CAUSE FOR CONCERN
The potential contamination posed by facilities that repair automobiles (or careless DIY) is the same as posed by abandoned vehicles with the possible addition of solvents and degreasers. Potential contaminants include Arsenic, Barium, Benzene, Cadmium, Chlorobenzene, Copper, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, 1,4-Dichlorobenzene, P-Dichlorobenzene, Fluoride, 1,1,1-Trichloroethane or Methyl Chloroform, Dichloromethane or Methylene Chloride, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Xylene (Mixed Isomers), acids and lead from batteries.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
Critical Area Zoning
Buffers and Setbacks
Floodplain Management
BMPs
Infiltration Basins
Runoff Pond
Pollution Prevention
Source Reduction
Management
Disposal
Education
Health Regulations

3.4 AGRICULTURAL AREAS

CAUSE FOR CONCERN
Improper or unwise agricultural practices or applications of chemicals can potentially contribute Benzene, Herbicides, Pesticides, Lead, Nitrate, Nitrite, E-coli (over-application of manure), Turbidity. Homeowners using yard chemicals may not be aware of their possible influence on local drinking water.

- Nutrient Applications - Runoff or infiltration from improperly applied fertilizers such as phosphorus, nitrogen, potassium and other nutrients which are applied to enhance production. Improper/overapplication of manure can contribute E-coli or other bacteria/viruses to the watershed.

- Chemical Applications - Runoff or infiltration from improperly applied pesticides or herbicides. Some of these chemicals may eventually be ingested by fish and other organisms and can work their way up the food chain to humans through bioaccumulation.
- Irrigation – Improper or excessive irrigation can cause water quality problems from sediments, nutrients, pathogens, pesticides, and salts.
- No-till - Preferred over typical past farming practices such as tilling.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Critical Area Zoning
- Buffer and Setbacks

BMPs
- Nutrient Loading Standards
- Agricultural Management, Flushing and Dilution

Pollution Prevention
- Source Management
- Education
- Reduction

Health Regulations
- Contaminant Bans
- Use Controls

3.5 CEMETERIES

CAUSE FOR CONCERN

Cemeteries and graveyards can potentially contaminate groundwater. The decomposition of bodies can release nitrates and pathogens into the soil and shallow groundwater, and these can be further transported to deeper groundwater and possibly into any nearby well. Contamination can result from both the body itself, and from embalming chemicals and compounds containing arsenic and mercury which were used in the 1800s for embalming. Improper use of herbicides could also impact any nearby wells or karst watersheds.

The principal threats posed by cemeteries to drinking water wells are from Nitrates, Bacteria Viruses, Dalapon, Lindane, Arsenic, Formaldehyde, Methanol, Chloral hydrate, Phenol, Mercury, Glyphosate.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Siting
- Buffers and Setbacks

Restoration
- Re-siting

3.6 CYBERSECURITY THREATS

CAUSE FOR CONCERN

Internet-based threats to water and wastewater systems are increasingly common and have already impacted municipal water systems in the U.S. Cybersecurity threats may be ransomware that locks system operators out of a computer, denying access to operational control or regulatory records until a ransom is paid. Other cyberthreats could remotely take over control of water sources, treatment, or distribution operations.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Cybersecurity Plan
- Vulnerability Assessment
- Harden Cybersecurity Measures

Emergency Plan
- Short term planning
- Long term planning

3.7 DOMESTIC SEPTIC SYSTEMS

CAUSE FOR CONCERN

Cracked septic tanks or piping can leak untreated wastewaters to the groundwater and any interconnected surface water bodies. Clogged drain fields and tanks that are not pumped out regularly and can also cause septic tanks to overflow.

The principal threats posed by septic systems to drinking water wells or surface water intakes are from Nitrates, Bacteria and Viruses. If a septic system has been used for disposal of compounds/substances other than human waste or wash water, the system could potentially contaminate a source well or watershed with any substance put into the septic system.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Siting
- Overlay Districts
- Floodplain Management
- Critical Area Zoning

Health Regulations
- Design Standards
- On-site Sewage Management Controls

Building Codes
- Building Limitations

Subdivision Regulations
- Site Design
- On-site Wastewater Controls

Restoration
- Remediation

3.8 NON-DOMESTIC SEPTIC SYSTEMS

CAUSE FOR CONCERN

Non-Domestic Septic Systems are underground septic systems receiving industrial process water or other non-domestic wastewater. Such systems can potentially contribute a wide variety of contaminants to groundwater, depending on the type of facility, and in Georgia must receive an Underground Injection Control Operating Permit from EPD.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Health Regulations
- Contaminant Bans and Use Controls
- Well Requirements
- Well Closures

Zoning
- Critical Area Zoning
- Floodplain Management
- Buffers and Setbacks

Restoration
- Remediation

Pollution Prevention
- Source Reduction
- Management
- Disposal
- Education

Emergency Response Planning

3.9 ELECTRICAL TRANSFORMERS

CAUSE FOR CONCERN

Electrical transformers can leak and release polychlorinated biphenyls (PCBs), a family of persistent organic chemicals with known health effects, as well as other pollutants. If leaked into a watershed, PCBs can contaminate fish stocks in lakes. The higher-chlorine PCB compounds are notoriously slow to degrade and can bind to sediments and persist in an aquifer/ lake/stream/watershed for many years.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Pollution Prevention
- Management
- Disposal
- Education

Health Regulations
- Contaminant Ban and Use Controls

3.10 STORM WATER RUNOFF/INFILTRATION

CAUSE FOR CONCERN

Transportation and built-up areas have an excessive number of impervious surfaces including pavement on roads, sidewalks, driveways and parking lots, rooftops of buildings and other structures, as well as dirt parking lots and sports fields with compacted soils. During storms, rainwater flows across these impervious surfaces and transports contaminants (if present) to lower elevations and water bodies. This runoff water will both enter streams and recharge local groundwater, so it is possible for it to contaminate the groundwater in the area. This would be especially applicable for unconfined aquifers.

Storm water infiltration basins and injection into wells can potentially contribute Atrazine, Alachlor, Bacteria, Viruses, Cryptosporidium, Carbofuran, Chlorine, Diquat, Dalapon, *Giardia Lambia*, Glyphosate, Dichloromethane or Methylene Chloride, Nitrate, Nitrite, Nitrosamine, Oxamyl (Vydate), Phosphates, Picloram, Simazine, Trichloroethylene (TCE), Turbidity, Vinyl Chloride, Petroleum, automotive fluids, animal wastes and any other pollutants that are deposited on the surface.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Critical Area Zoning
- Floodplain Management
- Buffers and Setbacks
- Overlay Districts
- Impact Fees
- Development Agreements

Subdivision Regulations
- Site Design
- Erosion and Sedimentation Control

Building Codes
- Porous Pavement
- Impervious Surface Limitations
- Excavation, Grading and Seeding
- Phased Development

BMPs
- Grass Swales
- Infiltration Basins
- Runoff Ponds

Pollution Prevention
- Source Reduction
- Management
- Education

Health Regulations
- Design Standards
- On-site Sewage Management Controls

Stormwater Management
- Intergovernmental Coordination
- Stormwater Infiltration Facilities

3.11 TRANSPORTATION CORRIDORS

CAUSE FOR CONCERN

Transportation corridors are combinations of roads and/or railroads that includes both the paved, impervious surfaces used for roadways and also any green space or rights-of-way around the roadways or rail lines. A single, large-scale accident or repeated de minimis (small scale) losses of substances being transported could possibly contaminate groundwater in the vicinity of source #101 or #102. Additionally, herbicides and fertilizers are commonly used on rights-of-way and green spaces along transportation corridors and if incorrectly applied, these herbicides and fertilizers could enter local streams or infiltrate into the ground and contaminate the underlying aquifer.

Activities related to transportation corridors can potentially contaminate a water supply with Dalapon, Glyphosate, Picloram, Simazine, Sodium, Sodium Chloride, Turbidity, Acids, Bases, Nitrates, and **any chemical or substance that is transported by rail or road.**

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Health Regulations
- Contaminant Bans and Use Controls

Zoning
- Critical Area Zoning
- Overlay Districts
- Floodplain Management
- Siting of Highway and Road Locations
- Buffers and Setbacks

Subdivision Regulations
- Site Design
- Sediment and Erosion Control

BMPs
- Grass Swales
- Infiltration Basins
- Runoff Ponds and Wetlands

Building Codes
- Excavation, Grading and Seeding

Stormwater Management
- Intergovernmental Coordination and Agreements
- Infiltration Facilities

Emergency Response Planning

3.12 UNDERGROUND & ABOVE GROUND STORAGE TANKS

CAUSE FOR CONCERN

Underground storage tanks include tanks and any connected underground piping that have at least ten (10) percent of their combined volume underground. All other tanks are considered above ground. Storage tanks typically contain either petroleum or hazardous substances as identified by either the Resource Conservation and Recovery Act (RCRA), or the

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA as amended). Even some non-hazardous substances could negatively impact a source well or a downstream surface water body.

Many underground storage tanks are located at fueling stations for vehicles, but can also be found at farms, airports, school bus barns, cotton gins, automotive repair shops, industrial plants, and other facilities.

Most releases from storage tanks are a result of the corrosion of parts, improper installation, failure of piping systems, poorly conducted fuel or supply deliveries – particularly spills and overfills, and improper operation and maintenance. Once in the soil, these releases can move rapidly and threaten drinking water supplies.

Potential contaminants from underground storage tanks include Arsenic, Barium, Benzene, Cadmium, 1,4-Dichlorobenzene or P-Dichlorobenzene, cis 1,2-Dichloroethylene, trans 1,2-Dichloroethylene, Dichloromethane or Methylene Chloride, Lead, Tetrachloroethylene or Perchlorethylene (Perc), Trichloroethylene (TCE), Xylenes, and other petroleum products.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Critical Area Zoning
- Floodplain Management
- Buffers and Setbacks

Health Regulations
- Contaminant Ban and Use Control
- Underground Tank Requirements

Pollution Prevention
- Source Reduction
- Management
- Disposal
- Education

Restoration
- Re-siting and Remediation

Emergency Response Plan

3.13 UTILITY POLES

CAUSE FOR CONCERN

Wooden utility poles have been linked with the release of various chemicals used to preserve wood. These chemicals have known health effects. Additionally, the area around the bases of utility poles are sometimes sprayed with herbicides.

Potential contaminants from utility poles include Arsenic, Chromium, Copper, Creosote, Pentachlorophenol, Glyphosate

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Pollution Prevention
- Source Reduction
- Management
- Disposal
- Education

Zoning
- Buffers and Setbacks

3.14 VEHICLE PARKING AREAS

CAUSE FOR CONCERN
Vehicle parking areas can potentially contaminate surface water and groundwater with a variety of pollutants such as gasoline, diesel fuel, oil, and antifreeze.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Subdivision Requirements
- Site Design

Building Codes
- Impervious Surface Limits
- Porous Paving

BMPs
- Grass Swales
- Infiltration Basins

Stormwater Management
- Stormwater Infiltration Facilities

3.15 WASTE LAGOONS / WASTE PILES

CAUSE FOR CONCERN
Waste lagoons and piles can potentially contribute a wide variety of contaminants to surface and groundwater through runoff and infiltration. Any liquid substance placed in a lagoon has a potential to leach into the subsurface.

LOCAL TOOLS TO HELP ADDRESS POTENTIAL THREATS (*Detailed in Appendix A*)

Zoning
- Buffers and Setbacks

Pollution Prevention
- Source reduction
- Management
- Education

Restoration
- Re-siting
- Remediation

4. Management Plan

The circular protection areas shown in this SWPP are the same areas shown in the City of Brooklet's WHPP. In order to reduce the potential risk of contamination to the public's drinking water sources, the City of Brooklet's Source Water Protection Committee will work with the community to implement the management measures discussed below.

4.1 Conduct an Education and Outreach Campaign

Most homeowners and business owners will work to protect their local water supplies if they know how to minimize contamination risks. The City of Brooklet education and outreach campaign should include, but not necessarily be limited to, the following steps:

1. Provide educational information to residents and business owners. This information could be available at Brooklet City Hall or library, festival booths, Post Office, or included with water bills.

2. Hold a used oil or hazardous waste collection day in the city.

3. Coordinate with the Bulloch County Landfill on an "amnesty" day and let citicens know they can take their used motor oil to the county landfill that day

4.2 Develop a Best Management Practices (BMP) Program

The committee should develop a Best Management Practice (BMP) Inspection/Survey Program for businesses that use regulated substances. BMP's are guidelines for the storage and handling of hazardous materials, whether domestic, industrial, or agricultural in nature. BMP Survey programs can be either voluntary or mandatory. The local USDA office in Statesboro can provide details of agricultural BMPs.

4.3 Drinking Water Source Protection Area Signs

Post drinking water source signs at road accesses to the City of Brooklet's IMZs where appropriate, alerting travelers and citizens about the presence of the protection area and how to notify emergency personnel if a contamination event should occur.

4.4 Form a Source Water Protection Steering Committee

A Steering Committee can implement the SWPP and monitor the drinking water management zones. This will make it easier to maintain the purpose of the SWPP, which is to PREVENT contamination or disruption before it occurs. The committee should meet regularly, possibly once a year to review and if necessary, update the plan.

Source Water Protection Steering Committee

Joe Grooms III	Mayor of Brooklet
Darrell Smith	Brooklet Public Works
Steve Walker	Georgia Rural Water Association

5. Contingency Plan

5.1 Emergency Response

If an emergency such as a spill or other contamination/cybersecurity event occurs within a management zoneof a city well, the following people/agencies should be notified in order of priority:

Darrell Smith (Public Utilities Manager)	(912) 531-4726
Joe Grooms III (Mayor of Brooklet)	(912) 486-0280
Ted Wynn (Bulloch County Emergency Management)	(912) 764-6188 or 911
EPD Emergency Response	(800) 241-4113

Water personnel should determine if the Brooklet drinking water system has been or will be impacted by the contaminating event (spill) or disrupting event (cyber intrusion, drought, physical damage). If a well is potentially impacted, that well should be removed from service. If all wells are impacted the town should contact EPD, Bulloch County EMS and begin supplying Brooklet residents with bottled water or trucked water for drinking and washing until other sources can be secured. Parker Engineering has generated a Water Conservation and Drought Contingency Plan for Brooklet that details additional measures the city can take in an emergency (Appendix B)

5.2 Notification of System Users

If the Brooklet's public drinking water sources should become contaminated/disrupted and for some reason, Brooklet personnel will notify the water system users by one or more of the following methods:

1. Hand deliver a notice to each water system user
2. Post a notice at the bill paying office (Brooklet City Hall)
3. Post a notice at the Brooklet Post Office

4. Place a notification on the city's Facebook page, web site, or local newspaper
5. Broadcast an announcement on a local radio station, and on the local cable access channel.

5.3 Short Term Contingency Options

Short-term response to either a quality or quantity issue will require one or a combination of the following options depending on the specific nature of the outage:

1. Issue a boil water notice and/or recommend/supply bottled water to be utilized for drinking water purposes.
2. Truck and deliver water from an approved source.
3. Request that water system users conserve available water.
4. Source treatment/flushing

To conserve water, restrictions may also be placed on the use of water for anything but consumptive use and personal hygiene. Brooklet should review the Contingency Plan generated by Parker Engineering. The Contingency Plan is kept on file at City Hall and is included in Appendix B of this report.

5.4 Long Term Contingency Options

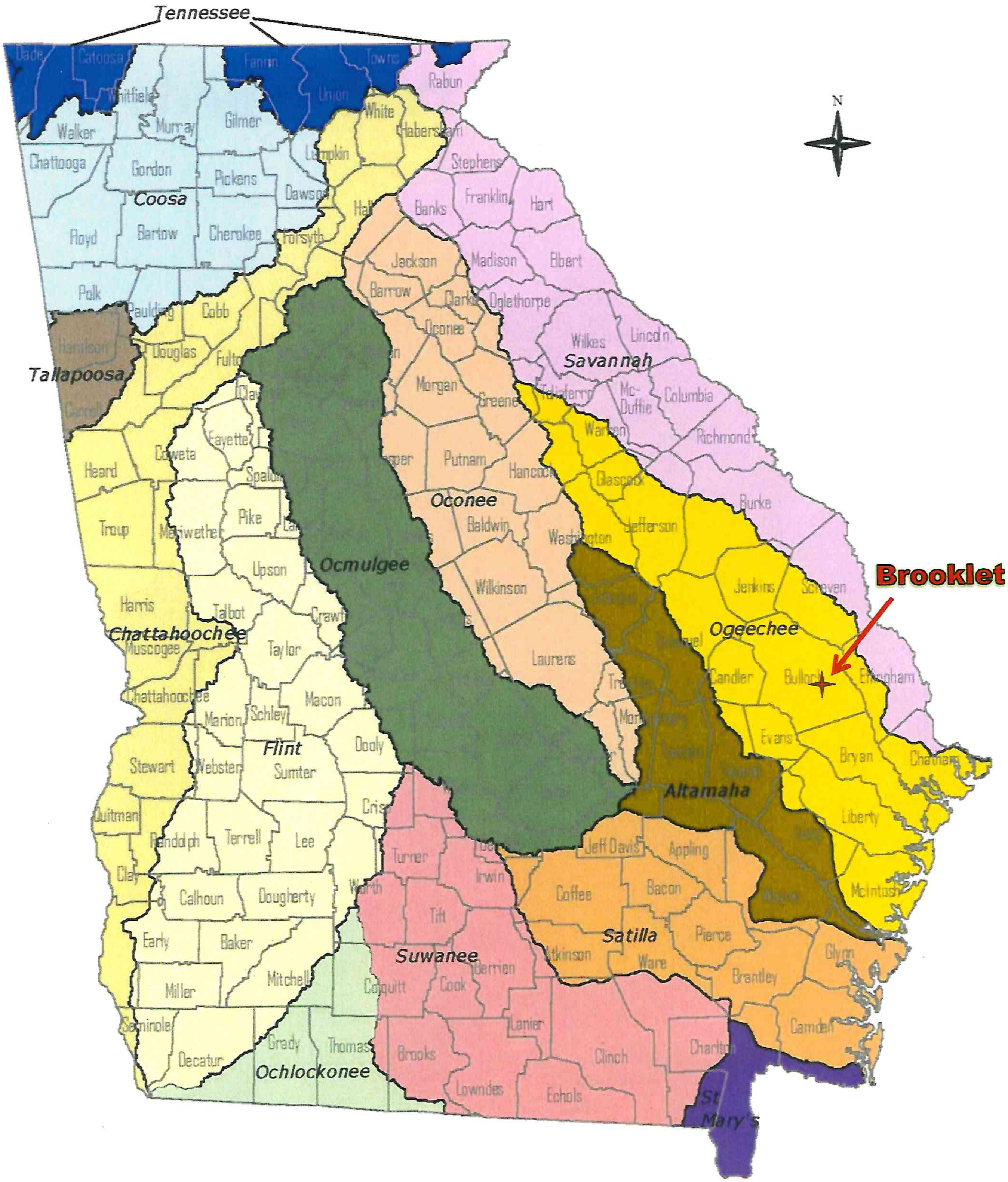
If a single source well is inoperable for whatever reason, the remaining unaffected well(s) will be utilized for water supply. If a major water outage reduces the ability of Brooklet to meet the demands of the water system, City officials should coordinate with the EPD.

5.5 Water System Emergency Shut Down Contacts

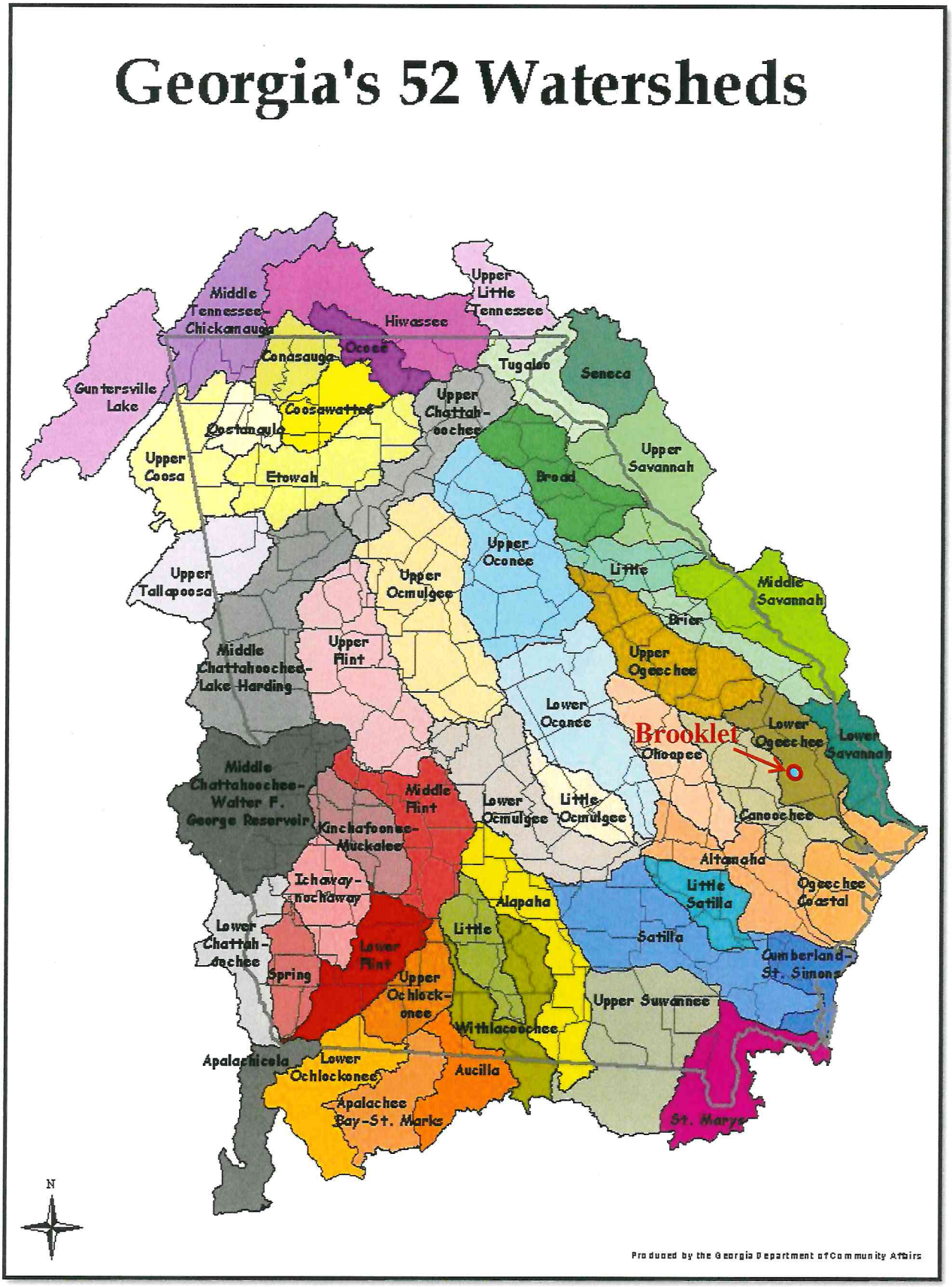
If one of Brooklet's sources must be shut down for an emergency situation, the system personnel should notify the following people in order of priority:

Public Utilities Manager (currently Mr. Darrell Smith)	478-206-7339
Drinking Water Technician (currently Mr. Johnny Alamia)	770-893-8610
Mayor for the City of Brooklet (Honorable Joe Grooms III)	912-486-0280
City Councilperson (Mr. Niki Gwinnett)	912-682-4084
EPD Augusta	706-667-4343

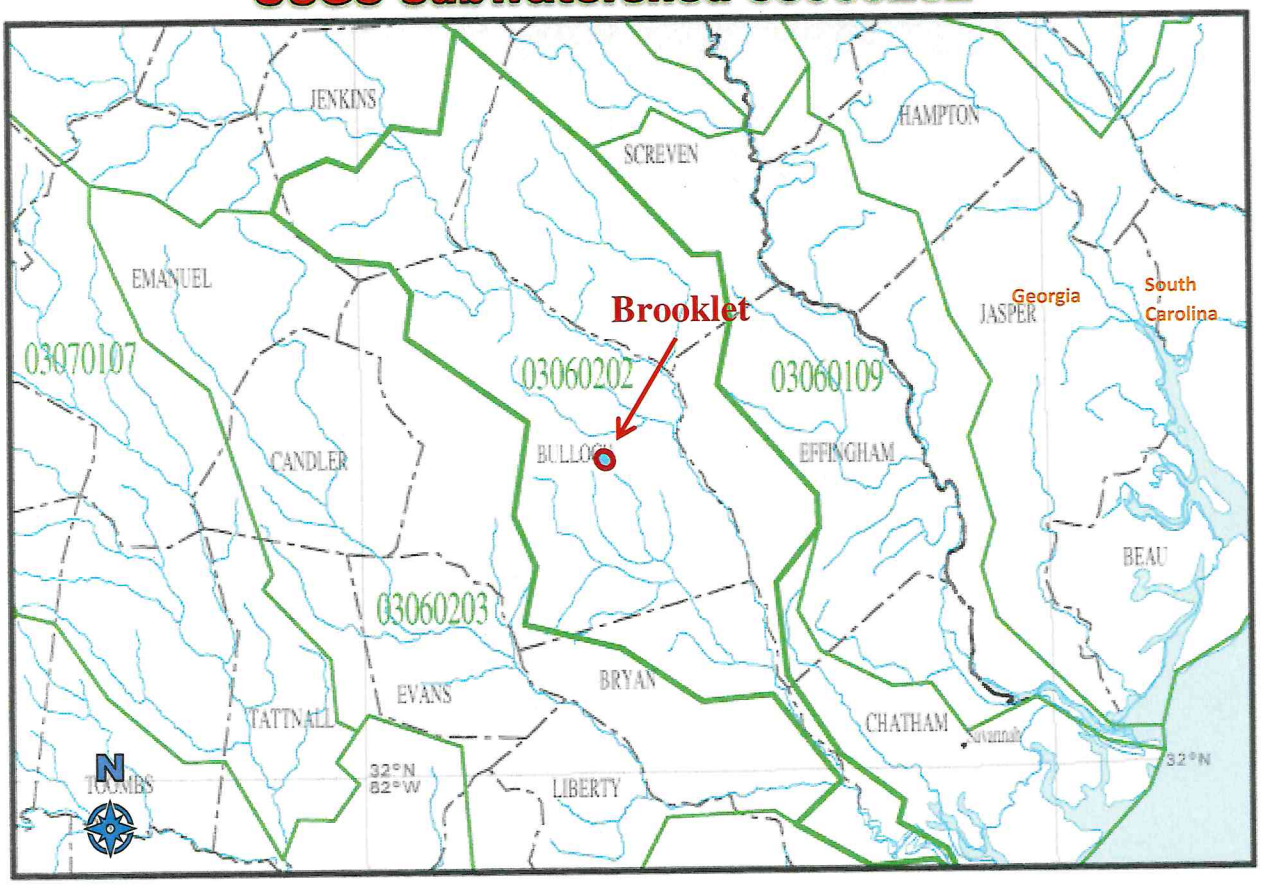
If the Mayor is not available, a City Council member should be notified and depending on the nature of the problem, EPD may need to be contacted at their emergency contact number **800-241-4113.**


Tennessee
N
Brooklet
Coosa
Tallapoosa
Chattahoochee
Flint
Ocmulgee
Oconee
Savannah
Ogeechee
Altamaha
Satilla
Suwanee
Ochlockonee
St Mary's
Dade
Catoosa
Fannin
Towns
Rabun
Whitfield
Union
White
Walker
Murray
Gilmer
Habersham
Chattooga
Gordon
Pickens
Lumpkin
Stephens
Dawson
Franklin
Hart
Banks
Floyd
Bartow
Cherokee
Forsyth
Hall
Jackson
Madison
Elbert
Polk
Paulding
Cobb
Barrow
Clarke
Oglethorpe
Oconee
Wilkes
Lincoln
Douglas
Morgan
Greene
Columbia
Fayette
McDuffie
Warren
Richmond
Coweta
Heard
Putnam
Hancock
Glascock
Burke
Troup
Meriwether
Pike
Baldwin
Washington
Jefferson
Upson
Wilkinson
Jenkins
Screven
Harris
Talbot
Taylor
Muscogee
Laurens
Candler
Bulloch
Effingham
Chattahoochee
Macon
Marion
Schley
Evans
Stewart
Webster
Sumter
Dooly
Bryan
Chatham
Quitman
Randolph
Terrell
Lee
Liberty
Clay
Calhoun
Dougherty
Turner
Irwin
Jeff Davis
Appling
Coffee
Bacon
McIntosh
Early
Baker
Tift
Pierce
Ware
Glynn
Miller
Mitchell
Colquitt
Cook
Berrien
Brantley
Seminole
Grady
Thomas
Lanier
Camden
Decatur
Brooks
Clinch
Charlton
Lowndes
Echols

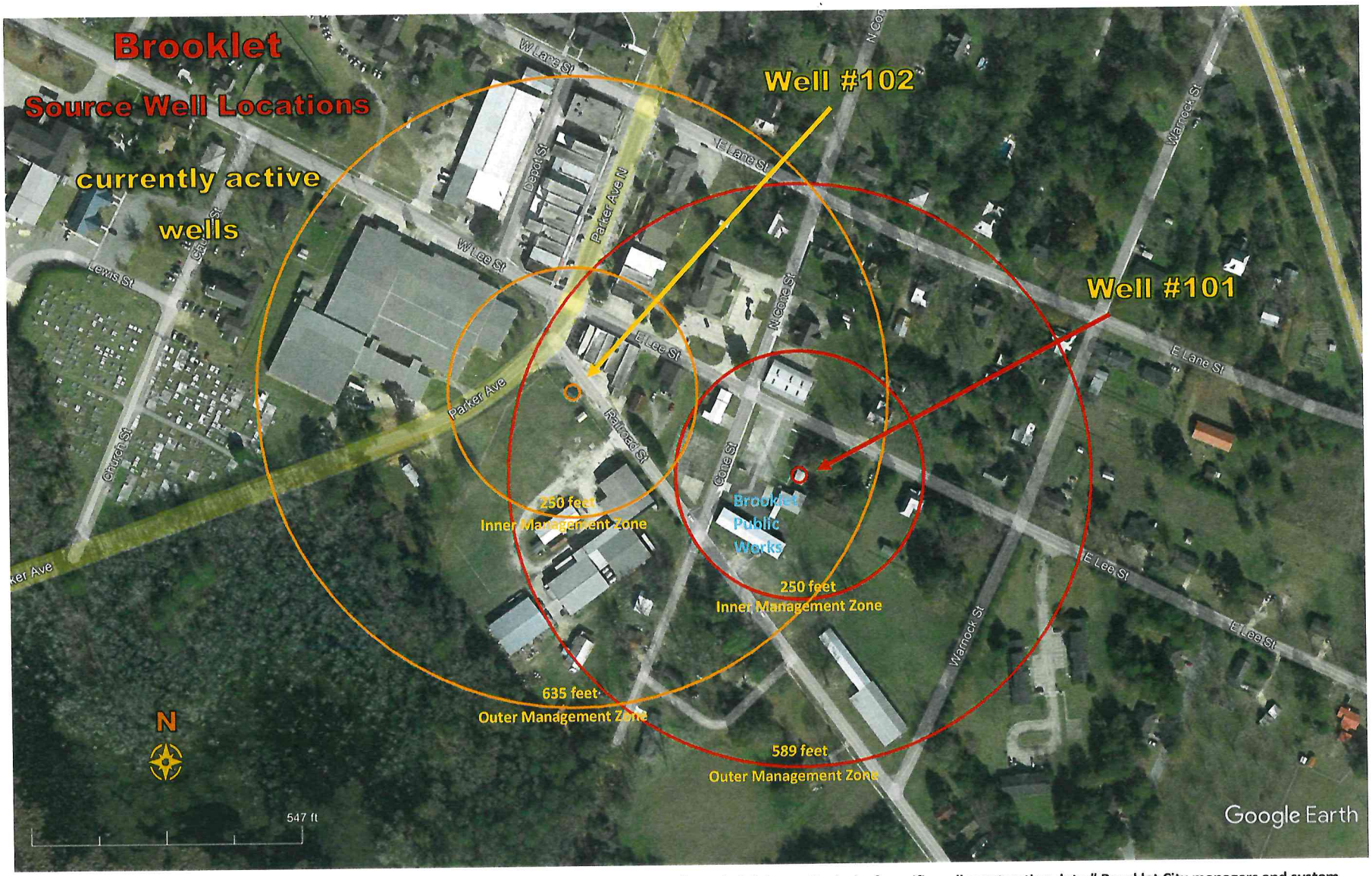
Georgia's 52 Watersheds



USGS Subwatershed 03060202




Brooklet
Source Well Locations
Location of new
municipal well
Well #101
Well #102
Upper Black Creek
Parker Ave
Parker Ave N
Brooklet
N
3371 ft
Google Earth



The EPD Wellhead Protection Plan designated wells #101 & #102 as "....unconfined Coastal Plain (open hole) due to the lack of specific well construction data." Brooklet City managers and system operators can use his designation and other information in this SWPP to provides additional protection for the drinking water system.

City of Brooklet

Source #101

Source of Water: Groundwater, Upper Floridan

Date Drilled: 1929

Water Source Location

Latitude: *32° 22' 43.00" N*

Longitude: *-81° 39' 42.70" W*

Well Location Description: Fenced enclosure at Brooklet Public Works.

Aquifer Type: Unconfined Coastal Plain

Control Zone: 15 foot radius

Inner Management Zone : standard (fixed) 250 ft. radius

Outer Management Zone: Determined by well charateristics and volumetric flow equation

Population : 1,456 residents (system) [*information from gadrinkingwater web site*]

Water Users # of Households Served: 560 (system)

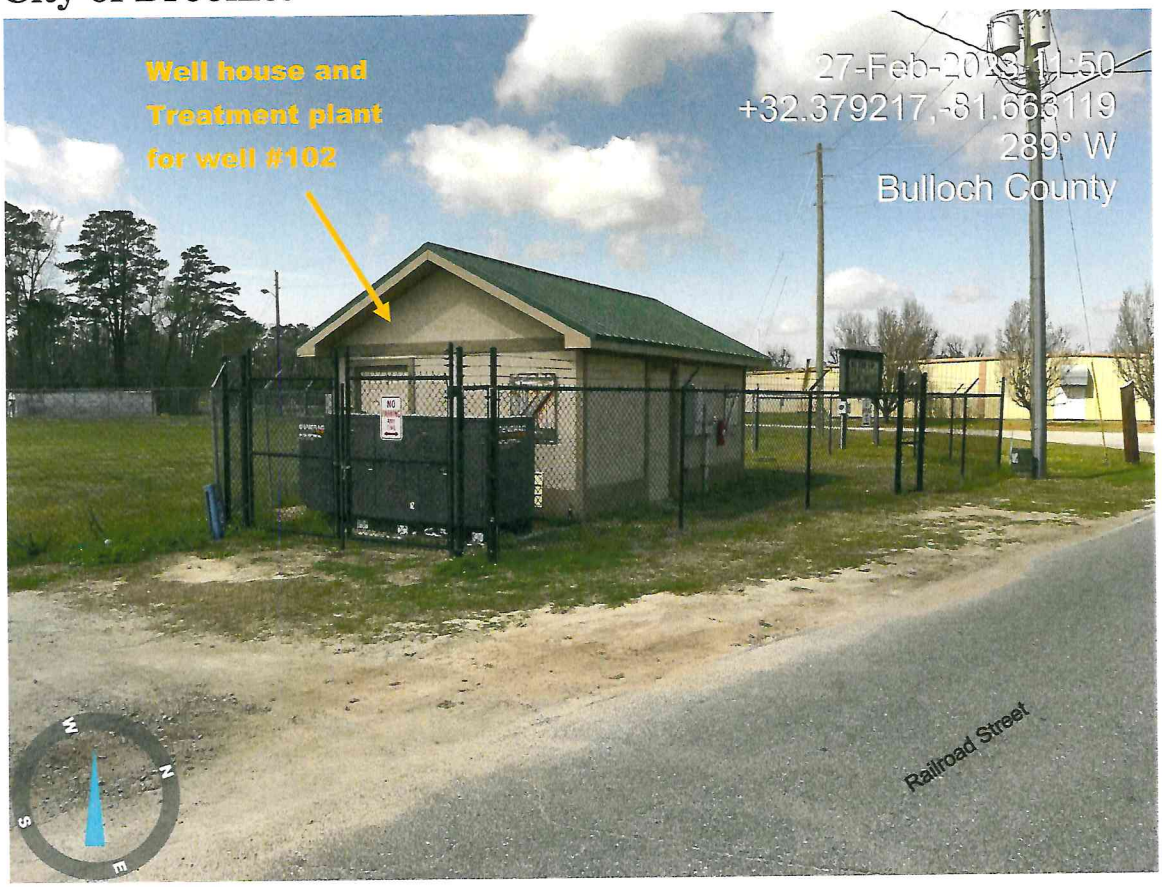
Water Supply Capacity [*information from water records for 2022 at Brooklet City Hall*]

Average Gallons Supplied/Day**: 95,944 GPD**

Average Gallons Supplied/Year: **35 MG** ***(91 % of total)***

City of Brooklet

Source #102



Source of Water: Groundwater, Upper Floridan

Date Drilled: mid-1950s [*information from Public Utilities Manager 2/27/2023*]

Water Source Location

Latitude*: 32° 22' 45.00" N*

Longitude: *-81° 39' 48.00" W*

Well Location Description: Fenced enclosure at Parker Ave. & Railroad Street

Aquifer Type: Unconfined Coastal Plain

Control Zone: 15 foot radius

Inner Management Zone : standard (fixed) 250 ft. radius

Outer Management Zone: Determined by well charateristics and volumetric flow equation

Population : 1,456 residents (system) [*information from gadrinkingwater web site*]

Water Users # of Households Served: 560 (system)

Water Supply Capacity [*information from water records for 2022 at Brooklet City Hall*]

Average Gallons Supplied/Day**: 9,323 GPD**

Average Gallons Supplied/Year: **3.4 MG** ***(9 % of total)***

Appendix A

Best Management Practices

Building Codes

Building Permit Limitations. Building permit limitations are quotas on the number of permits issued in a specified time period or within a specified geographic area to limit the type, timing, distribution, or total amount of new construction. Such limitations are most commonly used to ensure that development and infrastructure expansion occur simultaneously.

Impervious Surface Limitations. Impervious surface building codes control the proportion of a building site that can be covered in nonporous roads, roofs, parking lots, driveways, sidewalks, and other pavements without capturing and/or treating the runoff. This code limits the generation of runoff and the pollutants it carries at the source, while allowing development of any type and intensity to occur.

Porous Pavement. Porous pavement codes require the use of specific materials such as permeable asphalt, concrete, and crushed stone or gravel; open-celled pavers such as concrete or plastic grids with voids that are filled with topsoil and seeded or filled with porous aggregate; grass; paving stones; and wood mulch. These materials can be used for street pavements, driveways, parking lots, sidewalks, bike and footpaths, pedestrian plazas, and courts where appropriate to increase the capture, infiltration, and treatment of runoff through the underlying soil

Excavation, Grading and Seeding. Excavation, grading, and seeding codes can also affect the amount and quality of surface runoff that leaves a site during and after construction. Due the fact that grading can significantly degrade hydrology downstream of a construction site, regualting such activities can serve to decrease the impact of development as well as preserve natural covers such as natural wooded areas.

Phased Development. Phased development codes can be adopted to affect the timing of land-disturbing activities on a building site. This protection measure requires that construction be completed to a stage where exposed land is stabilized before another section of the site is placed under construction. By minimizing the amount of exposed land to that under active construction, runoff can be diminished and controlled by vegetative cover.

BMPs

Grass Swales. Grass or vegetated drainage swales are open and non-erosive conveyance systems that replace gutters, drainage pipes, and paved channels to carry, treat, and facilitate infiltration of runoff from storm events or snowmelt. While runoff passes through the grass swales, the particulates it carries have a chance to settle out, some of the water percolates into the ground, and to a lesser extent, some of the contaminants are removed by the turbulent flow.

Infiltration Basins. Infiltration basins are a system of shallow ponds connected by grass or vegetated drainage swales. The gradient of the swales and the elevation of the ponds are constructed to control the runoff flow velocity to permit continuous ponding along the length of the infiltration system. However, the ponding is intended to be for a temporary duration of about

24 hours so that runoff is absorbed into the soil along the length of the system. Because the infiltration system is designed to be non-erosive, to treat runoff contaminants, and to absorb the water, the swales and basins are effective at protecting source water from runoff.

Runoff Ponds / Wetlands. Runoff ponds and constructed wetlands are larger and deeper than shallow infiltration basins. They can act as a pretreatment system that allows the settling and filtration of runoff. These systems are particularly useful in controlling peak flows during large, rare storm events. In addition, they are also useful if the topography does not permit the vegetated swale and shallow ponding system. If the low velocity of the infiltration system cannot be met, numerous check dams of earth, wood, or stone can help slow runoff to storm water ponds and constructed wetlands and improve treatment performance.

Cybersecurity Plan

Vulnerability Assessment. The U.S. EPA has a cyber vulnerability assessment tool "VSAT web 2.0" which helps drinking water and wastewater systems through an all-hazards risk assessment, including cybersecurity threats. Costs and benefits are also assessed to protective measures. Additionally, EPA has a Water Resilience Tabletop Exercise (TTX) Tool that provides drinking water and wastewater systems the ability to plan, conduct, and evaluate contamination and cybersecurity events. The new Cybersecurity and Infrastructure Security Agency (CISA) offers scanning and testing services to help municipalities reduce their exposure to cyberthreats including vulnerability scanning, web application scanning, and phishing assessment. The CISA also can conduct a remote penetration test to simulate the tactics and techniques of cyber-criminals to identify weaknesses in a municipality's cybersecurity defense.

Harden Cybersecurity Measures. Where possible conduct these measures: use multi-factor authentication, use strong passwords, close unused internet connections, ensure anti-virus and firewalls are up to date, update software regularly, limit remote connections to SCADA systems, and conduct cybersecurity awareness training. Back up critical operational, regulatory, and billing records frequently.

Emergency Response Plan

The City of Brooklet needs to generate/update a Contingency (Emergency) Plan and keep it on file at City Hall. Water system personnel should review it annually to ensure it is kept up to date.

Short Term Planning. The emergency response plan should answer the "what if" type of questions that enable a water system to react thoughtfully to an emergency situation before it becomes a crisis. For example, the plan should outline responses to a series of questions related to emergency situations, such as, "What if a spill or leak caused a pool of contamination in close proximity to the municipal water well?" The following questions serve as a guide to developing proper emergency responses to that situation.

Has a *cybersecurity* incursion deactivated a well, water treatment, distribution or record keeping?
Is one of Brooklet's wells threatened by a spill or adjacent development?
Is there an emergency response mechanism in place sufficient to contain the spill?
Should this system shut down the potentially affected intake or well?

Can this system provide an alternative and safe supply of water for a short period of time until the threat has passed?
Does this system have the funding to pay for water via a tank truck for a short period of time?
Is providing an alternative source of water an option?

Long Term Planning. In addition to planning for short-term emergencies, the emergency response plan should develop options to long-term or permanent contamination of the water supply source and disruption to the water supply service. In this case, where could a long-term alternative water supply source be located? For cybersecurity threats such as ransomware, make sure the critical operational, regulatory and billing records are backed-up regularly and frequently.

Health Regulations

Local Design Standards. Health regulations often establish design standards for potential contamination sources and require on-site inspection of construction and operation activities to ensure that they do not threaten water resources. Activities that are often subject to such requirements include: underground storage tanks, wells, septic tanks, and other on-site sewage disposal systems. In addition, groundwater monitoring may be required for developments that include these activities or that involve the handling, storage, or generation of hazardous materials.

Well Permits. Health regulations often require a permit for the installation of wells to ensure their proper placement and construction. Regulations may apply to specific types of wells (e.g., shallow wells for private use) or to well installation procedures to prevent surface-level contamination from reaching groundwater. EPD regulates the design of municipal and community drinking water wells, and issues permits for their use.

Contaminant Ban and Use Control. Because the national standards for drinking water were established under the Safe Drinking Water Act, the role of local health organizations in establishing contaminant-specific requirements was greatly reduced. However, local health organizations still have considerable leeway in addressing local health-related issues. If the local health officials determine that a threat to human health exists, they can take action. It is possible that contaminants for which an MCL has not been established could affect the local water supply. In such cases, the local government may adopt regulations specific to this source. For instance, if permitted by state law, health regulations could:

- restrict or regulate the use of certain potential contamination sources in source water protection areas and watersheds (e.g., chemical storage tanks, stock piles, septic tank cleaners); and/or
- establish requirements for handling toxic and hazardous materials within source water protection areas and watersheds to reduce the risk of spill-related contamination of water supplies.

Sewage System Permits. Sewage discharge permits often provide siting and design criteria and maintenance and monitoring requirements for small sewage treatment systems. Regulations may

also prohibit the use of on-site sewage management systems in cases where existing contaminant concentrations, such as nitrogen, pose a health risk.

Septic Tank Regulations. Septic tank regulations usually establish design and construction standards, require on-site inspection and percolation tests (to determine the absorption capacity of the soil at the site), establish density limitations on the number of septic tanks in an area, and set distance requirements between septic systems and wells and property lines. Local health regulations may also require that older septic systems be upgraded and that all systems be pumped regularly, such as every three to five years.

Pollution Prevention

Source Reduction. Contaminant source reduction is the most effective pollution prevention measure because potential contaminants are either not used or used at a reduced level. Examples of source reduction activities include education programs to help homeowners reduce the application of fertilizers and pesticides, the modification of industrial practices to use less or reuse toxic materials, and integrated pesticide management programs used on agricultural fields. *No-till* farming practices have very positive benefits for local surface water and groundwater.

Management of Contaminants. Management of contaminants and polluting behaviors may include protocols and practices for septic systems, storm water control, standards for storing hazardous substances, petroleum products, pesticides, and fertilizers, or programs to cap or plug abandoned wells.

Education. Education can stress pollution prevention as a part of source reduction, management, and disposal efforts. Education measures may involve a public information campaign focusing on storm drains, maintaining stream-side vegetative buffers, appropriate use of fertilizers and pesticides, auto and lawn mower engine maintenance, and household hazardous materials handling and disposal. Education may be coupled with technical assistance from Brooklet officials and GRWA personnel.

Restoration

Re-siting and Remediation: Regardless of the strategy, once a contaminating event has occurred the first step in restoration is to stop the impact of the activity or condition that impairs or threatens to contaminate the source water quality. This may involve rehabilitation of sites through clean ups. Restoration may require the re-siting or moving of certain facilities or operations because the characteristics of the contaminants that are used or stored there simply pose too great a risk. While perhaps not the easiest option, re-siting some facilities or land uses outside critical areas in the source water protection area may be the cheapest and best option for protecting the water source. Although land acquisition costs may be associated with re-siting, the long-term cost of instituting a highly technical and engineered solution in an attempt to restore contaminated area may be infeasible. Even if such an area does not contaminate a nearby drinking water source (well or intake), its mere presence would very likely cause the drinking water source to be removed from the drinking water permit by EPD.

Subdivision Regulations

Regulated Activities by Subdivision Requirements. In addition to identifying water supply and wastewater management options, traditional subdivision regulations often specify the following requirements.

- Site design, engineering, and construction requirements establish standards for streets, curbs, gutters, and other drainage structures and for the use of impervious surfaces to protect water resources on- and off-site.
- On-site wastewater and erosion and sedimentation control requirements can be stipulated in subdivision requirements.
- Dedicated area requirements for groundwater recharge or public amenities such as open space and parkland may also be established in subdivision requirements.

Subdivision Requirements for Source Water Protection. Many local governments are adopting subdivision ordinances to allow flexible development designs that are based on the natural features of the site, enabling the developer to protect stream corridors, wetlands, and other sensitive areas.

Stormwater Management

Storm water collection infrastructure and treatment facilities may be required by the Phase II NPDES permits. Depending on the degree of urbanization within a watershed, at least one watershed government may need to install, operate, and maintain storm drainage infrastructure and facilities. It only makes sense to consider runoff inputs from the entire watershed when designing these facilities.

Consistency in local government land use measures, erosion and sedimentation ordinances, and enforcement efforts throughout the watershed will be critical in order to succeed in watershed-wide source water protection. As most ordinances attempt to achieve similar results, consistency between local government ordinances may be a larger concern for the legal counsel than for the public or elected officials.

Zoning

A zoning ordinance is the basic legal instrument traditionally used by local governments to address land use matters. A zoning ordinance divides land into districts, allowing compatible land uses to exist in each district but separating incompatible uses from each other. It consists of a map showing the various districts that permit residential, commercial, industrial, agricultural, and other uses. The ordinance also includes a written portion that establishes the conditions under which land may be developed and used for particular purposes, such as the allowable size and height of structures, building density, setback requirements, and other conditions for each district. These conditions often include restrictions on the siting of specific facilities or activities that are potential sources of contamination. Potential contaminant sources that may merit siting restrictions include landfills; wastewater treatment plants; business concerns that store, use, or process hazardous material or contaminates or concern; and large concentrated animal feeding operations. Brooklet is in the process of generating a wellhead protection ordinance.

Overlay Districts establish areas where additional zoning restrictions apply that are superimposed on top of the underlying type of zoning. Land uses in overlay districts must then conform to the restrictions set for both zones. This approach can be used to identify and set additional protective measures for water supply watersheds, wellhead protection areas, floodplains, wetlands, and significant groundwater recharge areas.

Critical Area Zoning. Critical area zoning is similar to the use of overlay districts in that it imposes restrictions or requires review standards for developments in water supply watersheds, areas with steep slopes, floodplains, wellhead protection zones, significant groundwater recharge areas (such as the Inner Management zones and for Zones of High Vulnerability in KARST areas), and similar sensitive areas. It often allows for non-intensive uses such as some types of agriculture or recreation fields that preserve the water quality functions of the land (e.g., floodplains that filter water pollutants).

Buffer and Setback Zones. Buffer and setback zones, a specific type of critical area zoning, designate linear or circular areas of land along the edge of a stream, river, or reservoir upstream of a community water supply intake. They are important protection mechanisms since land use restrictions in the zones can reduce the adverse impacts of surface water runoff on drinking water sources. Buffers and setbacks provide water quality protection by filtering the over ground sheet flow of rain or snowmelt that transports contaminants from land to water supplies and provides greater opportunity for it to soak into the soil. Buffers and setbacks can also provide other functions, such as minimizing flooding, preserving wildlife habitat and corridors, maintaining stream bank integrity, protecting aquatic habitat, and providing recreation areas. The most effective buffers and setbacks are naturally vegetated and undisturbed strips of land 50 to 400 feet in width. Exact determination of the width is flexible, based on such factors as topography and slope, classification of the stream or water body, current and future land uses in the watershed, costs, and political realities.

Impact Fees. Impact fees allow for the collection of money from new development applicants based on a formula that calculates the impacts on the natural resources and local infrastructure caused by the new development. The fee structure is typically established in a local ordinance codified within the zoning ordinance. The local government can apply the assessed fees to offset the impacts on water quality by, for instance, installing storm water infrastructure or acquiring critical land in the source water protection area. This regulatory protection tool may require state enabling legislation that authorizes local governments to enact and assess impact fees.

Development Agreements. Development agreements are binding legal contracts, usually between a landowner/developer and the local government, that specify how the parties believe the development project should be accomplished. The parties to the agreement negotiate permit conditions in exchange for public benefits such as protection of source water resources. This tool may be most useful in large, lengthy developments in which it is beneficial for all concerned that stable and predictable development will occur. Nine states have chosen to establish criteria for the use of development agreements in state enabling legislation. On a less formalized basis, local governments frequently negotiate ad hoc agreements with developers, which identify development restrictions, public benefits, or amenities as conditions for permit approval.

Appendix B

Applicable Regulations, References and Ordinances

WATER CONSERVATION PLAN

AND

DROUGHT CONTINGENCY PLAN

FOR THE

CITY OF BROOKLET

Project #: PE17173

January 2018

Prepared by:

PARKER ENGINEERING
36 Courtland Street, Suite B
Statesboro, GA 30458
912-764-7722

INTRODUCTION

As the state of Georgia continues to grow, the Georgia Environmental Protection Division (EPD) has recognized the need to conserve the State's water resources. In response to this need they have directed the City of Brooklet to update their water conservation plan.

The City of Brooklet has obtained the services of Parker Engineering, LLC to update their current plan in accordance with the EPD document, titled, *"Contents of a Comprehensive Water Conservation Plan."* The EPD's Guidelines are included in the Appendix.

The following plan provides guidelines for the City to provide a safe and abundant supply of water for the future and also provides a contingency plan for droughts.

WATER CONSERVATION PLANNING

1. SYSTEM MANAGEMENT

A. 24 Month Estimate of Unaccounted for Water (UAW)

The unaccounted water rate for the 24 month period from December 2015 through November 2017 was 14.18%.

Unaccounted water was determined by subtracting the amount sold and flushed from the amount produced.

Amount produced = Meter Readings from Wells #1 & #2.
Amount sold = Summary from City Utility Billing Records
Amount flushed = 1,000,000 gallons per month (Based on typical flushing pattern.)

B. Inventory of Existing Facilities, Production Characteristics

The City of Brooklet has two groundwater wells which tap the Floridan Aquifer. In the period between December 2015 and November 2017, the city wells produced an average of approximately 152,000 gallons of water per day.

C. Per Capita Use of Water

The City of Brooklet has a population of 1523 people. The average daily use is 100 gallons of water per person.

2. IDENTIFICATION OF WATER CONSERVATION MEASURES

A. Review of Existing Conservation Measures

Leak Detection and Elimination: The water superintendent of the City inspects a portion of the water system every morning to check for leaks. Every part of the system is checked at least once per month. All broken lines and/or leaks are immediately repaired. The Utility Department keeps a well stocked inventory of pipes, fittings, saddles, repair sleeves, and repair kits in order to perform leak repair quickly and during after hours when material supply houses are closed.

Availability of Accurate Maps of the System: A set of as-built drawings of the distribution system is maintained and updated every 4 years by the City.

Meter Maintenance, Testing, Replacement, Calibration, etc:

Residential Meters

3/4" x 5/8" - Replaced after 1 million gallons of volume.

3/4" x 3/4" - Replaced after 1 million gallons of volume.

1" - Field tested every two years by Brooklet's Utility Department using a calibrated meter. Meter will be removed from service if accuracy limits are exceeded.

1-1/2" - Field tested every two years by Brooklet's Utility Department using a calibrated meter. Meter will be removed from service if accuracy limits are exceeded.

Commercial/Industrial Meters

3/4" x 5/8" - Replaced after 1 million gallons of volume.

3/4" x 3/4" - Replaced after 1 million gallons of volume.

1" - Field tested every two years by Brooklet's Utility Department using a calibrated meter. Meter will be removed from service if accuracy limits are exceeded.

1-1/2" - Field tested every two years by Brooklet's Utility Department using a calibrated meter. Meter will be removed from service if accuracy limits are exceeded.

2" through 8" – Field tested/recalibrated every year by an outside vendor at the customer's expense.

Prevention of Tank Overflows: Tanks are monitored daily to ensure that there are no overflows.

Flushing Programs: The City of Brooklet currently flushes the distribution system at least twice per year. The amount of water used is estimated and recorded. For estimating purposes, each hydrant was assumed to flow 100 gpm for 30 minutes.

Prevention of Unauthorized Water Use: No unauthorized use of unmetered water, such as fire hydrants and blowoffs are allowed. The police department questions anyone taking water from hydrants. All violators are prosecuted.

Proper Installation of Water Lines: All new water lines are pressure tested for leaks following AWWA standards and methods.

Recycling or Reuse of Treated Wastewater Within the System: The City does not treat their wastewater to reuse standards.

Upgrading Old Equipment with New Water-Efficient Equipment: The City of Brooklet recently upgraded to a handheld meter reading system. The City has

made water conservation a priority purchasing water efficient toilets, sinks, nozzles, and showers for City owned property.

Water Audit – The City of Brooklet tracks gallons of water produced, gallons of water sold and the approximate number of gallons of water flushed to determine the amount of unaccounted for water (UAW.) When UAW exceeds 15%, the City investigates for sources of leakage or unauthorized use.

Water Conservation Program – The City of Brooklet provides water conservation education materials and notices for water restrictions to water customers.

Conservation Rate Structure – The City of Brooklet currently has an increasing block type structure that encourages conservation by increasing the price of water for larger quantities of water used. The rate schedule is included in the appendix.

B. SELECTION CRITERIA

The City has a limited number of staff with limited resources. Therefore it prioritizes its conservation methods by performing informal cost benefit analyses. For example, if the UAW rate is 5% it would not be prudent to use resources to perform a leak detection survey city-wide.

C. BARRIERS THAT MIGHT AFFECT IMPLEMENTING PLANNED WATER CONSERVATION MEASURES

There are no known barriers to implementing the water conservation measures listed above. If the City shifted its focus from prevention (water audits, leak detection, meter calibration, education etc.) to enforcement, they would face

difficulty due to staff shortages required to effectively enforce conservation measures.

D. IDENTIFICATION OF OTHER WATER CONSERVATION EFFORTS OR MEASURES FOR FURTHER ANALYSIS

Sonic Leak Detection Program – The City could utilize a leak detection firm to use sonar to locate water leaks.

Plumbing Ordinance – The City could pass an ordinance requiring water conservation plumbing fixtures on all new construction.

Water Conservation Kits – As part of a water education campaign, kits for saving water could be distributed. For example: toilet dams, toilet leak detectors, shower retrofits, etc.

3. DROUGHT and EMERGENCY CONTINGENCY PLAN

A. System for Determining Drought Severity

The following conditions would prompt the City of Brooklet to put its priority use system into effect:

Drought

a) Reaching 3.0 on the Palmer Drought Severity Index (NOAA) http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif
b) Water levels in aquifer dropping more than 10 feet.
c) Tanks unable to fill due to high water demand.

Emergencies

d) Loss of power to wells and pumps for more than 12 hours.

e) Water main breakage.

f) Empty tanks.

B. Potable Water Use Priorities

Higher Priority

1. Emergencies and Emergency Facilities
2. Hospitals and Health Clinics
3. Household Use
4. Industry and Commercial Use
5. Schools
6. Agriculture
7. Construction

Lower Priority

8. Irrigation
9. Swimming Pools
10. Car Washing
11. Street Cleaning, Line Flushing, Hydrant Testing, etc.

C. Restrictions on Lower Priority Uses

During Severe Drought (greater than 3.0 on Palmer Index).

Even/Odd Schedule. For example, customers with an "odd" street address may only use water on "odd" calendar days and customers with an "even" house address may only use water on "even" calendar days.

During Emergencies:

Total ban of lower priority uses.

4. IMPLEMENTATION OF WATER CONSERVATION MEASURES

All water conservation measures have already been implemented by the City of Brooklet. The City should consider the additional options discussed in Section 2D.

5. ANALYSIS OF BENEFITS AND COSTS

There are relatively few costs associated with implementing the conservation measures listed in this report. The costs incurred are largely due to extra record keeping required to track unaccounted water and to track water usage. The benefits of water conservation are as follows: savings for homeowners, savings due to lower production costs, lower sewage treatment costs, and savings due to delays in infrastructure improvements (sewer and water.) The benefits far outweigh the minimal costs required to conserve water.

6. EDUCATION EFFORTS

The following are goals for water conservation education for the next five years:

A. Perform 4 presentations per year to a school group, civic group or other organization based in Bulloch County.

B. Provide each new water service applicant a copy of AWWA Water Conservation Tips which include the following:

1. 6 things you can do to save water in the kitchen and laundry
2. 9 things you can do to save water in the bathroom
3. 10 things you can do to save water outside
4. Facts, figures and follies of water conservation
5. Public service announcement water conservation tip

C. Print in bold lettering on monthly water bills a message promoting water conservation.

D. Provide pamphlets on water conservation in City Hall.

7. PREPARATION OF DEMAND FORECAST

A. Description of methods of collecting current and future water demand data.

Current total demand was determined by taking a 24-month average of daily water produced at the City's two water sources. Current per capita demand was determined by dividing the total demand by the total current population.

Future population was determined by using the guideline *"Georgia 2030, Population Projections,"* produced by the Office and of Planning and Budget. The guideline provides data for Bulloch County but not the City of Brooklet. It was assumed that the City would grow at the same percentage rate as the County as a whole.

B. **Forecast of anticipated water demand for future time periods (20 years.)**

City of Brooklet Water Demand Estimates			
Year	Population Projection	Water Use Per Capita gpd	Projected Total Water Use gpd
2015	1457	300	437,100
2020	1625	300	487,500
2025	1815	300	544,500
2030	2011	300	603,300
2035	2212	300	663,600

D. **Adjustments to demand based on known and measurable factors.**

No adjustments are foreseen.

8. EVALUATION OF STRATEGY

A. **Provide schedule and review plan for updates and revisions to the water conservation plan.**

Milestone	Date
City Review of Plan	January 2018
City Approval of Plan	March 2018
Begin 5 Year Update of Plan	September 2022
Approve 5-Year Update of Plan	March 2023
Begin 10-Year Update of Plan	September 2027
Approve 10-Year Update of Plan	March 2028

B. **Provide certification of the conservation plan by the system's governing body.**

Certification by the Brooklet City Council will be added upon approval.

APPENDIX

1. Contents of a Comprehensive Water Conservation Plan

2. Water Rate Schedule

3. City Council Certification

APPENDIX 1.

CONTENTS OF A COMPREHENSIVE WATER CONSERVATION PLAN

WATER CONSERVATION PLAN

Water Conservation Overview:

The Georgia Board of Natural Resources has adopted revised Water Conservation Rules as amendments to the Rules for Water Quality Control and Rules for Groundwater Use in accordance with the requirements of Senate Bill 10 (SB 10), which was passed by the 1994 Georgia General Assembly. The Rules became effective on December 29, 1994.

As required by SB 10, the amendments to the Rules include revisions to the requirements pertaining to the content and submissions of water conservation plans by applicants for **new or increased water withdrawal permits (excluding agriculture)**. The following outline is provided to help the applicant develop an effective water conservation plan, which is based upon specific needs and conditions of the water system to which it applies.

The Water Conservation Rules have been written in general terms to allow water users flexibility in determining what programs are needed and would be cost effective for their purposes. Applicants must develop and implement effective water conservation programs in accordance with accepted standards and which address local water resource constraints, cost/benefit analysis, etc. In areas where the water resources are subject to the greatest impact by increasing water withdrawals, whether by industry use and/or population growth, water users should implement more aggressive, proactive water conservation programs. The following basic elements should be addressed in any water conservation program.

1. Water Loss: Reduce water loss and/or unaccounted for water (UAW) through enhanced system management programs such as meter installation, replacement and calibration; leak detection and repair; etc.

2. Water Demand Management: Establish programs to improve long-term efficiency of water use for this facility. Metering of all water usage is a basic component of any water conservation strategy. Compliance with plumbing code provisions requiring the use of ultra-low flow plumbing fixtures and the installation of other water saving technology are also desirable elements of a comprehensive conservation strategy. Where needed, more aggressive conservation measures may be practical such as greater use of recycling, replacement of insufficient water wasting equipment, etc. To be successful, employee education and involvement should also be included as high priority components of the water conservation plan.

3. Long Range Planning: Develop long term water demand projections (outlook covering twenty year time period) based on incorporating water conservation efforts as described for this facility.

The Water Conservation Plan also must contain the attached items (or contain a statement why the item is not an appropriate part of the plan).

CONTENTS OF A COMPREHENSIVE WATER CONSERVATION PLAN

In preparation of a permit application for a new or modification of an existing permit, which includes an increase in the permitted water use (except for a farm use permit application); the applicant must submit to the Director for approval a Water Conservation Plan in accordance with Chapter 391-3-2-.04 (11) of the Georgia Dept. of Natural Resources, Environmental Protection Division Groundwater Use Rule, and the United States Environmental Protection Agency Water Conservation Plan Guidelines. The Water Conservation Plan must contain the following items (or contain a statement why the item is not an appropriate part of the plan).

1. **System Management**
   - Within the most recent 24-month period, provide an estimate of Unaccounted for Water (UAW) for the system.
   - Provide an inventory of existing facilities, production characteristics, and water use (see attached table).

2. **Identification of Water Conservation Measures**
   - Provide a review of conservation measures that have been implemented and that are planned for implementation
     - Leak detection and elimination;
     - Availability of accurate maps of the system;
     - Meter maintenance, testing, replacement, calibration, etc.;
     - Recycling or reuse of treated wastewater within the system;
     - Upgrading old equipment with new water-efficient equipment
     - Enforcement of plumbing ordinances and/or other codes which promote water conservation;
     - Prevention of unauthorized or excessive water use.
   - Provide selection criteria for choosing conservation measures and improvements.
   - Provide overview of conditions, legal, or other barriers that might affect implementing planned water conservation measures and improvements.
   - Identification of other water conservation efforts or measures for further analysis.

3. **Drought Contingency Plan**
   - Develop a system for determining drought severity based on some approved indicator (e.g., system demands, groundwater levels, other, etc.)
   - Provide a potable water use priorities program (e.g., emergency use essential to life support, domestic use, lawn sprinkling, equipment, etc.)
   - Provide restrictions on lower priority uses and description of circumstances or events that put the priority use system into effect.

4. **Implementation of Water Conservation Measures**
   - Provide strategy and timetable for implementing planned/existing water conservation measures and improvements.

5. **Analysis of Benefits and Costs**
   - Provide estimates of total implementation costs and anticipated savings.
   - Comparison of implementation costs to avoided costs.
   - Discussion of effects of planned water conservation measures and improvements on revenues.

6. **Education Efforts**
   - Description of plan for public involvement
   - Description of community/employee involvement in the goals-development process

7. **Preparation of Demand Forecast**
   - Description of methods of collecting current and future water demand data
   - Forecast of anticipated water demand for future time periods (20 years)
   - Adjustments to demand based on known and measurable factors
   - Discussion of uncertainties and "what if" (sensitivity) analysis

8. **Evaluation of Strategy**
   - Provide schedule and review plan for updates and revisions to the water conservation plan
   - Provide certification of the conservation plan by the system's governing body

APPENDIX 2.

WATER RATE SCHEDULE

The City of Brooklet

Water Rates

Monthly Rates and Charges

Monthly Billing Rates for Charges and Water

$8.00
Base Charge of ~~$7.25~~ per REU*

Administration Charge of $1.25 per Account

Quantity /1000 gal inside the City

1 to 5,000 gallons ~~1.75~~ 2.30

5,001 to 10,000 gallons ~~2.00~~ 2.50

10,001 to 15,000 gallons ~~2.25~~ 2.75

15,001 to 20,000 gallons ~~2.75~~ 3.00

20,000 to 50,000 gallons ~~3.00~~ 4.00

Over 50,000 gallons ~~4.00~~ 5.00

REU = Residential Equivalent Unit

Residential Trash = ~~$12.00~~ $18.00

Commercial Trash = ~~$19.00~~ $25.00

APPENDIX 3.

CITY COUNCIL CERTIFICATION

Grand Totals by Rate Code and Revenue Code

Type	Code	Description	Count	Fam	Consumption	Amount
Charge:	015	WCIFUNDR	718	717	0	2,834.78
Charge:	016	WCIFUNDC	85	85	0	430.29
Charge:	017	WCIFUNDB	1	1	0	30.53
Charge:	019	WCIFUNDH	1	1	0	132.71
Charge:	031	WCIFUNDE	1	1	0	139.46
Rate:	**000**	**INVALID**	**806**	**805**	**0**	**3,567.77**
Revenue:	**CI**	**CAPITAL IM**	**806**	**805**	**0**	**3,567.77**
Charge:	DP	DEPOSIT	13	13	0	1,100.00-
Rate:	**DP**	**DEPOSIT**	**13**	**13**	**0**	**1,100.00-**
Revenue:	**DP**	**DEPOSIT**	**13**	**13**	**0**	**1,100.00-**
Charge:	020	GBG RES	695	694	0	12,834.00
Charge:	022	GBG COM	36	36	0	1,050.00
Charge:	023	GBG CH1	5	5	0	150.00
Charge:	025	GBG BRK	1	1	0	288.00
Rate:	**000**	**INVALID**	**737**	**736**	**0**	**14,322.00**
Revenue:	**GB**	**GARBAGE**	**737**	**736**	**0**	**14,322.00**
Charge:	011	SWR	12	12	61000	330.00
Rate:	**011**	**SEWER- RESIDENTIAL**	**12**	**12**	**61000**	**330.00**
Revenue:	**SW**	**SEWER**	**12**	**12**	**61000**	**330.00**
Charge:	006	ADMN FEE	807	806	0	1,008.75
Rate:	**000**	**INVALID**	**807**	**806**	**0**	**1,008.75**
Charge:	001	WTR RES	718	717	4756800	18,888.64
Rate:	**001**	**WATER RESIDENTAL**	**718**	**717**	**4756800**	**18,888.64**
Charge:	002	WTR COM	86	86	687000	2,875.90
Rate:	**002**	**WATER COMMERICAL**	**86**	**86**	**687000**	**2,875.90**
Charge:	004	WTR BRK	1	1	56000	203.50
Rate:	**004**	**WATER-BROOKHAVEN**	**1**	**1**	**56000**	**203.50**
Charge:	007	WA ELEM	1	1	157000	929.75
Rate:	**007**	**WATER.B.COUNT.BOR.ED**	**1**	**1**	**157000**	**929.75**
Charge:	008	HIGH SCH	1	1	112000	884.75
Rate:	**008**	**WATER.B.COUN.BOR.ED**	**1**	**1**	**112000**	**884.75**
Revenue:	**WA**	**WATER**	**1614**	**1612**	**5768800**	**24,791.29**
		GRAND TOTALS	**3182**	**3178**	**5829800**	**41,911.06**

Bracket

Questions

1 — is this 1 month?

1a — if so, how does this compare w/ other months?

2 — what % per unit?

3 — chart above shows only 2 schools. Are Elem. & M.S. together?

(Darrell) 4 — meter #s are to nearest whole gallon (cut 10 gals.)?

5.8 mg/month

counted/does

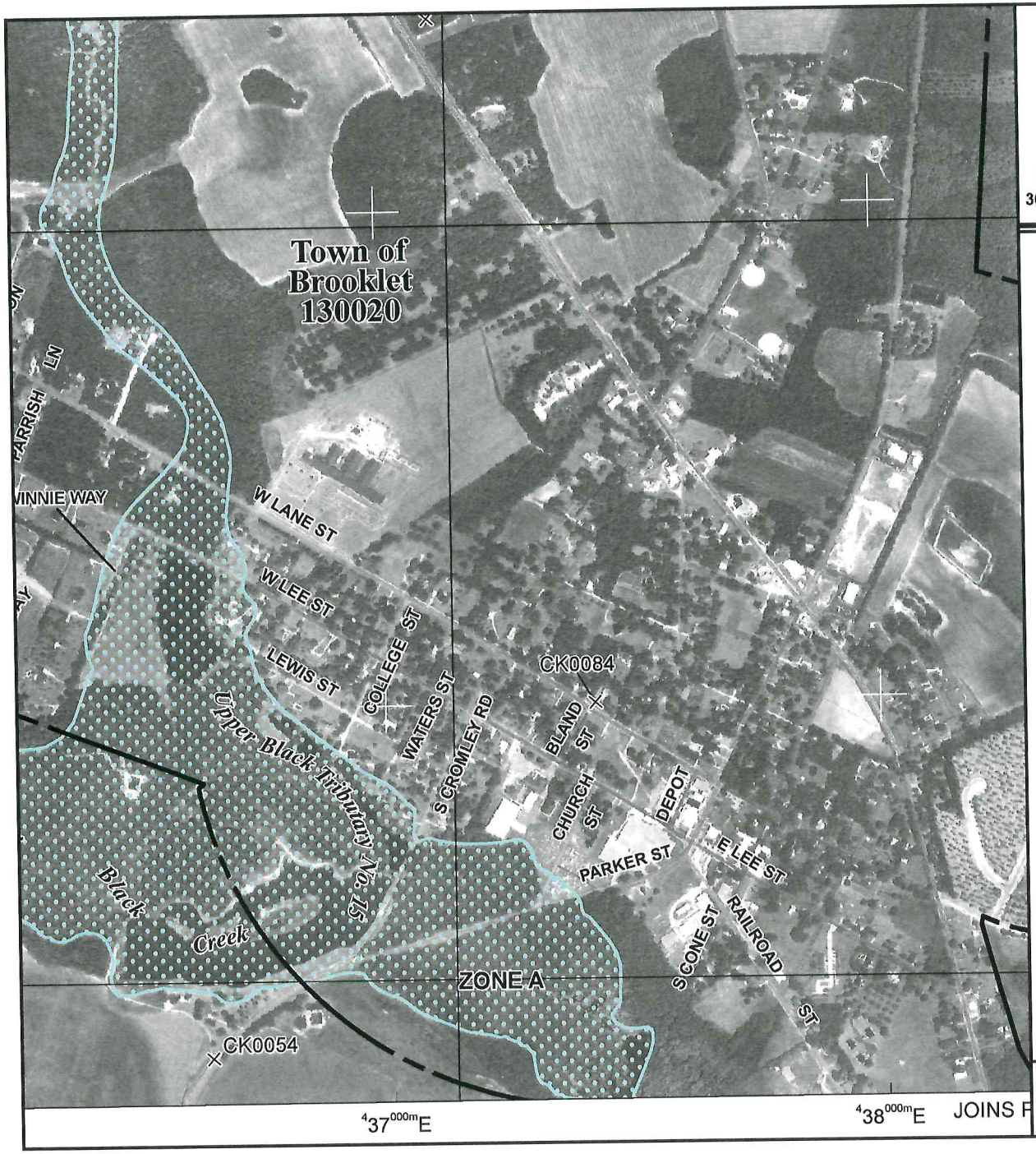
718 res.

86 comm.

1 appt.

3 Schools.

(ms & hs together)



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 M

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0245D

FIRM

FLOOD INSURANCE RATE MAP

BULLOCH COUNTY, GEORGIA
AND INCORPORATED AREAS

PANEL 245 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

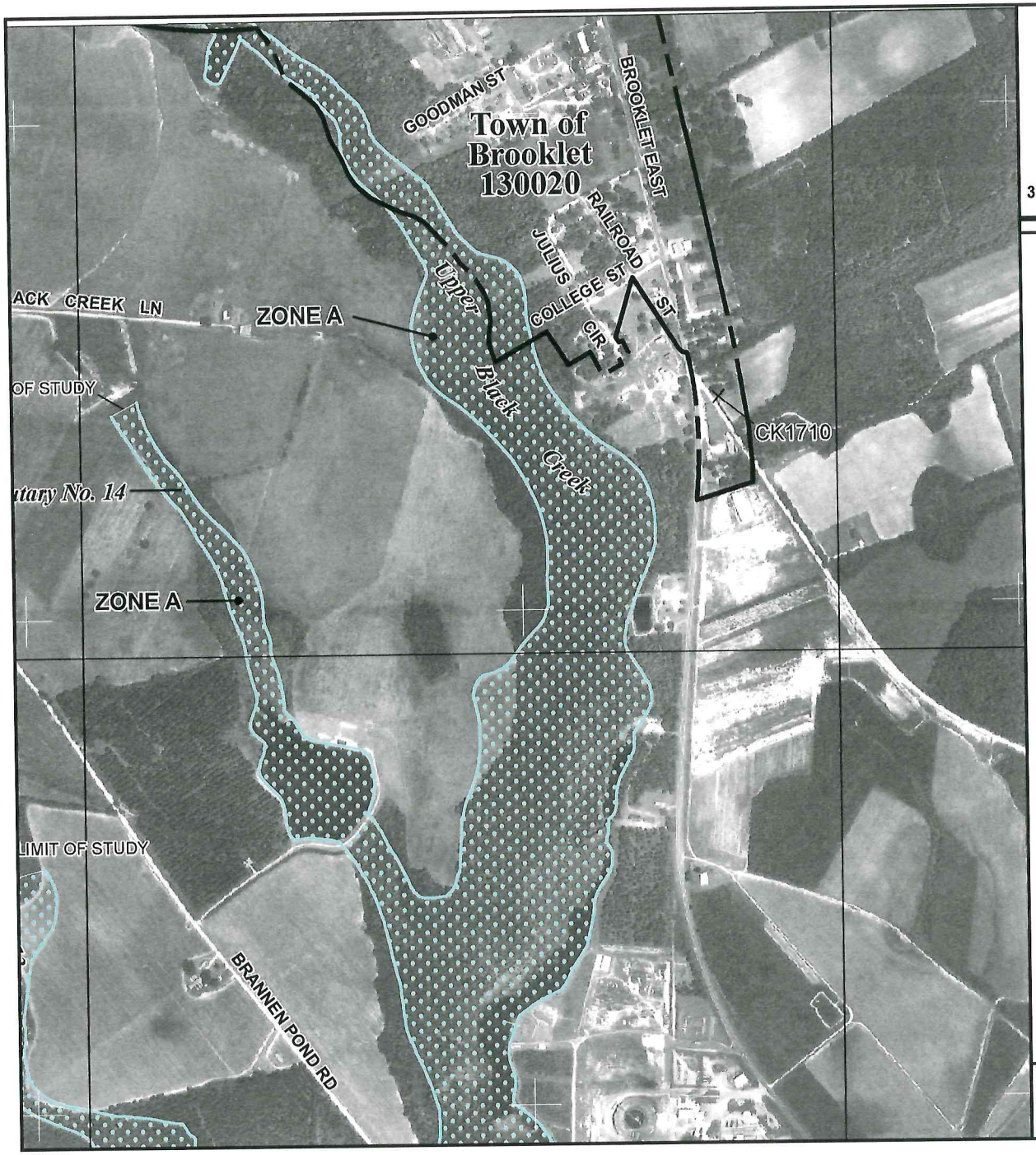
COMMUNITY	NUMBER	PANEL	SUFFIX
BROOKLET, TOWN OF	130020	0245	D
BULLOCH COUNTY	130019	0245	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
13031C0245D

EFFECTIVE DATE
AUGUST 5, 2010

Federal Emergency Management Agency



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 M

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0335D

FIRM

FLOOD INSURANCE RATE MAP

BULLOCH COUNTY, GEORGIA
AND INCORPORATED AREAS

PANEL 335 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROOKLET, TOWN OF	130020	0335	D
BULLOCH COUNTY	130019	0335	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
13031C0335D

EFFECTIVE DATE
AUGUST 5, 2010

Federal Emergency Management Agency

SAFETY PROPOSAL FOR INTERSECTION OF LEE AND PARKER AVE

The Brooklet Safety Committee has initiated this proposal due to the difficulty traffic has entering the intersection safely. Parker Ave traffic is too fast, and visibility to see the traffic from West Lee St or East Lee St is blocked by parked vehicles on Parker Ave. The addition of one STOP sign to Parker Ave at West Lee St and one STOP sign to Parker Ave at Railroad St. would create a STOP at all five streets entering the intersection. This will not only offer safety for all vehicles and pedestrians entering this intersection, but it will also slow down Parker Ave traffic through the Brooklet downtown area.

THE COST OF THIS PROJECT:

2 ea. Stop Signs, 30X30_we have them on hand

Elon...

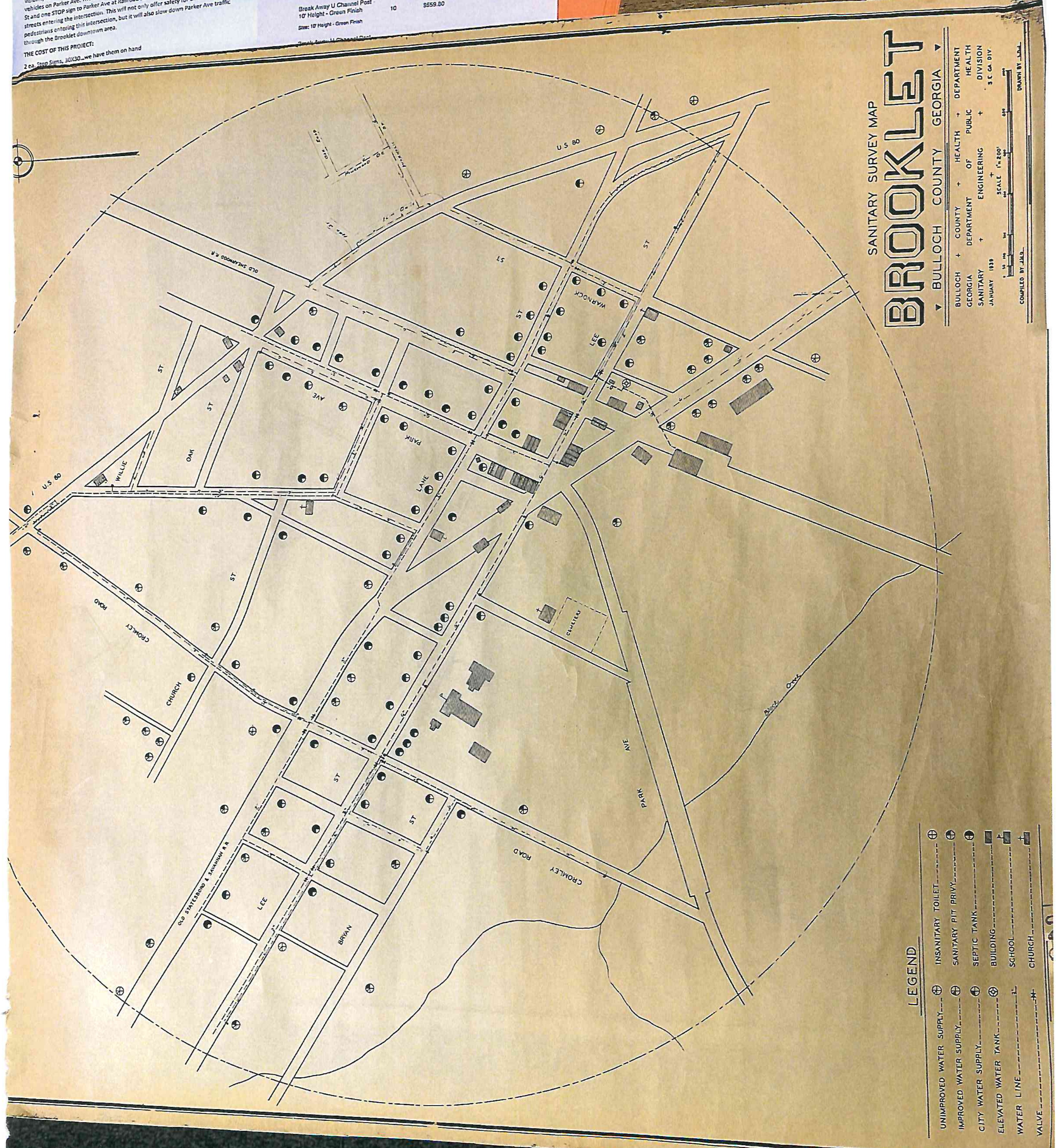
HI LORI,

Just to let you know — we've received your order #28624, and it is now being processed:

[Order #28624] (January 26, 2023)

Product	Quantity	Price
Break Away U Channel Post - 10' Height - Green Finish Size: 10' Height - Green Finish	10	$559.80

Break Away U Channel Post




STATESBORO
Location of new
municipal well
Source #101
Brooklet
Source #102
SCALE 1:24 000
BROOKLET, GA
2020

GEORGIA WELLHEAD PROTECTION PLAN (partial)

For

CITY OF BROOKLET
BULLOCH COUNTY

A COMMUNITY
PUBLIC WATER SYSTEM
WSID #0310000

Field Survey By:	Margaret W. Chambers	Date: 08/18/1999
Revised By:	Sandra Jo Robertson	Date: 07/03/2008
Revised By:	Michael Gillis	Date: 04/05/2018
Approved By:	J Richard Rucker	Date: 4-12-18
Distribution:	WPB; Local Government	

SYSTEM INFORMATION

Water System:	City of Brooklet
County:	Bulloch
System ID No:	0310000
Number of Sources:	2 wells
Population:	1456
District:	Coastal District (Brunswick)
Province:	Coastal Plain
Aquifer Type:	unconfined Coastal Plain
Significant Recharge Area: [1]	no
Supplier:	City of Brooklet
Contact:	Lindsay R. Martin
Title:	Operator
Address:	City of Brooklet 236 North Main Street Statesboro, Ga. 30458
Phone:	(912) 489-6668

Alternate Water Source: The City of Brooklet water system consists of two wells. In the event of an emergency where one well cannot be used, the City would rely on the remaining well or truck in water to provide for the community's needs, until the equipment is repaired or an alternate source can be found.

[1]Hydrologic Atlas 18, Most Significant Ground-Water Recharge Areas of Georgia Department of Natural Resources, Atlanta, 1989.

Part 1: DELINEATING THE WELLHEAD PROTECTION AREA

see attached map

Source #101

Well #1

Location description:	Located next to the City Police department on Lee Street, near the intersection of Lee Street & Cone Street. The well is believed to be 515 Feet deep.
Longitude:	81°·39' 42.540"W
Latitude:	32° 22' 42.951"N
Aquifer Type:	unconfined Coastal Plain*
Delineation Method:	volumetric flow equation
Pumping rate:	400 gpm
Cement Pad:	present
Well House:	present
Fence:	present
Locked Gate:	present
Control Zone:	15 foot radius
Inner-Management Zone:	250 foot radius
Outer-Management Zone:	589 foot radius

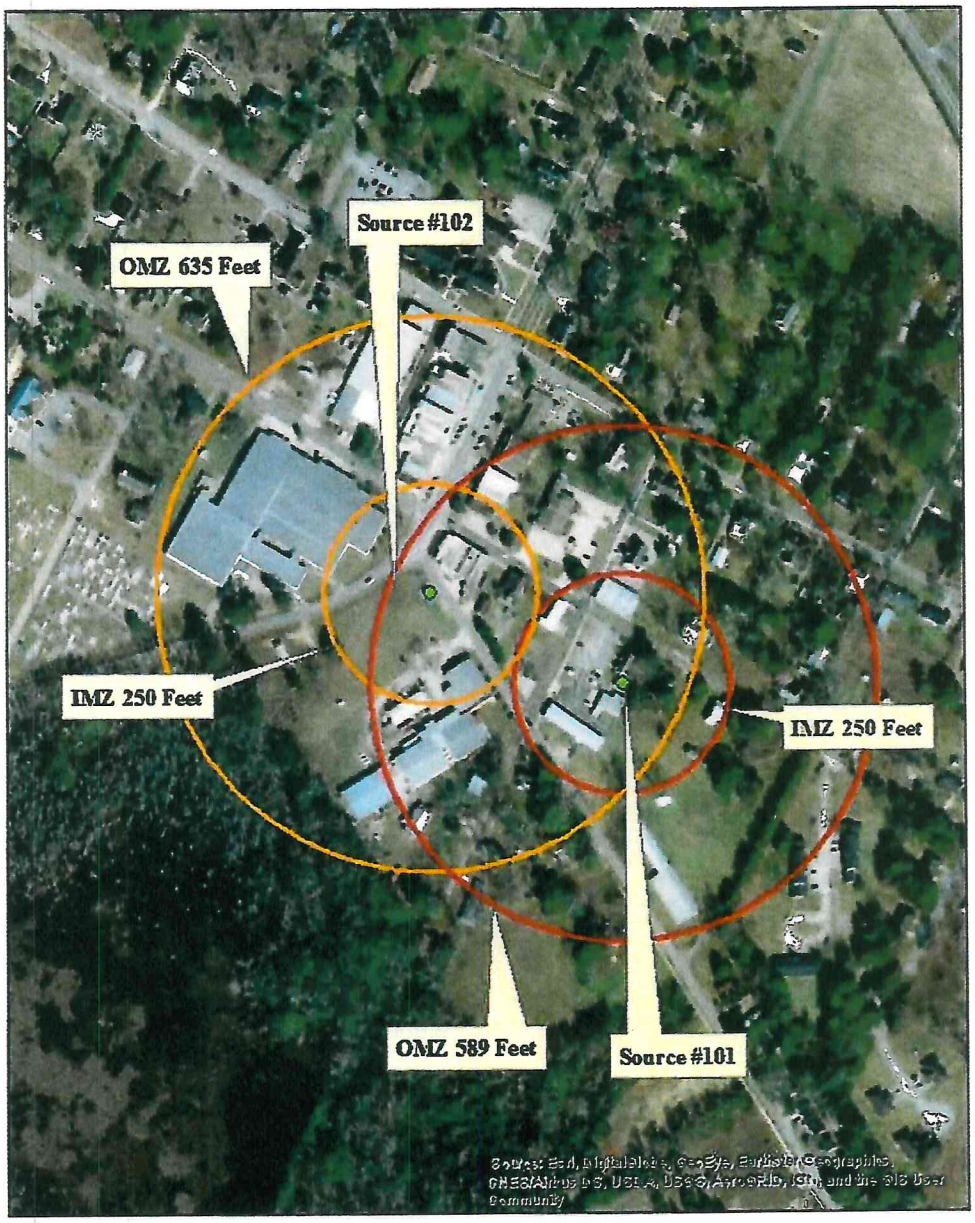
*This well is delineated as unconfined Coastal Plain (open Hole) due to the lack of specific well construction data.

Source #102

Well #2

Location description:	Located at the intersection of Parker Avenue & Railroad Street. The well is believed to be 500 Feet deep.
Longitude:	81° 39' 47.709"W
Latitude:	32° 22' 44.974"N
Aquifer Type:	unconfined Coastal Plain*
Delineation Method:	volumetric flow equation
Pumping rate:	450 gpm
Cement Pad:	present
Well House:	present
Fence:	present
Locked Gate:	present
Control Zone:	15 foot radius
Inner-Management Zone:	250 foot radius
Outer-Management Zone:	635 foot radius

*This well is delineated as unconfined Coastal Plain (open Hole) due to the lack of specific well construction data.



City of Brooklet
Bulloch County
WSID #0310000

0 275 550 1,100 Feet