Watershed Improvement Plan Phase II Revision

For

Cabin Creek

(Headwaters, Griffin to Towaliga River)

Spalding County and Butts County, Georgia

DRAFT

September 30, 2011

Prepared by
Three Rivers Regional Commission

Submitted to
Georgia Department of Natural Resources
Environmental Protection Division

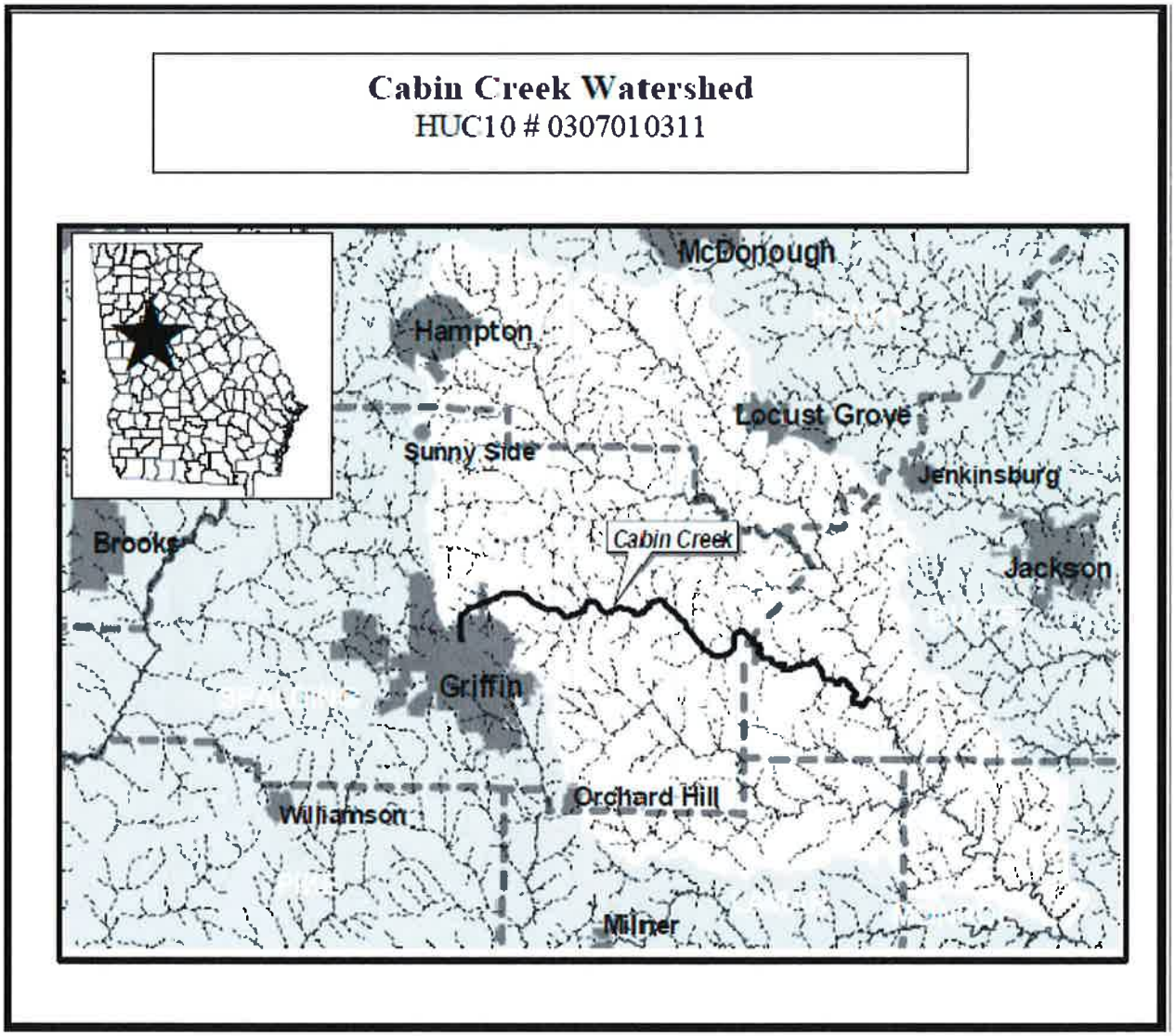
The preparation of this document was financed in part by the Georgia Environmental Protection Division of the Department of Natural Resources, through a grant from the U.S. Environmental Protection Agency under the Provisions of Section 604(b) of the Federal Water Pollution Control Act, as amended.

Table of Contents

Watershed Location:

The area where the Cabin Creek watershed lies is approximately 40 miles south of Atlanta in central Georgia. Cabin Creek begins in the City of Griffin then flows through Spalding County and into Butts County before it empties into the Towaliga River. The Towaliga eventually empties into the Ocmulgee River.

Although the creek begins in an urban environment, the majority of the Cabin Creek watershed is rural piedmont. Rolling hills with farms, low density residential, and forest are predominate.



Watershed and Segment Description:

Cabin Creek begins as an urban stream. The watershed within the City of Griffin is, for the most part, built out and contains a high percentage of impervious surface. The watershed lies within residential, commercial and industrial along with some wooded areas. According to the Cabin Creek Watershed Assessment, the watershed inside the City of Griffin is approximately 1,195 acres. Once the creek leaves the City of Griffin, it then works its way east through suburban and low density residential areas. The watershed thereafter remains low density residential but also becomes quite rural through Spalding County until its confluence with the Towaliga River in Butts County.

The chart below shows land use categories within the watershed as stated in the Environmental Protection Agency's TMDL Report dated from 2007.

Cabin Creek Watershed Land Use Categories – Acres (Percent)												
Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial, Industrial, Transportation	Bare Rock, Sand, Clay	Quarries, Strip Mines, Gravel Pits	Forest	Row Crops	Pasture, Hay	Other Grasses (Urban, recreational; e.g. parks, lawns)	Woody Wetlands	Emergent Herbaceous Wetlands	Total
239 (1.1)	1888 (8.7)	1053 (4.9)	298 (1.4)	46 (0.2)	82 (0.4)	11627 (53.7)	13 (0.1)	4652 (21.5)	1090 (5.0)	666 (3.1)	0	21655

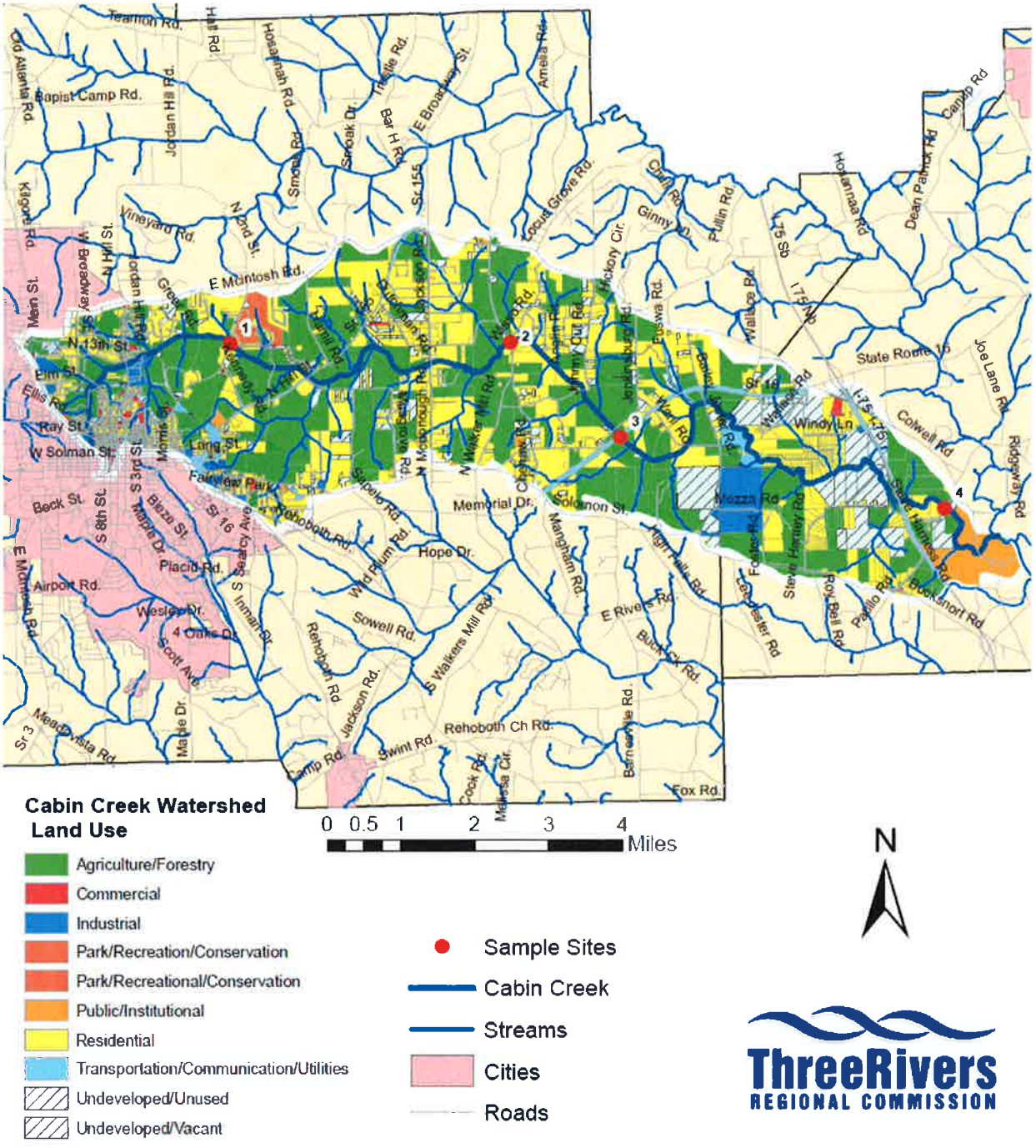
Cabin Creek is listed on Georgia 303(d) list of impaired water bodies due to high fecal coliform readings obtained during sampling events in 1999. In 2002, Georgia EPD revised Total Maximum Daily Loads (TMDLs) for impaired stream segments addressed by the 2002 Ocmulgee River Basin Fecal Coliform TMDLs and in Fecal Coliform TMDLs developed by USEPA prior to 2002 which includes the Cabin Creek segment.

A Total Maximum Daily Load (TMDL) was developed by USEPA in 2002 to address pollutant loads in the watershed. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

Sources of fecal coliform contamination come from either point sources or non-point sources.

Point Sources include wastewater treatment facilities, sewer line failures, illicit discharges, confined animal feeding lots (CFOs). Non-point sources include landfills, agricultural runoff, urban runoff, leaking septic systems, and wildlife. All of these sources could have an impact within the Cabin Creek watershed.

CABIN CREEK WATERSHED LAND USE



Watershed Monitoring and Data Results:

Methodology and Data Summary

Water samples were collected and tested using the LaMotte ColiQuant EZ kit. This testing kit utilizes the Coliscan Easygel EZ Method which has been approved by Georgia Environmental Protection Division. The second year of water quality monitoring was conducted using a similar Coliscan Easygel product made by Micrology Laboratories, LLC. Detailed information regarding the use of this method is attached to this document.

Fecal coliform colonies are reported as Colony Forming Units (CFU) per 100 milliliters of water. The number of colonies are counted, multiplied by 100 then divided by the sample amount.

Fecal Coliform Colonies mL (CFU/mL) = # Colonies/Amount of Sample used

Cabin Creek Watershed Extended Revision Monitoring - Summer 2009 – CFU/100 mL		
Site	**Date**	
	July 20, 2009	**September 14, 2009**
1 – Jordan Hill Road, Spalding County	1233	900
2 – N. Walker Mill Road, Spalding County	833	933
3 – I-16, Spalding County	333	466
4 – Colwell Road, Butts County	333	500

Cabin Creek Watershed Monitoring Sites September 22, 2010		**Total CFU/mL**
Site 1	Jordan Hill Road – Spalding County	**633 mL**
Site 2	N. Walker Mill Road – Spalding County	**466 mL**
Site 3	GA Hwy 16 – Spalding County	**633 mL**
Site 4	Colwell Road – Butts County	**700 mL**

There was only one sampling event during year one of the Watershed Improvement Plan. During the second year of the project, water quality sampling took place June, July, and August of 2011. The results from that testing period can be seen on the next page.

Cabin Creek Watershed Monitoring - Summer 2011 – CFU/100			
Site	**Month**		
	June	**July**	**Aug**
1 – Jordan Hill Road, Spalding County	117	50	67
2 – N. Walker Mill Road, Spalding County	183	50	67
3 – I-16, Spalding County	117	100	50
4 – Colwell Road, Butts County	83	83	67

Detailed Monitoring Results – September 2010

Site 1 – Jordan Hill Road (N. 2nd St.) – September 22, 2010				
Time	**Air Temp (f)**	**Water Temp (f)**	**Weather Conditions**	**Rainfall (last 72 hrs)**
11:50 AM	85.4	74.5	Sunny	0.85"
Sample Dish (1 mL sample used)				
1	**2**	**3**	**Average CFU**	
700 / 100 mL	700 / 100 mL	500 / 100 mL	633 mL	

Site 2 – N. Walker Mill Road – September 22, 2010				
Time	**Air Temp (f)**	**Water Temp (f)**	**Weather Conditions**	**Rainfall (last 72 hrs)**
12:05 PM	86.7	72	Sunny	0.85"
Sample Dish (1 mL sample used)				
1	**2**	**3**	**Average CFU**	
800 / 100 mL	0 / 100 mL	600 / 100 mL	466 mL	

Site 3 – GA Hwy 16 – September 22, 2010				
Time	**Air Temp (f)**	**Water Temp (f)**	**Weather Conditions**	**Rainfall (last 72 hrs)**
12:30 PM	86.3	72	Sunny	0.85"
Sample Dish (1 mL sample used)				
1	**2**	**3**	**Average CFU**	
600 / 100 mL	700 / 100 mL	600 / 100 mL	633 mL	

Site 4 – Colwell Road – September 23, 2010				
Time	**Air Temp (f)**	**Water Temp (f)**	**Weather Conditions**	**Rainfall (last 72 hrs)**
12:46 PM	87.3	72.5	Sunny	0.85"
Sample Dish (1 mL sample used)				
1	**2**	**3**	**Average CFU**	
600 / 100 mL	700 / 100 mL	800 / 100 mL	700 mL	

Detailed Monitoring Results – Summer 2011

Water Monitoring Data - June 30th, 2011 (2 mL sample used)						
Site	**Time**	**Air Temp (f)**	**Water Temp (f)**	**Rainfall**	**3 Dish CFU Counts**	**CFU/100mL**
Site 1	10:13 AM	85°	72.5°	>72 hours	4/2/1	117
Site 2	10:34 AM	87°	72.5°		4/3/4	183
Site 3	10:53 AM	87°	74°		3/2/2	117
Site 4	11:14 AM	88°	74.5°		3/0/2	83

Water Monitoring Data - July 26th, 2011 (2 mL sample used)						
Site	**Time**	**Air Temp (f)**	**Water Temp (f)**	**Rainfall**	**3 Dish CFU Counts**	**CFU/100mL**
Site 1	11:53 AM	84°	80°	>72 hours	1/0/2	50
Site 2	12:12 PM	87°	76°		1/0/1	50
Site 3	12:25 PM	87°	78°		3/2/1	100
Site 4	12:39 PM	87°	77°		1/4/0	83

Water Monitoring Data – August 22nd, 2011 (2 mL sample used)						
Site	**Time**	**Air Temp (f)**	**Water Temp (f)**	**Rainfall**	**3 Dish CFU Counts**	**CFU/100mL**
Site 1	11:13 AM	87°	77°	>72 hours	2/1/1	67
Site 2	11:45 AM	87°	77°		2/2/0	67
Site 3	12:02 PM	87°	78°		1/0/1	50
Site 4	12:23 PM	88°	79°		0/2/2	67

The City of Griffin Stormwater Department conducts water quality monitoring as part of their NPDES permit requirements. Below is a list of the data results dated from 2009 to 2011.

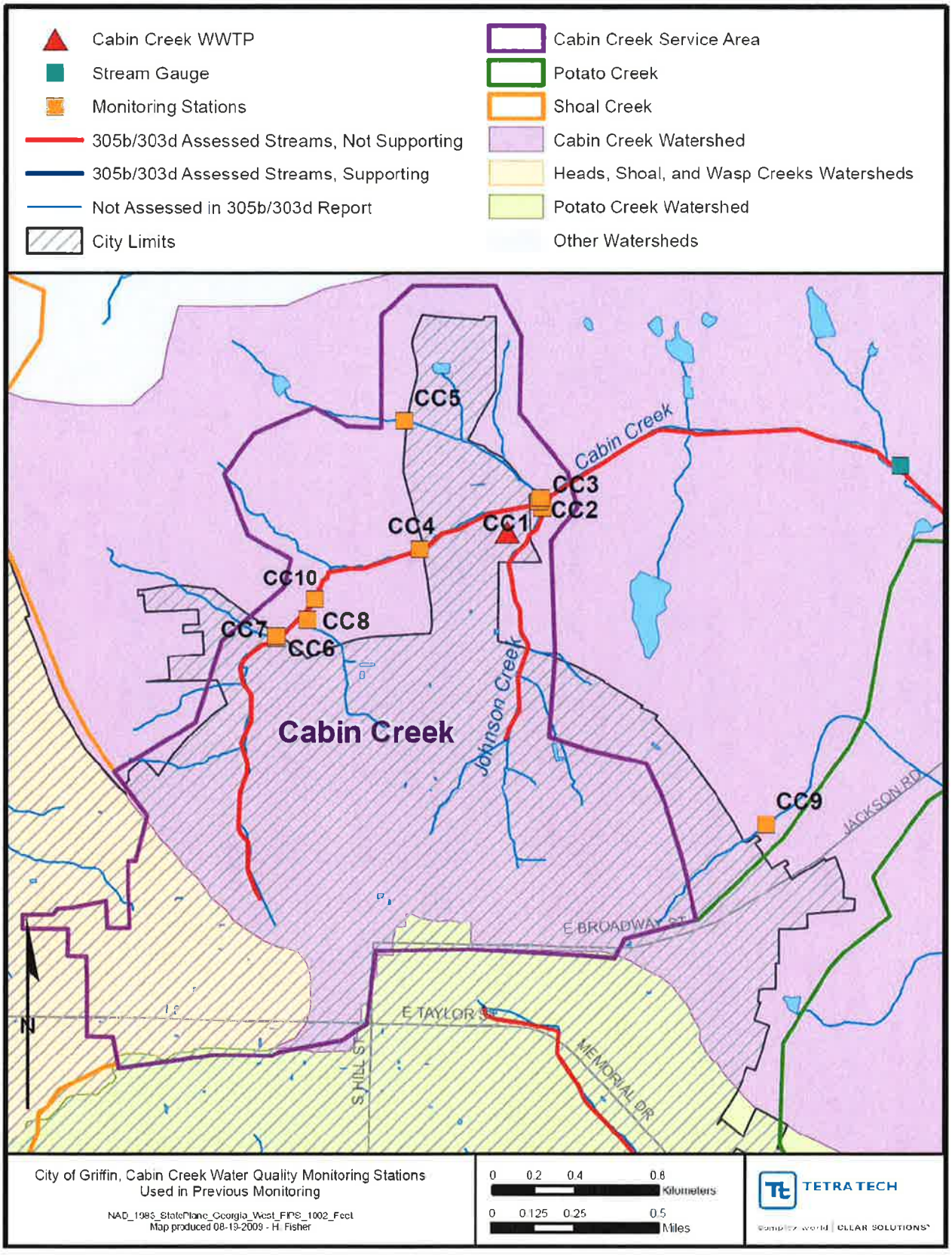
City of Griffin Stormwater Department Cabin Creek Water Monitoring Data			
Date	**Location**	**Fecal (No./100 mL)**	**Sample Type**
2/23/2009	CC1	180	Dry
2/23/2009	CC10	420	Dry
2/23/2009	CC9	15	Dry
7/6/2009	CC1	> 6000	Wet
7/6/2009	CC10	3,200	Wet
7/6/2009	CC9	900	Wet
8/11/2009	CC1	76	Dry
8/11/2009	CC10	335	Dry
8/11/2009	CC9	2,280	Dry
12/9/2009	CC1	700	Wet
12/9/2009	CC10	500	Wet
12/9/2009	CC9	510	Wet
5/17/2010	CC0	11,000	Wet
5/17/2010	CC10	10,000	Wet
5/17/2010	CC9	1,100	Wet
6/22/2010	CC0	460	Dry
6/22/2010	CC10	445	Dry
6/22/2010	CC9	210	Dry
8/26/2010	CC0	17,000	Wet
8/26/2010	CC10	20,000	Wet
8/26/2010	CC9	4,300	Wet
8/26/2010	CC2	29,000	Wet
8/26/2010	CC3	2,500	Wet
11/11/2010	CC0	260	Dry
11/11/2010	CC2	180	Dry
11/11/2010	CC3	160	Dry
11/11/2010	CC10	140	Dry
11/11/2010	CC9	12,000	Dry
7/20/2010	CC0	245	Geometric mean sampling
7/20/2010	CC2	430	Geometric mean sampling
7/20/2010	CC3	3,800	Geometric mean sampling
7/20/2010	CC10	480	Geometric mean sampling
7/20/2010	CC9	400	Geometric mean sampling
7/27/2010	CC0	2,400	Geometric mean sampling
7/27/2010	CC2	43,000	Geometric mean sampling

7/27/2010	CC3	540	Geometric mean sampling
7/27/2010	CC10	2,200	Geometric mean sampling
7/27/2010	CC9	420	Geometric mean sampling
8/3/2010	CC0	360	Geometric mean sampling
8/3/2010	CC2	2,300	Geometric mean sampling
8/3/2010	CC3	2,050	Geometric mean sampling
8/3/2010	CC10	1,300	Geometric mean sampling
8/3/2010	CC9	310	Geometric mean sampling
8/10/2010	CC0	350	Geometric mean sampling
8/10/2010	CC2	580	Geometric mean sampling
8/10/2010	CC3	600	Geometric mean sampling
8/10/2010	CC10	350	Geometric mean sampling
8/10/2010	CC9	330	Geometric mean sampling
9/14/2010	CC0	460	Geometric mean sampling
9/14/2010	CC2	1,950	Geometric mean sampling
9/14/2010	CC3	420	Geometric mean sampling
9/14/2010	CC10	1,300	Geometric mean sampling
9/14/2010	CC9	120	Geometric mean sampling
9/21/2010	CC0	140	Geometric mean sampling
9/21/2010	CC2	410	Geometric mean sampling
9/21/2010	CC3	950	Geometric mean sampling
9/21/2010	CC10	125	Geometric mean sampling
9/21/2010	CC9	13,000	Geometric mean sampling
9/28/2010	CC0	95	Geometric mean sampling
9/28/2010	CC2	1,800	Geometric mean sampling
9/28/2010	CC3	900	Geometric mean sampling
9/28/2010	CC10	1,400	Geometric mean sampling
9/28/2010	CC9	250	Geometric mean sampling
10/5/2010	CC0	150	Geometric mean sampling
10/5/2010	CC2	420	Geometric mean sampling
10/5/2010	CC3	550	Geometric mean sampling
10/5/2010	CC10	290	Geometric mean sampling
10/5/2010	CC9	140	Geometric mean sampling
2/22/2011	CC0	1,200	Dry
2/22/2011	CC2	350	Dry
2/22/2011	CC3	700	Dry
2/22/2011	CC10	130	Dry
2/22/2011	CC9	120	Dry
5/3/2011	CC0	340	Geometric mean sampling
5/3/2011	CC2	1,300	Geometric mean sampling
5/3/2011	CC3	310	Geometric mean sampling
5/3/2011	CC10	320	Geometric mean sampling
5/3/2011	CC9	2,900	Geometric mean sampling

5/10/2011	CC0	370	Geometric mean sampling
5/10/2011	CC2	250	Geometric mean sampling
5/10/2011	CC3	470	Geometric mean sampling
5/10/2011	CC10	440	Geometric mean sampling
5/10/2011	CC9	4,000	Geometric mean sampling
5/17/2011	CC0	520	Geometric mean sampling
5/17/2011	CC2	185	Geometric mean sampling
5/17/2011	CC3	250	Geometric mean sampling
5/17/2011	CC10	340	Geometric mean sampling
5/17/2011	CC9	150	Geometric mean sampling
5/24/2011	CC0	580	Geometric mean sampling
5/24/2011	CC2	380	Geometric mean sampling
5/24/2011	CC3	510	Geometric mean sampling
5/24/2011	CC10	400	Geometric mean sampling
5/24/2011	CC9	290	Geometric mean sampling
6/23/2011	CC0	2,000	Wet
6/23/2011	CC2	2,400	Wet
6/23/2011	CC3	1,050	Wet
6/23/2011	CC10	3,000	Wet
6/23/2011	CC9	540	Wet
9/13/2011	CC0	210	Geometric mean sampling
9/13/2011	CC2	1,100	Geometric mean sampling
9/13/2011	CC3	950	Geometric mean sampling
9/13/2011	CC10	210	Geometric mean sampling
9/13/2011	CC9	440	Geometric mean sampling
9/20/2011	CC0	200	Geometric mean sampling
9/20/2011	CC2	570	Geometric mean sampling
9/20/2011	CC3	520	Geometric mean sampling
9/20/2011	CC10	160	Geometric mean sampling
9/20/2011	CC9	2,900	Geometric mean sampling
9/21/2011	CC0	35,000	Wet
9/21/2011	CC2	48,000	Wet
9/21/2011	CC3	5,800	Wet
9/21/2011	CC10	17,000	Wet
9/21/2011	CC9	3,900	Wet

A map on the following page shows the location of the Cabin Creek water monitoring stations. No water quality monitoring was conducted within the city limits or by the City of Griffin specifically for the Cabin Creek Watershed Improvement Plan.

The maps on the following pages show where the monthly sampling sites are located. The maps also show where visual field survey observation sites are located. These visual field survey sites were observed during Phase II of the Watershed Improvement Plan.


Cabin Creek WWTP
Stream Gauge
Monitoring Stations
305b/303d Assessed Streams, Not Supporting
305b/303d Assessed Streams, Supporting
Not Assessed in 305b/303d Report
City Limits
Cabin Creek Service Area
Potato Creek
Shoal Creek
Cabin Creek Watershed
Heads, Shoal, and Wasp Creeks Watersheds
Potato Creek Watershed
Other Watersheds
CC1
CC2
CC3
CC4
CC5
CC6
CC7
CC8
CC9
CC10
Cabin Creek
Johnson Creek
E BROADWAY ST
E TAYLOR ST
MEMORIAL DR
JACKSON RD
N
City of Griffin, Cabin Creek Water Quality Monitoring Stations
Used in Previous Monitoring
NAD_1983_StatePlane_Georgia_West_FIPS_1002_Feet
Map produced 08-19-2009 - H. Fisher
0 0.2 0.4 0.8 Kilometers
0 0.125 0.25 0.5 Miles
TETRA TECH

Visual Field Surveys:

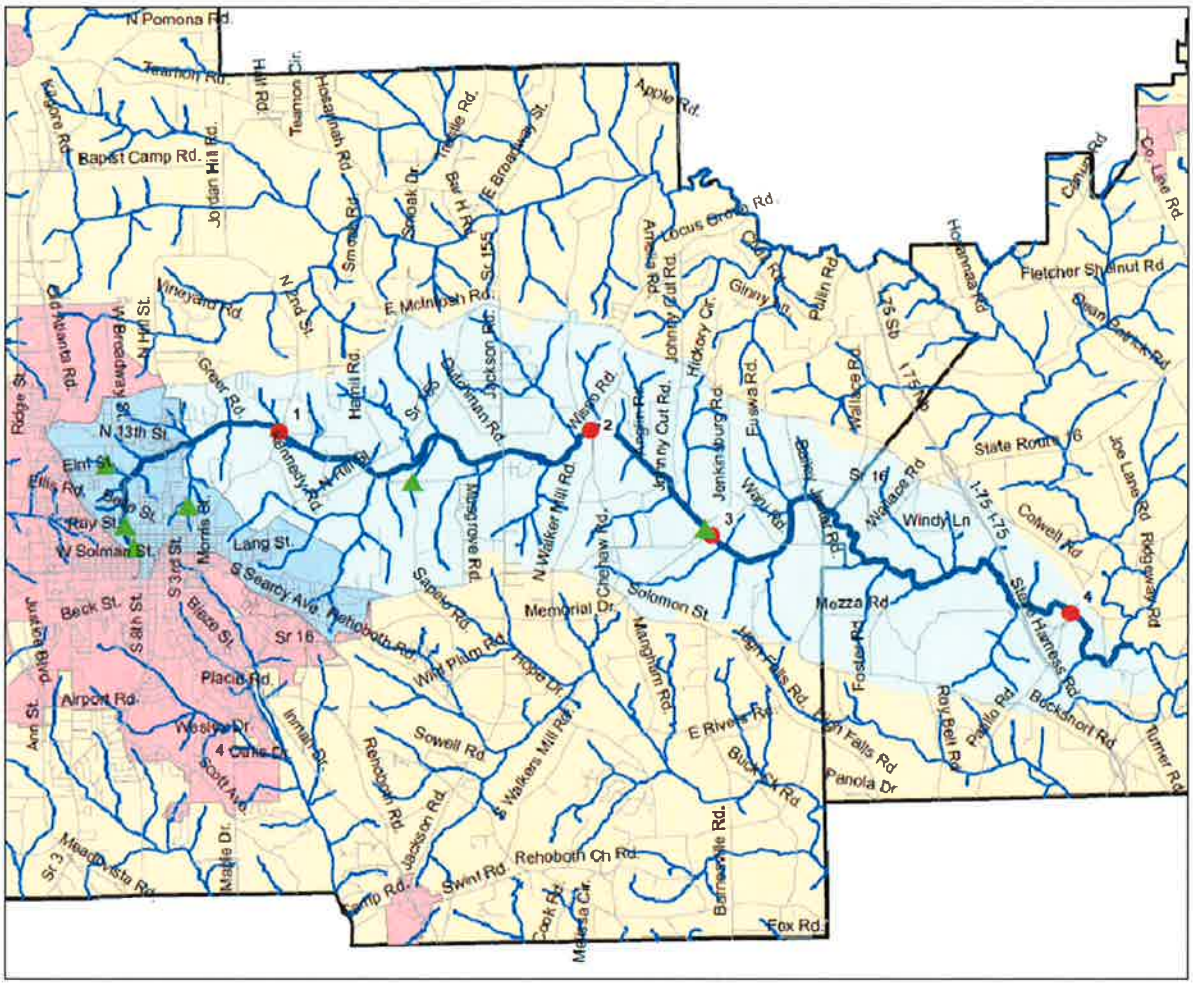
Visual surveys of the Cabin Creek watershed were initially conducted as part of the Extended Revision project in 2009. During the first phase of the Watershed Improvement Plan and visual field survey was conducted prior to sampling in the summer of 2010. As part of the second phase of the WIP, visual field surveys were conducted in areas not previously covered and during regular sampling events.

On September 15th, 2011, more detailed visual field survey coverage was given to the urban areas of the watershed within the City of Griffin. It was quite apparent that urban runoff could easily be a factor to fecal coliform contamination in the creek. The percentage of impervious surface in the city is quite high especially in the areas adjacent to the creek. The amount of water in the stream within the City of Griffin will vary drastically from dry periods to rain events. Without rain the stream is quite docile. There were no rain events during or around the time of the observations made this summer.

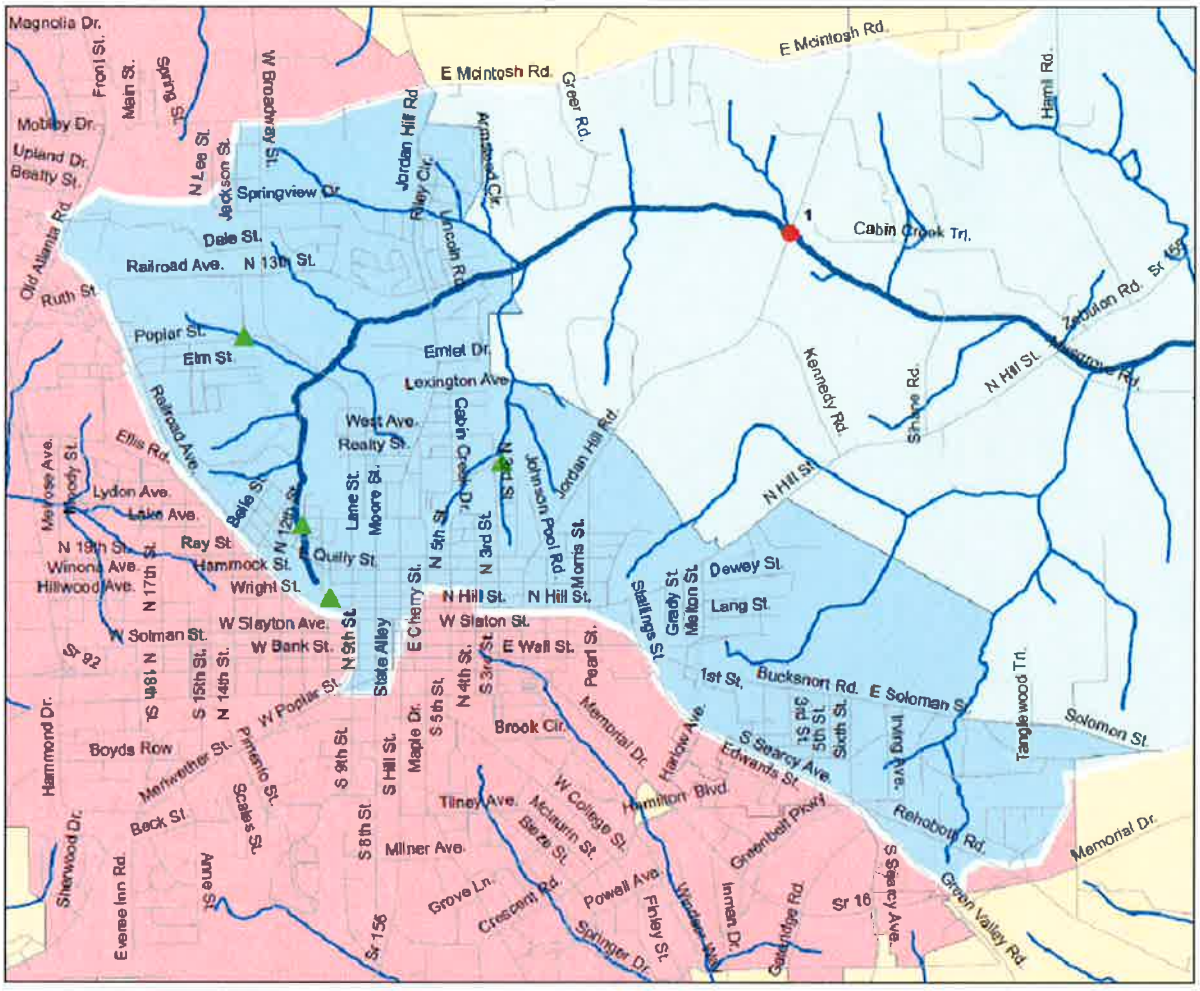
The stream gains strength and velocity as more tributaries empty into the creek. During the visual field surveys of 2011, an effort was made to observe the urban tributaries. Some of these were almost as mature as Cabin Creek itself and others were completely dry. The stream will also gain strength after the Cabin Creek Wastewater Treatment Plant. The WWTP (NPDES Permit #GA0020214) has the authority to discharge 1.5 MGD into the stream. The WWTP does not currently reach this amount of discharge. The average discharge at the plant is 0.83 MGD.

Trash was a common occurrence in the stream bed but mainly in the urban portion of the watershed. Moderate amounts of trash were also found at the Jordan Hill Road sampling Site 2. As the stream continues through the rural areas of Spalding and Butts County, the sight of trash became less.

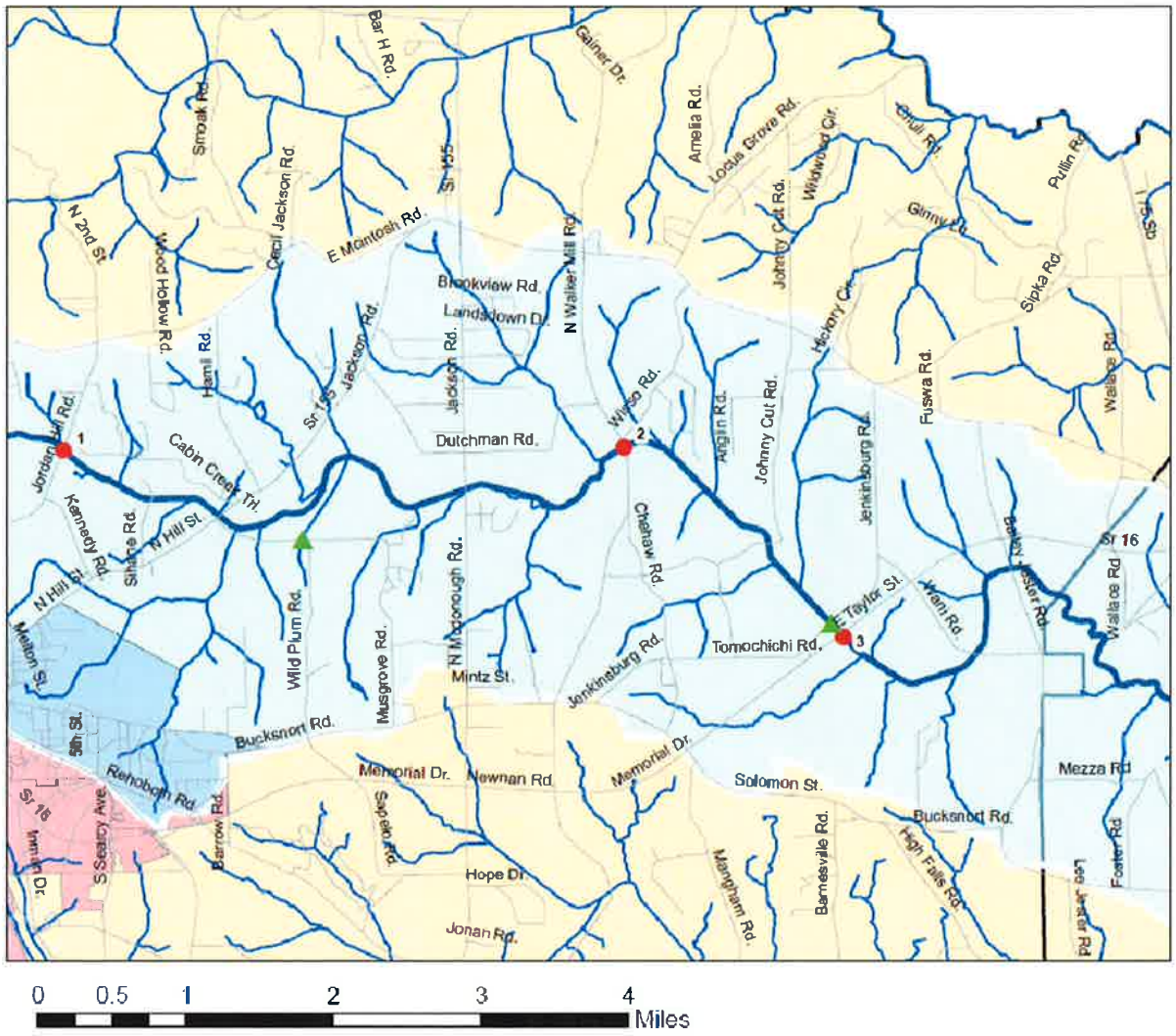
CABIN CREEK WATERSHED



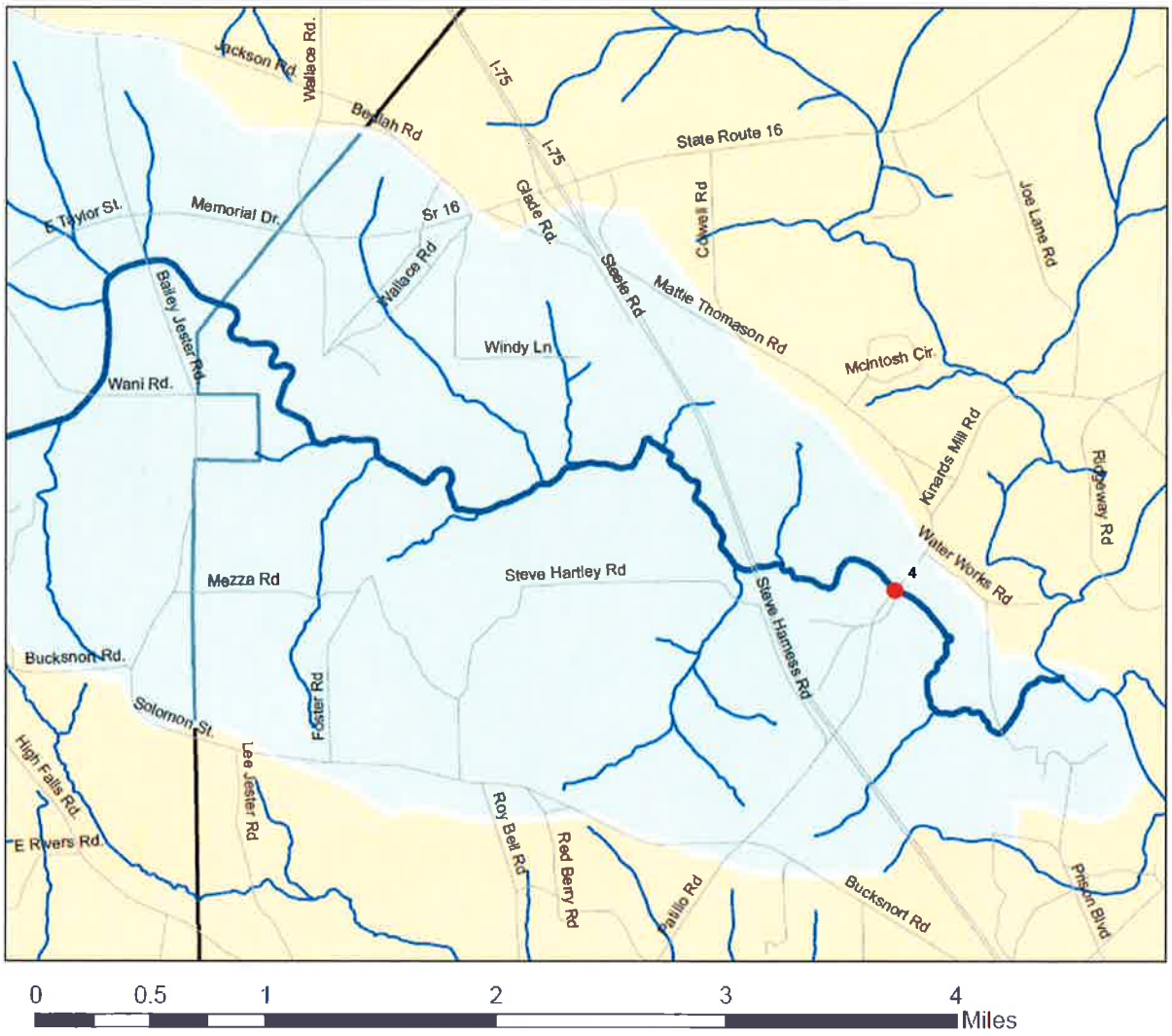
CABIN CREEK WATERSHED URBAN AREA



CABIN CREEK WATERSHED
SPALDING RURAL



CABIN CREEK WATERSHED
BUTTS COUNTY RURAL



Visual Field Survey Photo Summary

Photo below is taken from W. Broadway Street. Cabin Creek emerges from a culvert. September 22, 2011.

Photo taken at W. Broadway St. September 22, 2011

Photo below shows the slope of W. Broadway Street as it parallels Cabin Creek in the City of Griffin. September 22, 2011.

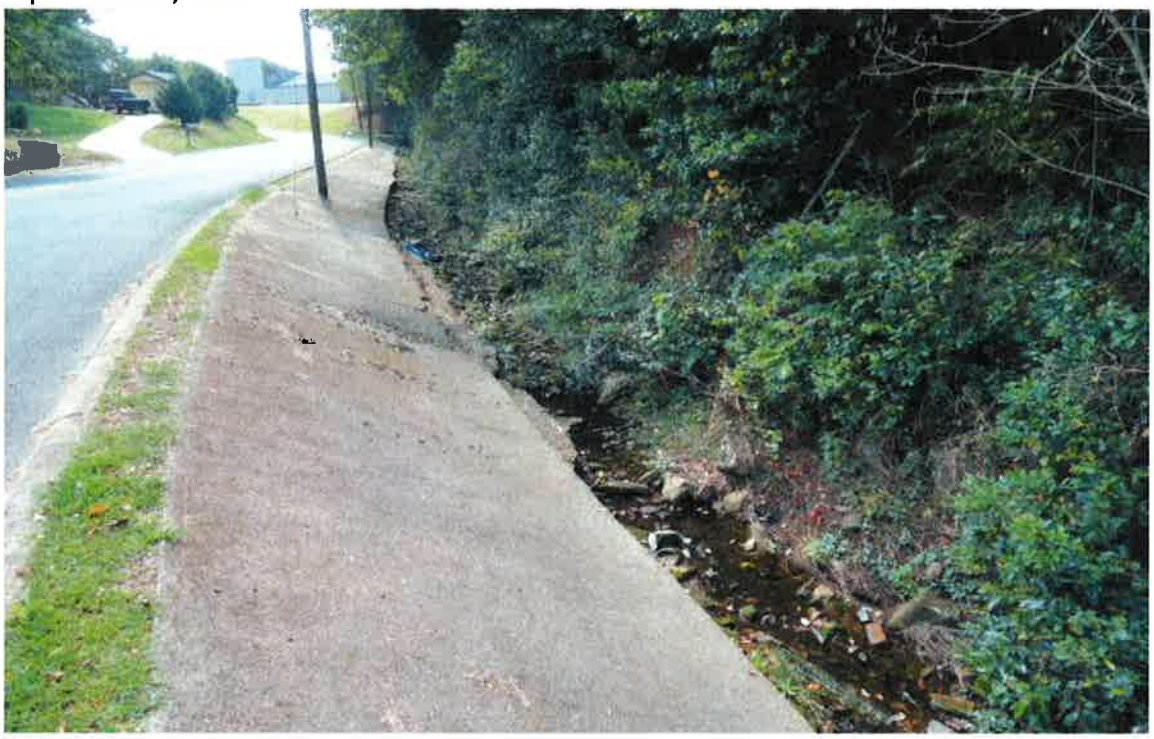


Photo below shows a curb cut for stormwater. This also gives urban runoff direct access to Cabin Creek.

Photo below is along W. Quilly St in Griffin. September 22, 2011.

Culvert view of the same location along W. Quilly St in Griffin.

Photo below shows a direct view of Cabin Creek along W. Quilly St. September 22, 2011.

Photo below is taken from the intersection of N. 12th Street and Wheeler St.

Photo below is downstream from N. 12th Street.

Photo taken upstream from N. 12th Street. September 22, 2011.

Photo below is from Turner Street and adjacent to the small Turner Street Park.

Photo below is downstream from the Turner Street Park.

Photo below is a tributary to Cabin Creek located near the intersection of Seago and Poplar Streets.

Photo below is the Cabin Creek tributary near Seago and Poplar Streets.

Photo below is a tributary to Cabin Creek located along Northside Drive in Griffin.

Photo below shows a pond located along Riley Circle in Griffin. The pond is filled by a tributary to Cabin Creek. September 22, 2011.

Photo below is a dry tributary to Cabin Creek taken along Ella Street.

Photo below shows the watershed signs erected by the City of Griffin.

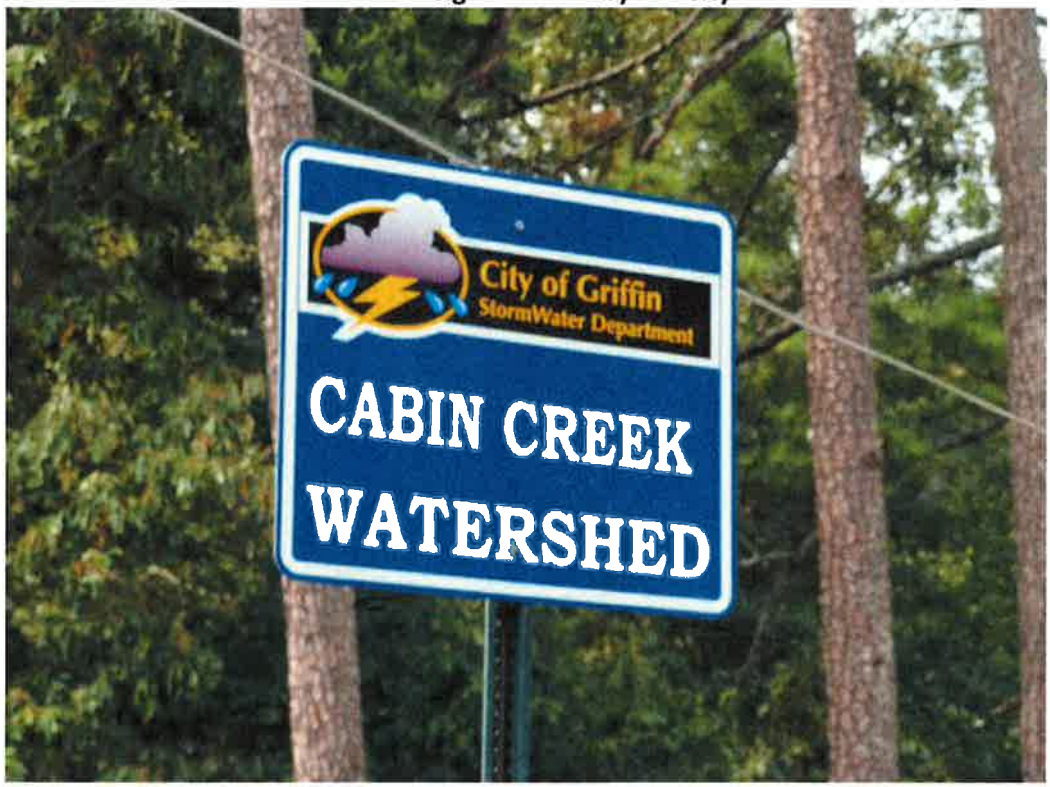


Photo below is a tributary to Cabin Creek near the intersection of Kelsey and N. 3rd Street.

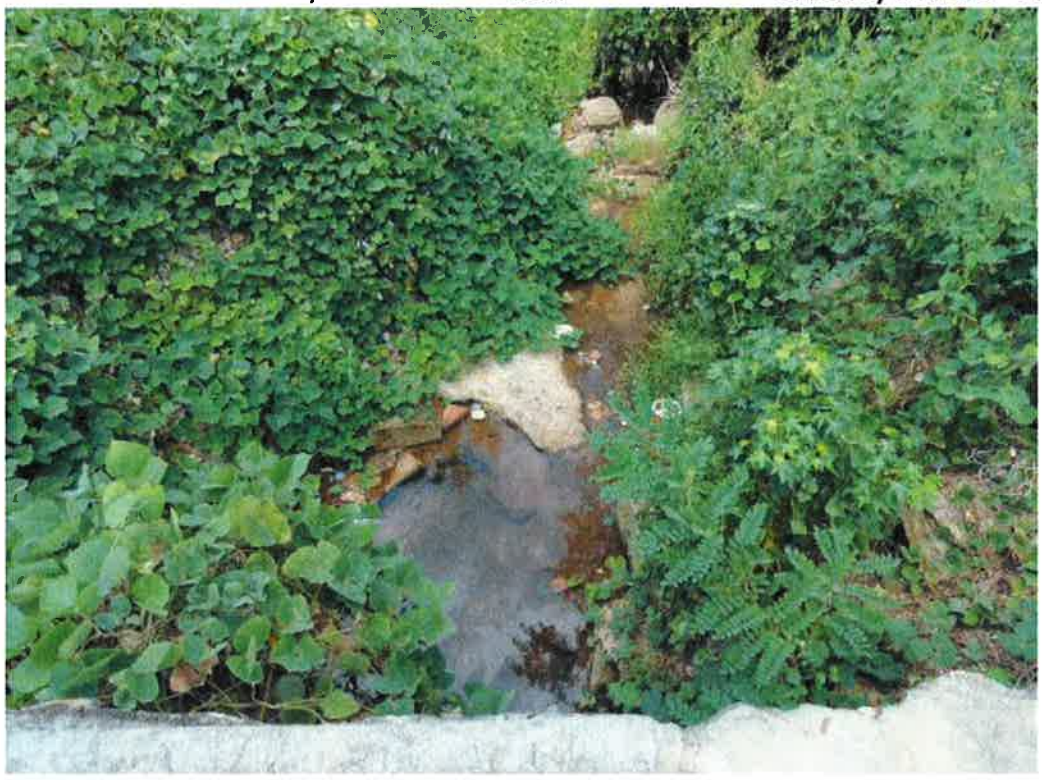


Photo below taken just north of sampling Site 1 along N. 2nd Street (Jordan Hill Road). Shown in the photo is the low density residential land use located just outside Griffin city limits.

Photo below is taken along Musgrove Road. Outside the City of Griffin the landscape becomes rural quickly. Photo shows the existence of horse farms. September 22, 2011.

Photo below is a Cabin Creek tributary located along Musgrove Road, which is currently running very low.

Photo below taken in unincorporated Spalding County, which shows the rural agricultural land use.

Photo below is located at sampling Site 2 along N. Walker Mill Road. September 22, 2011.

Photo below is located at sampling Site 3 located along GA Hwy 16 in Spalding County. September 22, 2011.

Photo below shows more of the rural landscape within the Cabin Creek watershed within Spalding County.

Photo below taken from Tomochichi Road in rural Spalding County. September 22, 2011.

Photo below is Cabin Creek at sampling Site 4 along Colwell Road in Butts County. September 22, 2011.

Photo below is Cabin Creek at sampling Site 4 along Colwell Road in Butts County. September 22, 2011.

Identification and Prioritization of Sources of Impairment:

Sources of impairment which likely cause fecal coliform contamination in the Cabin Creek watershed are identified below. The Georgia Environmental Protection Division's TMDL Report to the US Environmental Protection Agency gives greater detail as to how each source affect the contaminant levels in the stream. The list below has been prioritized according to the probable source for fecal coliform levels in the watershed.

Non-Point Sources:

Wildlife:

According to the Georgia Environmental Protection Division, the importance of wildlife as a source of fecal coliform bacteria in streams varies considerably, depending on the animal species present in the sub-watersheds. Based on information provided by the Wildlife Resources Division (WRD) of GA DNR, the animals that spend a large portion of their time in or around aquatic habitats are the most important wildlife sources of fecal coliform. Waterfowl, most notably ducks and geese, are considered to potentially be the greatest contributors of fecal coliform. This is because they are typically found on the water surface, often in large numbers, and deposit their feces directly into the water. Other potentially important animals regularly found around aquatic environments include raccoons, beavers, muskrats, and to a lesser extent, river otters and minks. Population estimates of these animal species in Georgia are currently not available.

White-tailed deer have a significant presence throughout the Ocmulgee River Basin. According to the Georgia Wildlife Resources Division, there are approximately 50 head of deer per square mile in both Spalding and Butts County.

Fecal coliform bacteria contributions from deer to water bodies are generally considered less significant than that of waterfowl, raccoons, and beavers. This is because a greater portion of their time is spent in terrestrial habitats. This also holds true for other terrestrial mammals such as squirrels and rabbits, and terrestrial birds (GA WRD, 2002). However, feces deposited on the land surface can result in the introduction of fecal coliform to streams during runoff events. It should be noted that between storm events, considerable decomposition of the fecal matter might occur, resulting in a decrease in the associated fecal coliform numbers. This is especially true in the warm, humid environments typical of the southeast.

Given the rural nature of the majority of the Cabin Creek watershed, wildlife fecal coliform contamination is likely one of the main causes for the impairment.

Agricultural Livestock:

Agricultural livestock are a potential source of fecal coliform to streams in the Cabin Creek watershed. Animals grazing on pastureland deposit their feces onto land surfaces, where it can be transported during storm events to nearby streams. Animal access to pastureland varies making fecal coliform levels differ from one area to another. Beef cattle spend most of their time in the pasture where dairy cattle are periodically confined.

Spalding County and Butts County are both agriculturally active counties. According to the local UGA cooperative extension agent there are likely 100 head of horse and cattle in the immediate Cabin Creek watershed area.

Estimated Livestock Populations							
County	**Beef Cattle**	**Dairy Cattle**	**Swine**	**Sheep**	**Horses**	**Chicken-Layers**	**Chickens-Breeders**
Butts	2750	150	150	750	1000	n/a	2750
Spalding	2750	270	68	750	n/a	208000	2750

Leaking Septic Systems:

Fecal coliform contamination can be contributed by septic system failures. There has been a substantial increase in the number of septic systems in the greater Ocmulgee River basin which includes Cabin Creek. Since the economic downturn the rate of new septic systems has decreased since 2004.

In 2004, Spalding County had 14,911 septic systems. This was an increase of 4,668 from 1990. Butts County had an increase of 5,000 from 1990 to 2004 making its total number of septic systems that year to be 8,740. Given the drought the past few years, septic system failures have been less common.

Urban Runoff:

Fecal coliform from urban areas are attributable to multiple sources, including: domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges, leaking septic systems, runoff from improper disposal of waste materials, pet waste, and leachate from both operational and closed landfills.

Urban runoff can contain high concentrations of fecal coliform from domestic animals and urban wildlife. Fecal coliform bacteria enter streams by direct wash-off from the land surface, or the runoff may be diverted to a storm water collection system and discharged through a discrete outlet structure. For large, medium, and small urban areas (populations greater than 50,000), the storm water outlets are regulated under

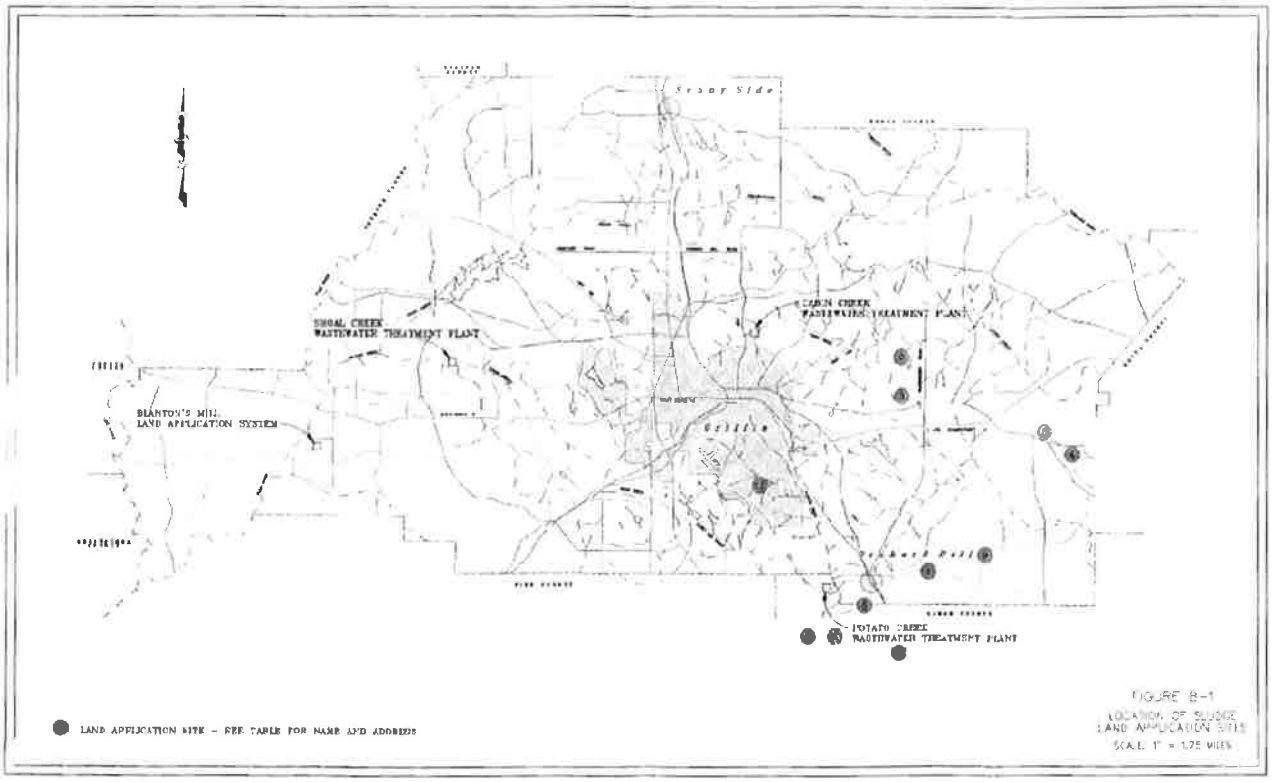
MS4 permits. For smaller urban areas, the storm water discharge outlets currently remain unregulated. The City of Griffin is permitted under a Phase II MS4.

Cabin Creek begins as an urban creek and is quite susceptible to urban runoff.

Land Application Systems:

Many smaller communities use land application systems (LAS) for treatment of their sanitary wastewaters. These facilities are required through LAS permits to treat all their wastewater by land application and are to be properly operated as non-discharging systems that contribute no runoff to nearby surface waters. However, runoff during storm events may carry surface residual containing fecal coliform bacteria to nearby surface waters. Some of these facilities may also exceed the ground percolation rate when applying the wastewater, resulting in surface runoff from the field. If not properly bermed, this runoff, which probably contains fecal coliform bacteria, may discharge to nearby surface waters.

There are approximately four LAS systems within the Cabin Creek watershed. One of which is right on the edge. Three are in Spalding County and one is in the Butts County portion of the watershed. Locations of the Spalding County LAS systems can be seen in the map below which was taken from the *Griffin/Spalding County Wastewater Management Plan 2005-2025.*



Landfills:

Leachate from landfills may contain fecal coliform bacteria that may at some point discharge into surface waters. Sanitary (or municipal) landfills are the most likely to serve as a source of fecal coliform bacteria. These types of landfills receive household wastes, animal manure, offal, hatchery and poultry processing plant wastes, dead animals, and other types of wastes. Older sanitary landfills were not lined and most have been closed. Those that remain active and have not been lined operate as construction/demolition landfills. Currently active sanitary landfills are lined and have leachate collection systems. All landfills, excluding inert landfills, are now required to install environmental monitoring systems for groundwater and methane sampling.

There is one active landfill in the Cabin Creek watershed. The Pine Ridge Recycling (MSWL) Landfill is a Municipal Solid Waste facility located in Butts County off of Bailey Jester Road.

Point Sources

Wastewater Treatment Facilities:

Industrial and municipal treatment facilities have NPDES permits with effluent and discharge limits. The EPA has developed technology-based guidelines, which establish minimum standard of pollution control for municipal and industrial discharges without regard for the quality of the receiving stream. These discharges contribute to the fecal coliform levels but to the minimum extent possible. When performing correctly and without failures, these systems are not major contributors to fecal coliform contamination.

There is one NPDES permitted wastewater treatment facility in the Cabin Creek watershed. The Cabin Creek Wastewater Treatment Plant (WWTP), NPDES GA0020214, discharges an estimated 0.83 MGD into the stream. They are permitted to discharge up to 1.5 MGD. The fecal coliform counts discharged into the stream have a monthly average of 200 CFU per 100/mL and a weekly average of 400 CFU per 100/mL.

A map of the Cabin Creek WWTP is on the following page.

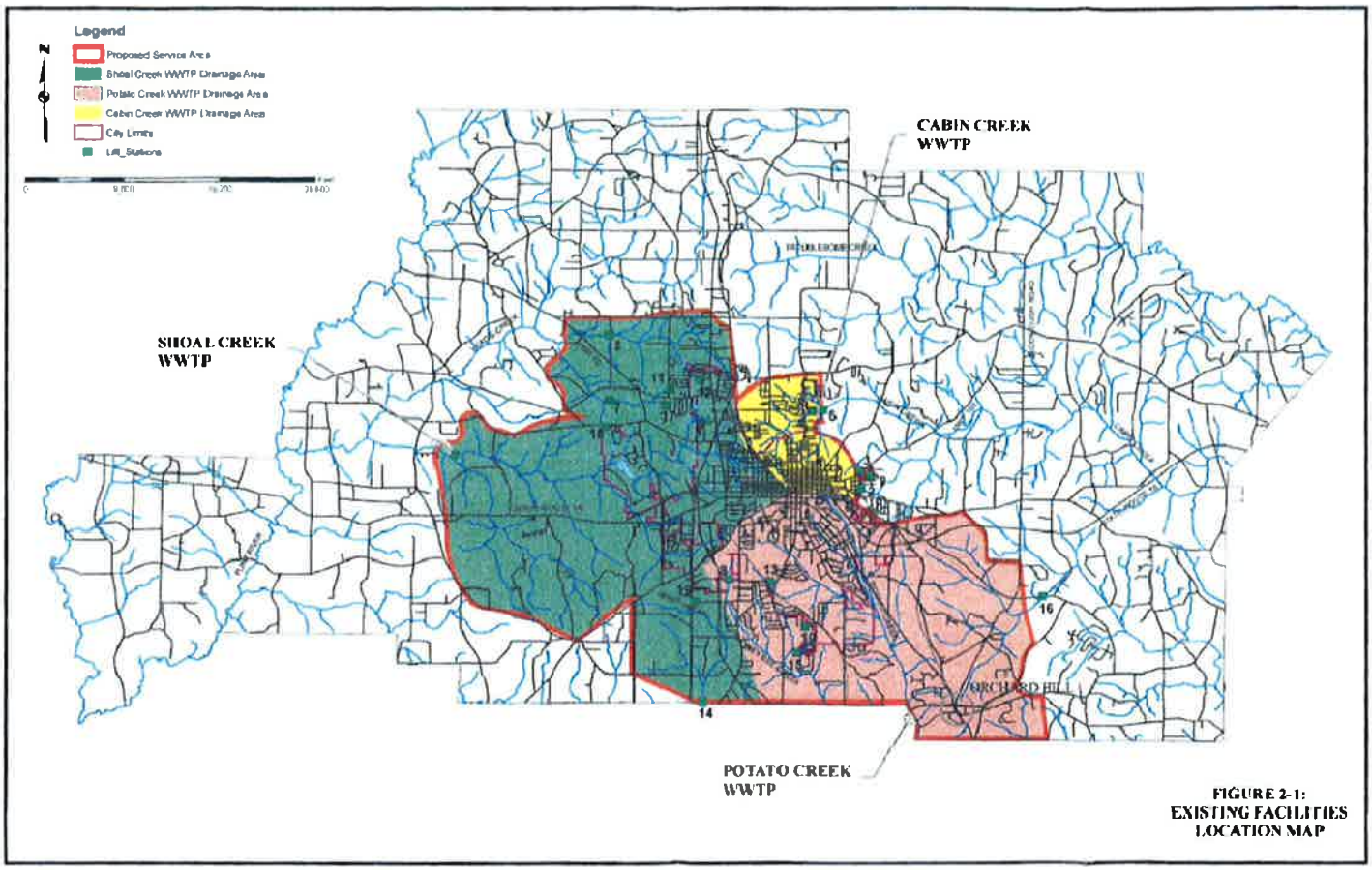


FIGURE 2-1:
EXISTING FACILITIES
LOCATION MAP

One other NPDES permitted treatment facility was located at Springs Industries (GA0003409) in the City of Griffin. That operation has since closed.

Leaking Sewer Lines:

There have been no reported major sewer line breaks or leaks in recent years. The portion of Cabin Creek watershed which lies within sewer coverage area has had approximately 5,000 feet of line repaired.

Identification of Applicable Existing Management Practices and Controls:

Agricultural Management Practices

Below are Best Management Practices (BMPs) measures currently utilized in both Spalding and Butts County. These practices are not specific to the Cabin Creek watershed.

BMP Practice	Responsible Party	BMP Description	Funding Source	Source of Impairment	Date	BMP LRP Rating
Forage & Biomass Planting (512)	NRCS, Agricultural Producer	a management strategy that reduces soil erosion and improves water quality by establishing native or introduced forages in fields or pastures	Various	Ag	2011	3-5
Fencing (382)	NRCS, Agricultural Producer	Barriers installed to limit animal, human and wildlife entry into specified areas and water resources.	Various	Ag	2011	3-5
Nutrient Management (590)	NRCS, Agricultural Producer	A management plan that assists producers in improving management and nutrient use by matching needs more efficiently and reducing nutrients in runoff.	Various	Ag	2011	1-3
Pipeline (516)	NRCS, Agricultural Producer	A component of an alternative water system used to transport water for livestock or recreation purposes.	Various	Ag	2011	1-5

General Management Practices and Controls

Governments within the watershed have certain policies and protections.

- *Griffin/Spalding County Wastewater Management Plan.* A Joint city and county management plan to assess and properly manage its wastewater treatment operations. Cabin Creek watershed is directly affected by any policy.

- *City of Griffin Comprehensive Plan 2004-2024.* The plan has policies in place to protect the community's natural resources.

"These resources are valued within the city and their proper stewardship and edification is important to the residents of Griffin. This plan incorporates these values throughout the planning process. It also seeks ways to leverage the natural and cultural resources to the benefit of the city's residents."

- *Spalding County Comprehensive Plan 2009.* The plan contains policies and action items to implement which would protect and enhance the natural resources within the County.

- *Butts County Comprehensive Plan 2005-2030.* The plan illustrates the importance of water resources and its impact on public health and well being.

- City of Griffin Soil Erosion and Sedimentation Ordinance – Revised 2009

- City of Griffin Illicit Discharge Ordinance

- City of Griffin Sewer Ordinance

- City of Griffin Stormwater Ordinance

- Spalding County Erosion and Sedimentation Ordinance

- Spalding County Illicit Discharge Ordinance

- Spalding County Sewer Ordinance

- Butts County Wetland Ordinance

- Butts County Erosion and Sedimentation Ordinance

- Butts County Zoning Ordinance – Towaliga Watershed District Overlay

- Butts County Stormwater Management Ordinance

Recommendations for Additional Management Practices and Controls:

Agricultural

There are many more BMPs and conservation/protective measures which can be utilized in the watershed to alleviate fecal coliform contaminates from entering the creek. The local Natural Resources Conservation Service (NRCS) office can assist with the implementation of additional management measures. These measures are described in detail within the *Best Management Practices for Georgia Agriculture Manual* produced by the Georgia Soil and Water Conservation Service.

Additional agricultural best management practices offered through the NRCS are listed below and on the following pages.

BMP Practice	Responsible Party	BMP Description	Purpose
Manure Storage Facility (313)	NRCS Agricultural Producer	a storage facility constructed to temporarily store waste, wastewater and contaminated runoff as part of an agricultural waste management system	Animal Waste Management
Animal Mortality Facility (316)	NRCS Agricultural Producer	a permanent structure used to dispose of carcasses used as part of a waste management plan	Animal Waste Management
Composting Facility (317)	NRCS Agricultural Producer	a facility used to dispose of carcasses and waste in a sanitary method that results in a usable soil additive by-product	Animal Waste Management
Contour Farming (330)	NRCS Agricultural Producer	a planting system of tilling, planting and performing farming operations on or near the contour of a field to reduce erosion and runoff	Non-Point Source Pollution Control
Contour Buffer Strip (332)	NRCS Agricultural Producer	strips of permanent vegetation established on a field's contour to reduce erosion, slow sediment transport and reduce runoff	Non-Point Source Pollution Control
Critical Area Planting (342)	NRCS Agricultural Producer	the establishment of permanent vegetation or cover on highly erodible land in order to reduce soil erosion	Animal Waste Management
Conservation Tillage-Mulch Till (345)	NRCS Agricultural Producer	a conservation tillage system in which residue is maintained on fields year-round and the	Non-Point Source Pollution Control

		entire field is tilled prior to planting	
Conservation Tillage-Ridge Till (346)	NRCS Agricultural Producer	a conservation tillage system in which residue is maintained on fields year-round and crops are grown on pre-formed ridges that are alternated with furrows with residue	Non-Point Source Pollution Control
Waste Treatment Lagoon (359)	NRCS Agricultural Producer	a treatment facility constructed to biologically treat waste, wastewater and contaminated runoff as part of an agricultural waste management system	Animal Waste Management
Closure of Wastewater Impoundment (360)	NRCS Agricultural Producer	the closure of lagoons and waste storage ponds that are no longer used for their original purpose	Animal Waste Management
Anaerobic Digester-Ambient Temp (365)	NRCS Agricultural Producer	an unheated waste treatment impoundment that biologically treats waste as part of a waste management system	Animal Waste Management
Anaerobic Digester-Controlled Temp (366)	NRCS Agricultural Producer	a managed temperature waste treatment impoundment that biologically treats waste as part of a waste management system	Animal Waste Management
Waste Facility Cover (367)	NRCS Agricultural Producer	a component of an animal waste management system used to maintain the capacity of and limit rainfall entering storage facilities to improve water and air quality	Animal Waste Management
Riparian Herbaceous Cover (390)	NRCS Agricultural Producer	the establishment of grasses, grass-like plants and forbs adjacent to water bodies to protect water quality, provide wildlife habitats and to stabilize stream banks and channels	Non-Point Source Pollution Control
Riparian Forest Buffer (391)	NRCS Agricultural Producer	the establishment of primarily trees and/or shrubs adjacent to water bodies to protect water quality, provide wildlife habitats and to stabilize stream banks and channels	Non-Point Source Pollution Control
Filter Strip (393)	NRCS Agricultural	strips of vegetation located between cropland, grazing	Non-Point Source Pollution Control

	Producer	land or disturbed areas and water sources to protect water quality	
Use Exclusion (472)	NRCS Agricultural Producer	the restriction of animals, people or vehicles from areas to improve and protect natural resources in the area	Animal Waste Management
Spring Development (574)	NRCS Agricultural Producer	the development of a spring or seep to improve the quality, quantity and distribution of water	Non-Point Source Pollution Control
Stream Crossing (578)	NRCS Agricultural Producer	a structure that is designed to protect quality and reduce erosion by designating stable access points and crossings for livestock	Animal Waste Management
Field Strip-cropping (586)	NRCS Agricultural Producer	a planting system in which crops are grown in alternating strips with grasses to reduce soil erosion and runoff	Non-Point Source Pollution Control
Subsurface Drain (606)	NRCS Agricultural Producer	an underground drain used to collect and remove excess water	Non-Point Source Pollution Control
Manure Transfer (634)	NRCS Agricultural Producer	a manure transport system that utilizes a conveyance system to transport manure to storage facilities, loading areas or agricultural land	Animal Waste Management
Wastewater Treatment Strip (635)	NRCS Agricultural Producer	a strip of herbaceous cover used to reduce sediment and nutrient loadings as part of an agricultural waste management system	Animal Waste Management
Water Well (642)	NRCS Agricultural Producer	a component of an alternative water supply used to provide water for irrigation, livestock, wildlife or recreation purposes	Animal Waste Management

Urban

Additional management practices to control fecal coliform from entering the Cabin Creek watershed within the urbanized areas could include those discussed in *The Use of Best Management Practices (BMP) in Urban Areas Guide.*

http://cfpub.epa.gov/npdes/stormwater/urbanbmp/bmpeffectiveness.cfm

http://www.bmpdatabase.org/

http://www.epa.gov/nrmrl/pubs/600r04184/600r04184.pdf

Comprehensive

Additional management practices which are in place and are enforced on the local government level include:

Spalding County Short Term Work Program				
Management Measure	**Years**	**Responsible Party**	**Estimated Cost**	**Funding Source**
Adopt wider minimum stream buffer requirements (75 to 100 feet)	2008 - 2009	Spalding County Community Development Department	$0.00	County Budget
Conduct a watershed management study in conjunction with GA DNR to identify needed ordinances, education efforts, enforcement improvements, and stormwater management.	2009 - 2010	Spalding County Environmental Resources Coordinator	$100,000	County Budget
Conduct a feasibility study for the creation of a stormwater utility.	2008 - 2009	County Manager's Office and Spalding County Public Works Dept.	$50,000	County Budget
Create a stormwater utility	2009 - 2010	County Manager's Office and Spalding County Public Works Dept	$200,000	County Budget
City of Griffin Short Term Work Program				
Amend zoning and land development regulations to provide incentives and guidelines for conserving open space in the subdivision process and to widen minimum stream	2005 - 2006	Planning and Development Department	N/A	City of Griffin

buffer widths				
Complete water treatment plant improvements	2002 - 2005	Water/Wastewater Department	$43,000,000	City of Griffin/Revenue Bonds
Mapping of water system	2004	Water/Wastewater Department	$300,000	Revenue bonds
Meter replacement, 2500 meters a year	2004 - 2009	Water/Wastewater Department	$340,00 per year	User fees
Water main replacement program	2004 - 2009	Water/Wastewater Department	$150,00 per year	User fees
Dewatering sludge facility	2004	Water/Wastewater Department	$400,00 per year	Revenue bonds
Ison Branch – new sewer lines	2002 - 2004	Water/Wastewater Department	$1,700,000	Revenue bonds
Sewer flow analysis study of entire system	2004	Water/Wastewater Department	$300,000	Revenue bonds
GPS Sewer System	2003 - 2004	Water/Wastewater Department	$500,000	Revenue bonds
Sewer Rehab Phase IV	2004 - 2005	Water/Wastewater Department	$1,300,000	Revenue bonds
Rehab Water/Wastewater/Stormwater Lab	2004	Water/Wastewater Department	$150,000	Revenue bonds
Jet Vac Sewer Lines	2004 - 2005	Water/Wastewater Department	$340,000 for first year (2004), $100,000 year after (2005)	User fees
Work with the County and the Water and Sewer Authority on updating the Water Supply Study and the Wastewater Management Master Plan to be consistent with the new Land Use Plan	2005 - 2007	Water and Sewer Authority, City Water and Wastewater Dept., County Manager, City Manager	$500,000	User fees, Spalding County, City of Griffin
Phase II NPDES City Implementation Program	2004 - 2009	Griffin Public Works and Utilities Department	$375,000/year	User fees
USGS Monitoring - 7 stream gauges	2004 - 2009	Griffin Public Works and	$55,000/year	User fees

		Utilities Dept		
New Stormwater Management Plan and associated projects	2009 – long term	Griffin Public Works and Utilities Dept.	N/A for study, implementation est. cost $8 million	User fees

Partnership Advisory Council and Public Involvement

A series of meetings with the PAC were held during the Extended Revision phase of the Cabin Creek Project. A meeting of the Cabin Creek Partnership Advisory Committee for the first Phase of the WIP was held on September 28th 2010. An additional meeting during Phase II was held September 23rd, 2011.

The public is highly involved in the comprehensive policy making process and periodically educated on agricultural management practice options. Future Adopt-A-Stream groups will be citizen driven and allow those participating to take a direct interest in the watershed.

Meeting Summaries

During the Watershed Improvement Plan phases meetings were held to discuss the seasonal water quality sampling events. Current and possible future management measures were discussed along with various other watershed trends and issues.

- The City of Griffin Stormwater Department conducts extensive water quality monitoring, which includes fecal coliform. This is only within the City of Griffin sewer coverage area.
- There have been no sewer line leaks recently.
- The City of Griffin has upgraded approximately 5,000 feet of sewer line.
- The City of Griffin has recently adopted a pet waste ordinance.
- Springs Industries, a significant NPDES permitted business is no longer in operation
- The sanitary landfill in the Cabin Creek watershed is highly regulated and not a probable cause of fecal coliform contamination
- Land use within the watershed has not changed significantly since 2005.
- Source tracking is a much needed step to see where fecal coliform contamination is coming from.
- The current 319(h) grant currently being implemented is for the nearby Potato Creek. Similar grant funds should be utilized for Cabin Creek.

Implementation Strategy:

The implementation of the Watershed Improvement Plan will take place with the following action steps:

- Enforce current environmental protection ordinances and natural resource protection policies which the governments which reside within the Cabin Creek Watershed.
- Continue to implement stormwater best management practices.
- Educate farmers of available best management practices available to them which keep fecal coliform from entering waterways within the watershed.
- Educate homeowners about watershed stewardship, specifically their septic system and how to maintain the system properly.
- Partner with other agencies and governments on watershed wide projects.
- Continue Adopt-A-Stream group efforts within the watershed. Establishing a Cabin Creek group would be especially important within the Butts County portion of the watershed.
- Utilize Georgia Environmental Protection Division 319(h) Grants for projects to assist with projects aimed at watershed improvement and protection. The Potato Creek project currently being administered is an example. This particular project addresses septic systems, pet waste, and agriculture. The Potato Creek watershed is directly adjacent to the Cabin Creek watershed.

Supporting Documents:

- Cabin Creek TMDL Implementation Plan 2003
- City of Griffin Comprehensive Plan 2004-2024
- City of Griffin Cabin Creek Monitoring Plan 2009
- City of Griffin Cabin Creek Watershed Assessment 2009
- Spalding County Comprehensive Plan Update 2009
- Butts County Comprehensive Plan
- Griffin/Spalding Wastewater Management Plan
- USDA NRCS PRS Report 2011
- Griffin, Spalding County, Butts County Codes of Ordinances

Attachments:

Visual Field Survey Sheets
Meeting Agenda
Sign-In Sheets
Coliscan Easygel Procedures

Visual Field Survey Sheets

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Cabin Creek **Visual Field Survey**

Date: 9-15-11 **Arrival Time:** 11:06

Site Location 12th & Wheeler St's - Coffin

GPS Coordinates (if taken) _____ & _____

Current Weather Sunny **Time Since Last Rain** 7-12

Team Members: Paul Jarrell and Alex Pfattegraff

Notes (point to/reference applicable activity on map):

- Adjacents to old mill
- Turn of the century neighborhood
- High amounts of trash in stream
- Vegitation is heavy
- Stream flow steadey but low

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☐; run ☐, riffle☐; other_____.

Flow Stage: High☐; medium ☑; low ☐; dry☐.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☑; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☐; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☑; other algae.

Algal Growth—Description & Extent: _____.

Sediment: Eroded banks ☐; mid-channel bars ☐; recent sediment deposition on banks ☐; other

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Calvin Creek **Visual Field Survey**

Date: 9-15-11 Arrival Time: 11:20

Site Location 10th / Central St. / Palace

GPS Coordinates (if taken) _____ & _____

Current Weather Sunny Time Since Last Rain > 72

Team Members: Paul Darrell + Alex Pfaltzgraff

Notes (point to/reference applicable activity on map):

- Stream parallel to street
- Moderate amounts of trash
- Close to the start of the stream.
- Slow but steady flow
- Direct stream access to street runoff (pic)
- Moderate amount of impervious surfaces
- central St slopes down towards creek channel
- water clear with much algae

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☐; run ☑, riffle☐; other_____.

Flow Stage: High☐; medium ☑; low ☐; dry☐.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☐; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☐; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☐; other _____.

Algal Growth—Description & Extent: Colors 40%.

Sediment: Eroded banks ☐; mid-channel bars ☐; recent sediment deposition on banks ☐; other

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Cabin Creek Trib. **Visual Field Survey**

Date: 7-15-11 **Arrival Time:** 11:53

Site Location Seago & Poplar St

GPS Coordinates (if taken) _____ & _____

Current Weather Sunny **Time Since Last Rain** > 72

Team Members: _____

Notes (point to/reference applicable activity on map):

- Streams flow moderate
- Heavy amounts of trash
- Heavy vegitation & tree cover
- Housing close by up a hill
- water clear

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☑; run ☐, riffle☐; other_____.

Flow Stage: High☐; medium ☑; low ☐; dry☐.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☑; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☑; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☐; other _____.

Algal Growth—Description & Extent: Minimal.

Sediment: Eroded banks ☑; mid-channel bars ☑; recent sediment deposition on banks ☐; other

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Cabin Creek Trib. **Visual Field Survey**

Date: 9-15-11 **Arrival Time:** 1:32

Site Location N. 3rd St & Kelsey Ave

GPS Coordinates (if taken) _____ & _____

Current Weather Sunny **Time Since Last Rain** > 72

Team Members: Paul Jarrell & Aldo Pfaltzgraff

Notes (point to/reference applicable activity on map):

- Heavily Vegetated - Kudzu
- Clear water
- Moderate amount of trash

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☐; run ☑; riffle☐; other_____.

Flow Stage: High☐; medium ☐; low ☑; dry☐.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☐; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☑; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☐; other _____.

Algal Growth—Description & Extent: _____.

Sediment: Eroded banks ☐; mid-channel bars ☐; recent sediment deposition on banks ☐; other

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Cabin Creek Trib. **Visual Field Survey**

Date: 9-15-11 **Arrival Time:** 12:06

Site Location Musgrove Rd

GPS Coordinates (if taken) _____ & _____

Current Weather Sunny **Time Since Last Rain** 7-7-2

Team Members: Paul Jarrell & Alex Pfaltzgraff

Notes (point to/reference applicable activity on map):

This Cabin Creek Tributary was completely dry.

Area is heavily vegatated

Land use - rural residential

Stream a substaintial tributary when flowing

Horse owners nearby

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☐; run ☐, riffle☐; other_____.

Flow Stage: High☐; medium ☐; low ☐; dry☑.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☐; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☐; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☐; other _____.

Algal Growth—Description & Extent: _____.

Sediment: Eroded banks ☐; mid-channel bars ☐; recent sediment deposition on banks ☐; other

Show stream or road segment & landmarks (crossing stream or road) or distances marking the upper & lower end of segment. If a stream, show the direction of flow, ponds or swampy areas, & estimate the width of the riparian corridor from each bank. Use an arrow to show the approximate direction of north. Show & describe (in the notes section) major adjoining land activities (see attached table) & show the location of specific potential sources & describe in the notes section. Show the direction and number of photographs taken.

Stream or Road Segment Map Or Drawing

Cabin Creek **Visual Field Survey**

Date: 9-15-11 **Arrival Time:** 2:29

Site Location Tomochichi Road

GPS Coordinates (if taken) ____ & ____

Current Weather Sunny **Time Since Last Rain** >72

Team Members: Paul Jarrell and Alex Pfaltzgraff

Notes (point to/reference applicable activity on map):

Land Use - very rural Agriculture & vacant land

Close to the GA Hwy 16 corridor

Stream flow low but steady

Some bank erosion & log debris

STREAM CONDITIONS @ ROAD CROSSINGS (Check as appropriate)

Channel Type: Swamp ☐; pool ☐; run ☑; riffle☐; other_____.

Flow Stage: High☐; medium ☐; low ☑; dry☐.

Odors: None/normal ☑; sewage ☐; petroleum ☐; chemical ☐; chlorine ☐; rotten egg ☐; animal waste ☐; other_____.

Water Clarity: Clear ☑; tea-colored ☐; cloudy ☐; opaque ☐; red or brown from sediment ☐; other_____.

Water Surface: None ☑; slick ☐; oil sheen ☐; oil sheen—breaks into plates ☐; globs ☐; flecks ☐; foam ☐; other _____.

Algal Growth—Description & Extent: _____.

Sediment: Eroded banks ☐; mid-channel bars ☐; recent sediment deposition on banks ☐; other

Meeting Agenda

ThreeRivers
REGIONAL COMMISSION

Cabin Creek Watershed Improvement Plan
Planning Advisory Council/Stakeholder Meeting
Friday, September 23, 2011
@ 10:00 A.M.

AGENDA

I. Welcome

II. Water Quality Monitoring – Summer 2011

III. Visual Field Surveying

IV. Best Management Practices and Measures

V. Other Watershed Issues

VI. Other Questions/Discussion

VII. Adjourn

Sign-In Sheets

Cabin Creek Watershed Improvement Plan
Partnership Advisory Council/Stakeholder Meeting Sign-In Sheet
September 23, 2011

Cabin Creek PAC / Stakeholder Meeting
9-23-11

Sheila Daniell	sdaniell@cityofgriffin.com
Chris Edelstein	cedelstein@cityofgriffin.com
JAMES BEASLEY	JBEASLEY@CITYOFGRIFFIN.COM
Wade Hutcheson	hutch@uga.edu

Cabin Creek Watershed Improvement Plan
Partnership Advisory Council/Stakeholder Meeting Sign-In Sheet
September 28, 2010

Cabin Creek WIP Meeting 9-28-10

NAME	ORG	Email	#
Paul Jarrell	TRC	"	"
Alexa Robinson	4-H	adrob@uga.edu	770-464-4225

Coliscan Easygel Procedures

Detection of Waterborne Coliforms and Fecal Coliforms with Coliscan® Easygel®

Introduction

The Coliscan Easygel medium is a patented formulation for water testing. It contains a sugar linked to a dye which, when acted on by the enzyme β-galactosidase (produced by coliforms including *E. coli*), turns the colony a pink color. Similarly, there is a second sugar linked to a different dye which produces a blue-green color when acted on by the enzyme β-glucuronidase. Because E. coli produces both β-galactosidase and β-glucuronidase, *E.coli* colonies grow with a purple color (pink + blue). The combination of these two dyes makes possible the unique ability to use one test to differentiate and quantify coliforms and *E. coli*. (Because *E. coli* is a member of the coliform group, add the number of purple colonies to the number of pink colonies when counting total coliforms.)

Instructions

1. Either collect your water sample in a sterile container and transport the water back to the test site, or take a measured water sample directly from the source and place directly into the bottle of Coliscan Easygel. Water samples kept longer than 1 hour prior to plating, or any Coliscan Easygel bottle that has had sample placed into it for transport longer than 10 minutes, should be kept on ice or in a refrigerator until plated.

2. Label the petri dishes with the appropriate sample information. A permanent marker or wax pencil will work.

3. Sterilely transfer water from the sample containers into the bottles of Coliscan Easygel (Consult the following table for rough guidelines for inoculum amount). Swirl the bottles to distribute the inoculum and then pour the medium/inoculum mixtures into the correctly labeled petri dishes. Place the lids back on to the petri dishes. Gently swirl the poured dish until the entire dish is covered with liquid (but be careful not to splash over the side or on the lid).

Inoculation of Coliscan Easygel

Water Sources	Inoculum Amount
Environmental: River, lake, pond, stream, ditch	1.0 to 5.0 mL
Drinking water: Well, municipal, bottled	5.0 mL

4. The dishes may be placed right-side-up directly into a level incubator or warm level spot in the room while still liquid. Solidification will occur in approximately 45 minutes.

5. Incubate at 35° C (95° F) for 24 hours, or at room temperature for 48 hours. (see Comments on incubation)

6. Inspect the dishes.
   a. Count all the purple colonies on the Coliscan dish (disregard any light blue, blue-green or white colonies), and report the results in terms of *E. coli* or Fecal Coliform per mL of water.
      Note: To report in terms of *E. coli* or Fecal Coliform per 100 mL of water, first find the number to multiply by:
      1. Divide 100 by the number of mL that you used for your sample.
      2. Multiply the count in your plate by the result obtained from #1.
         e.g. For a 3 mL sample, 100 / 3 = 33.3. So 4 *E. coli* colonies multiplied by 33.3 will be equal to 133.2 *E. coli* per 100 mL of water.
   b. Count all the pink and purple colonies on the Coliscan dish (disregard any light blue, blue-green or white colonies) and report the results in terms of coliforms per mL of water.

7. Do one of the following prior to disposal in normal trash:
   a. Place dishes and Coliscan bottles in a pressure cooker and cook at 15 lbs. for 15 minutes.(This is the best method.)
   b. Place dishes and Coliscan bottles in an oven-proof bag, seal it, and heat in an oven at 300° F for 45 minutes.
   c. Place dishes and Coliscan bottles in a large pan, cover with water and boil for 45 minutes.
   d. Place 5 mL (about 1 teaspoon) of straight bleach onto the surface of the medium of each plate. Allow to sit at least 5 minutes. Place in a water-tight bag and discard in trash.

Comments on Incubation

Micrology Laboratories, LLC. in-house studies indicate that **Coliscan** can effectively differentiate general coliforms from ***E. coli*** when incubated at either room temperatures or at elevated temperatures (such as 90-98° F). However, some further explanation may be helpful.

There is no one standard to define room temperature. Most would consider normal room temperature to vary from 68-74° F, but even within this range the growth of bacteria will be varied. Members of the bacterial family **Enterobacteriaceae** (which includes coliforms and ***E. coli****) are generally hardy growers that prefer higher than room temperatures, but which will grow at those temperatures. They tend to grow at a faster rate than most other bacterial types when conditions are favorable. It is therefore logical to try to place inoculated dishes in a "warm" place in a room for incubation if a controlled temperature incubator is not available. It is a very easy task to make an adequate incubator from a box with a 40-60 watt bulb in it to provide heat at an even rate. One can also use a heat tape such as is used to prevent the freezing of pipes in the winter as your heat source.

Our general instructions indicate that incubation times for coliforms (including ***E. coli***) are generally 24-48 hours at elevated temperatures (90-98° F) and 48 or more hours at room temperatures. At elevated temperatures, no counts should be made after 48 hours as any coliforms present will be quite evident by that time and if new colonies form after 48 hours they are most likely not coliforms, but some other type of slow growing organism that should not be included in your data. At room temperatures, the best procedure is to watch the plates by checking them at 10-12 hour intervals until you observe some pink or purple colonies starting to form and then allowing another 24-30 hours for the maturation of those colonies. Since the coliforms (including ***E. coli***) are generally the fastest growing organisms, these will be the first to grow and be counted. Colonies that may show up at a later time are likely to not be coliforms. As you can see, there are advantages to incubating your dishes at elevated temperatures. First, you can count the results earlier. At 95° F, it is often possible to do accurate counts at 18-20 hours of incubation. There is also less probability of variation from batch to batch when the incubation temperatures are kept at one uniform level. And a higher incubation temperature will tend to inhibit the growth of non-coliforms that may prefer lower temperatures.

****E.coli*** is the primary fecal coliform, however, ***Klebsiella*** is sometimes of fecal origin. Other general coliform genera include ***Enterobacter*** and ***Citrobacter.***

Interpretation of Results

This test method utilizes well established, widely accepted criteria for the recognition of coliforms and *E. coli* and proper application of the method will result in accurate results Therefore, if you suspect that your water is dangerously contaminated based on the results you get using Coliscan Easygel, you should contact your local health department and ask for their help in performing an official assessment of the water.

Non-fecal coliforms are widely distributed in nature, being found both as naturally occurring soil organisms, and in the intestines of warm-blooded animals and humans. Fecal coliforms are coliforms found naturally only in the intestines of warm-blooded animals and humans. Fecal coliform contamination is therefore the result of some form of fecal contamination. Sources may be either animal or human.

General Notes on Differentiating Coliforms and *E. coli*

Generally, water containing *E. coli* (the fecal contamination indicator organism) should not be used for drinking water unless it is sanitized in some manner. Contact your local health department for guidelines regarding *E. coli* and coliforms in recreational waters. Inform them if you suspect that contamination may be occurring from a specific source.

Colonies which have the blue-green color are not exhibiting any β-galactosidase activity (which is evidenced by the pink color). Because of this, they are not considered to be either coliforms or *E. coli* and therefore should be ignored when counting your coliform or *E. coli* colonies. Similarly, colonies which are white are exhibiting neither color-causing enzyme, and should also be ignored.

Colonies on the surface of the plate are exposed to the medium on only the underside of the colony. This causes these colonies to appear with much less of the indicator color. *E. coli* colonies may only have a slight purple tinge to them, and it may appear only in the center of the colony with the remainder of the colony being white. Similarly, coliforms on the surface may be light pink or white with a pink center.

Micrology Laboratories, LLC.
PO Box 340 Goshen, Indiana 46527-0340 USA
Phone 574.533.3351 Fax 574.533.3370
Internet www.micrologylabs.com
E-mail info@micrologylabs.com

Cabin Creek Water Testing Sites

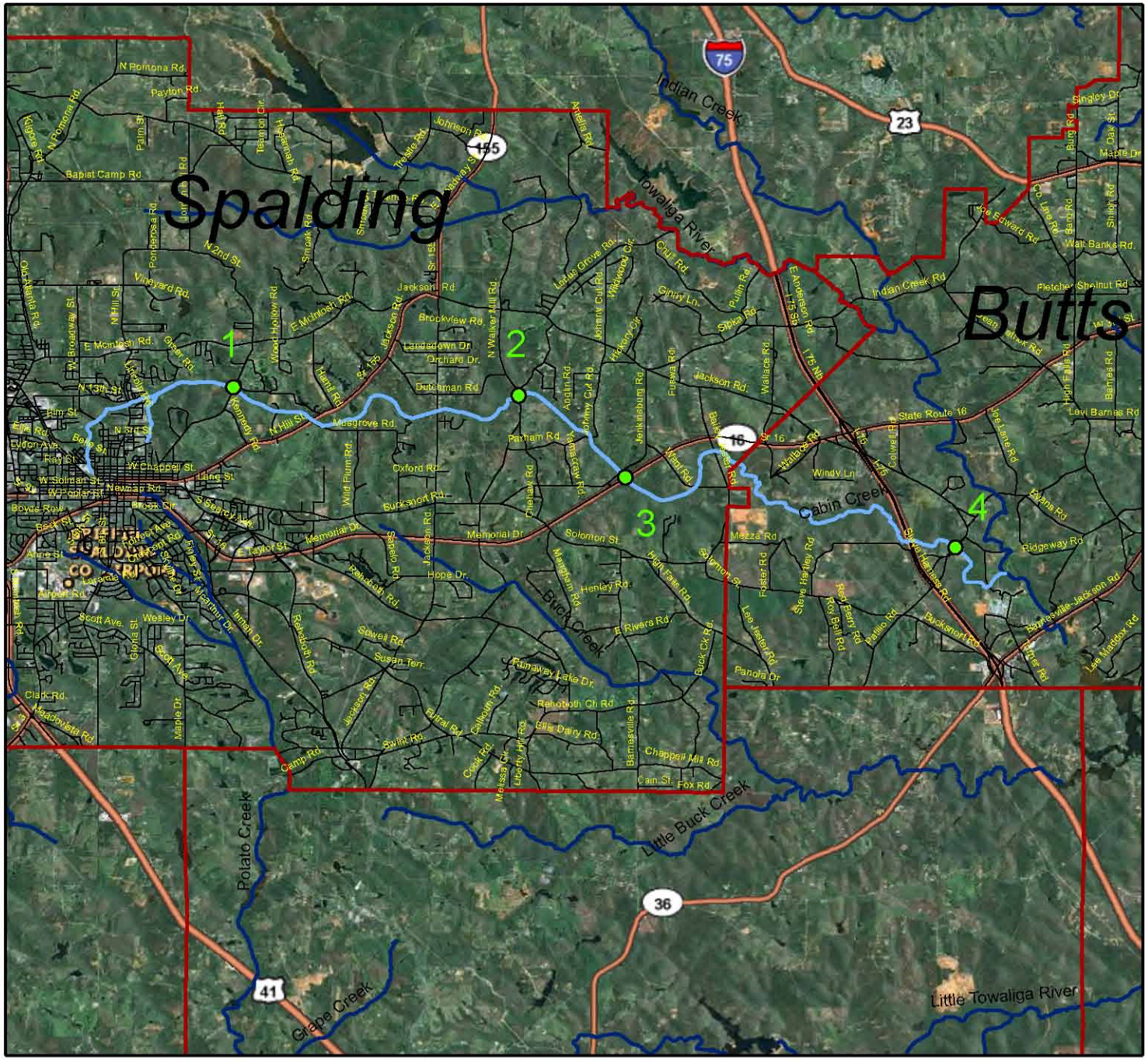


Figure 1

N

McIntosh Trail RDC
www.mtrdc.org

120 North Hill St.
P.O. Box 518
Griffin, GA 30224

Phone: 770-227-6300
Fax: 770 227 6485

Legend

- Sampling/Testing Sites
- County Boundaries
- Cabin Creek
- Surrounding Streams/Creeks
- Butts_localrds
- Spalding_localrds

Source: GA EPD 2008; U.S. Census 2008; MTRDC 2009; GDOT 2008;ESRI 2009.