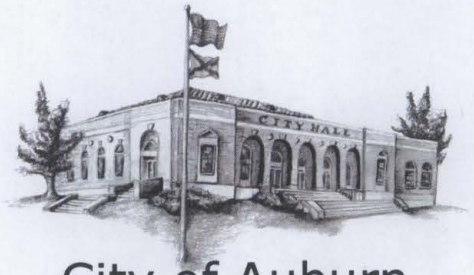
STORMWATER MANAGEMENT PROGRAM ANNUAL REPORT

PERMIT YEAR

April 2016 – March 2017

SUBMITTED IN ACCORDANCE WITH THE REQUIREMENTS OF
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

PERMIT NUMBER ALR040003



City of Auburn

Home of Auburn University

May 22, 2017

Ms. Marla Smith
MS4 Coordinator
Stormwater Management Branch, Water Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2400

SUBJECT: 2016 – 2017 PHASE II STORMWATER REPORT
PERMIT NO. ALR040003

Dear Ms. Smith:

In accordance with Part VI of NPDES Permit ALR040003 issued on September 6, 2016, the City of Auburn (City) hereby submits its annual Phase II Stormwater Report for the reporting period of April 2016 to March 2017. This report is the City's first under the current 2016 permit. This report is patterned after the program submitted to, and approved by, the Alabama Department of Environmental Management (ADEM) in March 2003 in the City's Notice of Intent (NOI), as well as the City's updated Stormwater Management Program Plan (latest revision submitted in December of 2016) . It should be noted that this report includes information about compliance operations performed under two concurrent NPDES permits and two corresponding Stormwater Management Program Plans (SWMPP).

If you have any questions, or need any additional information, please feel free to contact me at (334) 501-7367 or by email at dballard@auburnalabama.org.

Sincerely,

Daniel Ballard, PLA
Watershed Division Manager | Water Resource Management Department
City of Auburn

Enclosure
cc: File

1501 West Samford Avenue • Auburn, Alabama 36832
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City of Auburn

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CITY OF AUBURN

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT NUMBER ALR040003
MUNICIPAL STORMWATER PROGRAM ANNUAL REPORT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly fathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for fathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Bill Ham, Jr.
Mayor, City of Auburn
144 Tichenor Avenue
Auburn, Alabama 36830
(334) 501-7260

James C. Buston, III
Interim City Manager, City of Auburn
144 Tichenor Avenue
Auburn, Alabama 36830
(334) 501-7260

5/23/2017

Date

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FOREWORD:

The mission of the Watershed Division of the Water Resource Management Department of the City of Auburn is, first and foremost, to protect, preserve, and restore the chemical, biological, and physical integrity of our local water resources. And, although the City's comprehensive Stormwater Management Program is managed by the Watershed Division, the long term success of the program will ultimately be determined by its ability to strengthen the resolve and desire of the entire community toward this same objective. This report is drafted with this understanding and therefore reflects the summary of the efforts of the community of Auburn as much as it does those of the staff of the City of Auburn. Although there are many success stories and much progress made in 2016, many challenges and concerns remain, not the least of which is the continued status of impairment of three of the City's principal water resources; Saugahatchee Creek (Nutrients), Parkerson's Mill Creek (Pathogens), and Moore's Mill Creek (Siltation). We will continue to improve upon and develop our Stormwater Management Plan in the coming years, focusing on building and expanding upon the program's strengths and identifying and implementing strategies for addressing threats to our local water resources.

WATERSHED DIVISION STAFF:

Daniel Ballard, PLA | Watershed Division Manager

Education: Bachelor of Science in Zoology & Master of Landscape Architecture

Certifications/Licensure: Registered Professional Landscape Architect, Alabama #772

Dustin "Dusty" Kimbrow | Watershed Program Coordinator

Education: Bachelor of Arts in Geography (magna cum laude) & Master of Science in Geography

Certifications/Licensure: Qualified Credentialed Inspector, Alabama

Ronald "Ron" McCurry | Stormwater Coordinator

Education: Bachelor of Science in Building Science & Master of Community Planning

Certifications/Licensure: Qualified Credentialed Inspector, Alabama

STORMWATER MANAGEMENT PROGRAM
ANNUAL REPORT

City of Auburn

PERMIT YEAR
April 2016 - March 2017

PROGRAM EVALUATION & EXECUTIVE SUMMARY

The City of Auburn is now entering its fourteenth year as a regulated owner/operator of a small municipal separate storm sewer system, with the current reporting year representing the first under the newly issued Statewide General Permit ALR040003. Over ten of these past thirteen years the City's Stormwater Management Program (SWMP) has generally been managed and operated with the same number of staff and with the same operational budget. Over this same time period the City's physical infrastructure and population has continued to experience rapid growth, with the population increasing by approximately 25% every ten years. This rapid urbanization, which began many years before the promulgation of Phase II of the NPDES program, has presented challenges to the City's SWMP, both in the form of legacy impacts to our water resources and in the form of the ever-evolving dynamics of the impacts of urban and suburban growth on local hydrologic conditions. The most outward physical evidence of these challenges is the continued status of impairment of three of the City's principal water resources; Saugahatchee Creek, Moore's Mill Creek, and Parkerson's Mill Creek. Furthermore, the diversity of impairment (nutrients, siltation, & pathogens respectively) between these waters highlights the complexity and uniqueness of the impacts of urbanization on our watersheds and underscores the need for prescriptive and strategic plans for protection, preservation, and restoration. The City's SWMP provides the framework for accomplishing this through both targeted regulations and policies (ex. requirement of Water Quality Plans for developments discharging to impaired waters) and through the implementation of other targeted structural and non-structural control measures as required by the City's MS4 Permit and/or as outlined in the City's Stormwater Management Plan or any of the three approved Watershed Management Plans.

This report outlines, in detail, how the City is operating its SWMP and how it records and documents measurable success. Additionally, this report demonstrates how innovation, partnerships, collaboration, and dedication to a common mission can and have permitted the City to expand the capacity of its SWMP services to a growing population at little to no increased

costs for over a decade. These partnerships, many of which started in the formative years of the program, are the foundation of the City's SWMP and have grown to include Auburn University, Save our Saugahatchee (SOS), Friends of Chewacla Creek and Uphapee Creek (ChewUp), Alabama Water Watch (AWW), the City of Opelika, the City of Smiths Station, Lee County Highway Department, and Auburn City Schools. Some of the successes and accomplishments of the program in 2016, many of which would not be possible without these partners, include:

- Updated the City's SWMP and associated Comprehensive Stormwater Quality Monitoring Plan.

- Began the process of planning for the creation of the City's Green Infrastructure Master Plan (with the stated purpose of guiding the City's efforts toward the use of Green Infrastructure as standard practice).

- Acquired >80 acres of land and/or easements for the purpose of creating a greenway and blueway along Saugahatchee Creek (to be used as an educational tool for water resources).

- Assisted with the implementation and provided materials to the Auburn University Community Garden to install a small rain garden and cistern (280 gallon) at their facility on campus.

- Completed the renovations of the Softball Complex Streambank Stabilization Project, utilizing both hard and soft armor practices on 150 linear feet of the Parkerson Mill Creek streambank.

- Installed 150 linear feet of Flexamat articulated concrete matting along Town Creek near downtown.

- Installed 200 linear feet of Flexamat articulated concrete matting along Parkerson Mill Creek in association with a sewer stabilization project.

- Completed the development of, and implemented, a CityWorks Lot Level Erosion and Sediment Control inspection program.

- Completed the development of, and implemented, a CityWorks Outfall Inspection program.

- Authored and distributed over 22 articles directly or indirectly related to stormwater and watershed management in the City's OpenLine Newsletter, which is distributed monthly to over 21,000 customers.

- Began participating in discussions and meetings associated with Auburn University's Comprehensive Stormwater Management Policy Initiative (in part, looking for opportunities to develop interjurisdictional consistency in our approach to stormwater management).

- Partnered with the Clean Water Partnership to bring the Waters to the Sea kiosk to the City of Auburn Municipal Library.

- Expanded the City's Public Water Quality Viewer Application, whereby citizens can view, graph, and download routine surface water quality data obtained by the City.

- Purchased and installed three (3) real-time stream gages with cellular telemetry (two on Chewacla Creek and one on Saugahatchee Creek).

- Purchased and installed one (1) EXO2 real-time water quality monitoring station in Lake Ogletree.

- Purchased and installed one (1) tipping bucket, one (1) air temperature sensor, one (1) humidistat, and one (1) wind speed/wind direction sensor at Lake Ogletree.

- Partnered with Alabama Water Watch to begin coordinating and sponsoring volunteer water quality monitoring in Parkerson Mill Creek through the Auburn University's Coast Guard Auxiliary Unit.

- Continued regular quarterly meetings of the ALOAS organization.

- Maintained a very active outreach presence by giving >14 diverse presentations to a variety of different organizations.

- Maintained an active presence on the City's website and began looking at website improvements.

- Cleaned over 14,876 miles of City streets with regenerative air street sweepers, accounting for nearly 900 tons of sediment, debris, and trash removed from City streets.

- Recycled over 18,000 pounds of household hazardous waste, over 2,559,000 pounds of newspaper, cardboard, glass, and plastic trash, and over 1,100 gallons of used cooking oil/grease.

- Performed >1,000 Erosion and Sediment Control inspections, resulting in 560 enforcement letters and twenty (20) 72-Hour Notices of Violation (NOV's).

- Supported and participated in numerous community education and outreach opportunities, including Earth Week, the Lee County Water Festival, storm drain marking, etc.

- Continued to implement numerous recommendations outlined in the Natural Systems section of the City's Comp Plan 2030.

- Continued the weekly monitoring of 40 stations throughout the City for turbidity, adding dissolved oxygen, temperature, pH, and specific conductance in 2016.

- Continued continuous monitoring of upstream/downstream locations with two Hydrolab DS5 multiparameter water quality sondes.

- Implemented the second year of a five year in-sourcing Source Water Monitoring Plan.

- Continued to finance USGS stream gaging operations on both Saugahatchee and Chewacla Creeks.

- Completed the fourteenth year of conservation measures outlined in the Chewacla Creek Safe Harbor Agreement.

- Reduced sanitary sewer overflows (SSO's) by over 80% over the last six years.

- Completed the second annual Citizen Stormwater Survey (See Appendix G for results)

Goals for the Upcoming Year

The Watershed Division regularly evaluates the effectiveness and efficiency of its operations, both from a permit compliance perspective as well as a mission/objectives and budgetary perspective. This allows staff to identify elements of the SWMP that are working, those that are not, and those that need or warrant modification. Staff work to continue those services that they determine effective, eliminate those that are not, and establish goals for improving those that could be. Below is a list of items determined as goals for 2017.

- Continue to increase public education and awareness through additional storm drain marking activities, involvement with our local schools and other education and outreach initiatives;

- Continue the City's new Stream Gaging Program through the installation of one (1) real-time stream gage per year until all major waterways are gaged;

- Complete the revisions of the City's Illicit Discharge Ordinance, including the addition of specific escalating enforcement actions;

- Continue to improve and promote the City's Water Quality Monitoring Public Viewer Application;

- Complete the inventory and assessment of the City's properties and facilities and develop a program for annual inspection and improvements for stormwater management;

- Continue the implementation and enhancement of the City's comprehensive water quality monitoring database that houses data from the City's various water quality monitoring programs;

- Complete the development, and begin implementation, of the City's Green Infrastructure Master Plan;

- Update the City's Site Development Review Tool, which is used for evaluating a proposed development's pollutant removal performance for compliance with applicable TMDL's;

- Install at least one Green Infrastructure practice within the City;

- Complete the design and start implementation of the H.C Morgan Stream Restoration Project;

- Complete Phase IA of the Saugahatchee Greenway + Blueway Project, which includes the first 1.5 miles of greenway trail, two kayak put-in/take-out facilities, a small pocket park, and associated parking facilities, and;

- Plan and host a sediment basin design and construction workshop to educate local engineers and contractors on proper methods for design and construction of sediment basins using skimmer devices.

I. INTRODUCTION

In response to the National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Regulations, the City of Auburn (City) applied for and received an NPDES permit for stormwater discharges from the Alabama Department of Environmental Management (ADEM) on May 14, 2003. The current permit was issued September 6, 2016 and became effective October 1, 2016. A copy of this permit (ALR040003) is included in this report.

This report is being submitted to the ADEM pursuant to Part VI; paragraph 1 of NPDES Permit ALR040003.

This annual report is the City's thirteenth report, and first (initial) under the reissued permit, and covers the reporting period from April 2016 through March 2017. The stormwater program outlined in this report is patterned after the program submitted to and approved by ADEM in March 2003 in the City of Auburn's Notice of Intent (NOI) and in accordance with the City's Stormwater Management Plan (current update submitted to ADEM in December 2016). It should be noted that the current permit became effective halfway through the current report year.

II. SITE DESCRIPTION

The City of Auburn is located in East Central Alabama. A map of the City is provided in Appendix B. The Auburn, Alabama urbanized area encompasses 59.30 square miles per the 2015 U.S. Census. Approximately 26.80 square miles of the Auburn City Limits are located within this urbanized area. The current population of Auburn is approximately 62,059 per the 2015 U.S. Census estimate. There are approximately 286 miles of creeks and streams flowing through Auburn, approximately 667 lakes, ponds, and other open waters, and +/- 370 acres of wetland. From the most recent City storm drainage system inventory, the storm drainage system contains approximately 126 linear miles of storm pipe (111.4 miles of which are owned by the City). The City is updating its stormwater infrastructure inventory on a routine basis using the City's survey crew, as well as private surveyors.

Geographic Context

The City of Auburn is situated within a unique transitional zone between the Piedmont and Coastal Plain physiographic regions of the Southeastern United States (see link below). More specifically, the City is located within the Level IV sub-ecoregion known as the Southern Outer Piedmont. This ecoregion is generally characterized as having lower elevations, less relief, and less precipitation than that exhibited in other regions of the Piedmont. Overstory cover type within this region consists mostly of mixed deciduous (oak, gum, hickory) and mixed coniferous (pines, firs, spruces, etc.) with the presence of numerous monotypic pine plantations scattered throughout. Specific to these transitional areas in the southeast is the presence of the "fall line", the geographic divide between the Piedmont and Coastal Plain. More information can be found at the link provided below. The City's presence within this transitional area between the piedmont and coastal plain regions provides for a unique hydrogeomorphic diversity of water features within a relatively small geographic area. This diversity is exemplified in the abundance and variety of stream channel features, varying substrate composition, and variety of aquatic habitats. For example, streams in central Auburn generally exhibit piedmont characteristics, such as strong riffle/pool complex formation and cobble/gravel substrate composition, yet they cascade to a coastal plain dynamic of long runs and sandy substrates as they flow to the western and southern extents of the City. Similarly, the topography of each of the contributing watersheds follows the same pattern of increasing coastal plain-like features to the west and south of the City.

Link to a map of Alabama's physiographic regions:

http://alabamamaps.ua.edu/contemporarymaps/alabama/physical/al_physio.pdf

III. KNOWN OR SUSPECTED WATER QUALITY PROBLEMS

The City's municipal separate storm sewer system (MS4) discharges into streams located in three primary (10-digit HUC) watersheds; Saugahatchee Creek Watershed, Uphapee Creek Watershed, and Chewacla Creek Watershed. Smaller watersheds of the Saugahatchee Creek Watershed to which portions of the City's MS4 discharge include the Loblockee Creek Watershed and the Little Loblockee Creek Watershed. Smaller watersheds of the Chewacla Creek Watershed to which portions of the City's MS4 discharge include Parkerson's Mill Creek, Moore's Mill Creek, and Town Creek. The only smaller watershed of the Uphapee Creek Watershed to which portions of the City's MS4 discharge include the Choctafaula Creek Watershed.

Moore's Mill Creek was placed on the draft 303(d) list in 1998 and has been listed on the final 303(d) lists from 2002 to present. Known water quality concerns within the jurisdictional area were identified as stream siltation resulting from sedimentation deriving from local development within the Moore's Mill Creek watershed and in-stream erosion. The ADEM Draft 2016 303(d) list identifies Moore's Mill Creek as a Low Priority for TMDL development. The Moore's Mill Creek Watershed Management Plan was drafted and finalized in May of 2008.

The Saugahatchee Embayment, where Saugahatchee Creek discharges into Yates Lake, was placed on the final 303(d) lists from 1996 to 2008. The Embayment was listed on the 303(d) lists primarily for nutrient enrichment. ADEM and the USEPA issued the final Total Maximum Daily Load (TMDL) for nutrients and organic enrichment/dissolved oxygen for Pepperell Branch and the Saugahatchee Embayment in April 2008. Implementation of the stormwater TMDL is addressed in the City's Phase II Permit that was issued on September 6, 2016 (effective on October 1, 2016) and the City's updated Stormwater Management Plan that was submitted to ADEM in December 2016. The Saugahatchee Watershed Management Plan was drafted and finalized in February of 2005.

Parkerson's Mill Creek, from its source to Chewacla Creek, was placed on the final 303(d) list in 2008 and 2010. Known water quality concerns within the jurisdictional area were identified as pathogens resulting from urban runoff, storm sewers, and illicit discharges. A TMDL for Parkerson's's Mill Creek was issued by ADEM in September 2011. Implementation of this stormwater TMDL is addressed in the City's Phase II Permit issued on September 6, 2016 (effective on October 1, 2016) and the City's updated Stormwater Management Plan that was submitted to ADEM in December 2016. The Parkerson's Mill Creek Watershed Management Plan was drafted and finalized in December of 2011.

IV. RESPONSIBLE PARTY

The City's Stormwater Management Program (SWMP) is implemented by several programs operating under various departments within the City's organization. Components of the SWMP and each department's respective responsibilities are as follows:

- Environmental Services Department – Operates the recycling and composting program; Operates and manages the street sweeping program; Hosts the annual Household Hazardous Waste Collection Day program;

- Parks and Recreation Department – Hosts annual Earth Day activities and conducts the annual Arbor Day Tree Giveaway program; Manages the City's Greenway/Greenspace Program;

- Planning Department – Assists with reviewing and approving low impact development projects; Manages CompPlan 2030 and future land use planning efforts;

- Public Safety Department, Codes Enforcement Division – Monitors residential and commercial construction;

- Public Works Department – Performs maintenance of stormwater infrastructure and assists with inspections of residential and commercial construction; Performs annual detention pond inspections;

- Water Resource Management Department – Monitors residential and commercial construction and conducts erosion and sediment control inspections; Manages water quality sampling program; Manages public education and outreach program; Assists the Public Works Department with annual detention pond inspections; Manages overall SWMP and compliance with Phase II Stormwater Permit.

When the City began its Phase II program, coordination and implementation of the individual SWMP was the responsibility of the Public Works Department. In October 2005, management of the stormwater program was transferred from the Public Works Department to the Water Resource Management Department, under a newly created Watershed Division. The intent of the move was to manage water supply operations, wastewater operations, and stormwater operations from a watershed perspective for all components that impact water quality within the City.

The person responsible for the coordination and implementation of the individual SWMP is as follows:

Daniel Ballard, PLA | Watershed Division Manager
Water Resource Management Department
City of Auburn
1501 West Samford Avenue
Auburn, AL 36832
(334) 501-7367
dballard@auburnalabama.org

V. STORMWATER MANAGEMENT PROGRAM COMPONENTS

The Phase II stormwater regulations require operators of small Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas to develop and implement stormwater management programs employing best management practices (BMPs) to adequately address five minimum control measures. The control measures include:

- Public Education and Public Involvement on Stormwater Impacts
- Illicit Discharge Detection and Elimination;
- Construction Site Stormwater Runoff Control;
- Post-Construction Stormwater Management; and
- Pollution Prevention/Good Housekeeping for Municipal Operations.

In March 2003, the City submitted to ADEM a Notice of Intent (NOI) to implement a SWMP under the Phase II stormwater regulations. The City's most recent update to its SWMP was in December 2016 to comply with the current Phase II Permit (submitted it to ADEM in December 2016). The goals and details of the City's program are outlined in the updated SWMP. At the end of permit year thirteen (first year under the reissued permit) all program components outlined in the SWMP have been implemented.

VI. PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

A. Articles in the City Newsletter "Open Line"

Open Line is a monthly newsletter mailed to Auburn citizens through their utility bill. Articles and messages contained in the newsletter reach a large and diverse group of citizens. The goal for articles in Open Line is to produce two (2) articles per year. During the current reporting year, a total of twenty two (22) articles were published in which stormwater related issues were highlighted or affected:

- *2016 Household Hazardous Waste Collection Day Event – April 2016*
- *Keep Auburn Beautiful this Spring! – April 2016*
- *Big Event 2016 Announcement – May 2016*
- *Trash Amnesty Week Announcement – May 2016*
- *Educational Kiosk Installed at Auburn Public Library – June 2016*
- *American Society of Civil Engineers Service Project Award – June 2016*
- *2016 Household Hazardous Waste Day Success – August 2016*
- *2015 Consumer Confidence Report Announced – September 2016*
- *Northwest Auburn Neighborhood Plan Kicks Off – October 2016*
- *City of Auburn's Erosion and Sediment Control Ordinance – October 2016*
- *Planning for the Future: Parks, Recreation, and Culture – November 2016*
- *Information Technology – GIS Division Featured in ICMA Article – December 2016*
- *The Big Event 2017 – January 2017*
- *Annual Flood Protection and Preparation (Multiple Articles) – March 2017*


Open Line

A Monthly Newsletter for City of Auburn Citizens

October 2016

City Council

Northwest Auburn Neighborhood Plan Kicks Off

Zika Update


Auburn Featured in Where to Retire Magazine

8 Mountain Retreats

2016 Safest Places in Alabama

Outstanding Planning Award

City of Auburn's Erosion and Sediment Control Ordinance

Upcoming Elections

ELECTION DAY

MEETING SCHEDULE

OCTOBER

Copies of these articles can be downloaded from the City's website at:

http://www.auburnalabama.org/openline/.

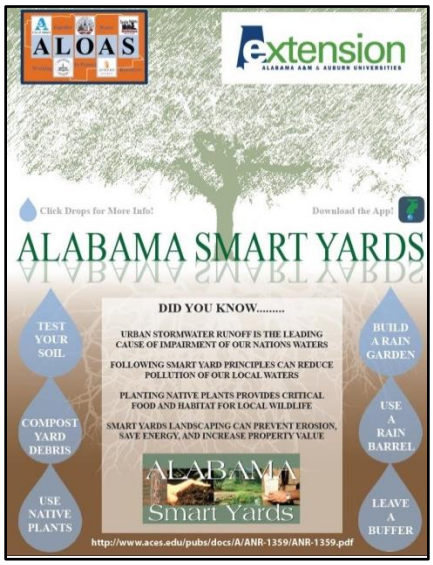
B. Brochure Publications

Pamphlets and brochures are an effective way to present and explain stormwater issues. Unlike other communication vehicles, pamphlets and brochures can be distributed in many locations without requiring staffing and the location of distribution can specifically target the audience you are trying to reach. The goal for brochure publications is to produce two (2) brochures per year. During the current reporting year, various brochures produced by Auburn University, the Clean Water Partnership, and other organizations were made available at several locations throughout the City. Brochures provided by the City over the past year include the following brochures published by the **A**uburn, **L**ee County, **O**pelika, **A**uburn University and **S**miths Station (ALOAS) Citizen Advisory Group:

Copies of these brochures can be downloaded from the City's website at:
http://www.auburnalabama.org/wrm-watershed/Default.aspx?PageID=211

Additional Brochures Made Available:

- Washing Cars (Alabama Clean Water Partnership (ALCWP))
- Changing Oil (ALCWP)
- Pets (ALCWP)
- Fertilizing (ALCWP)
- Saugahatchee Creek Watershed: Past, Present and Future (Saugahatchee Watershed Management Plan Group (SWaMP))
- Fats, Oils and Grease Recycling Program (City of Auburn)
- ALOAS brochures from previous years

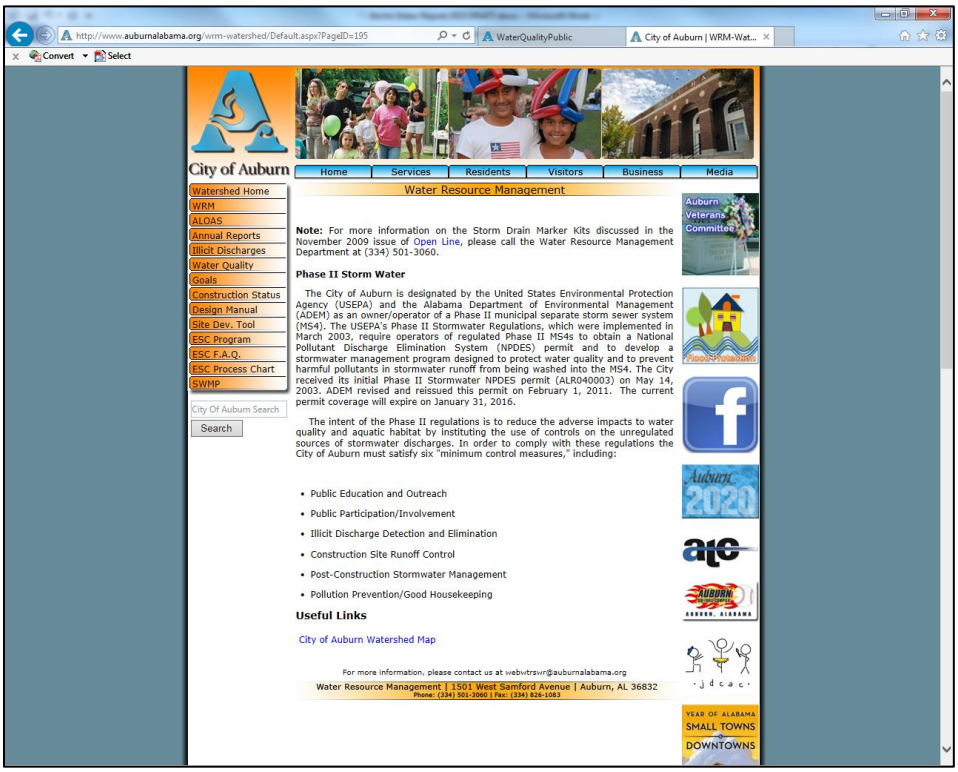


C. Website

Citizens can go to the City's website to obtain information on items of local interest. The web page is accessible 24 hours per day and can serve citizens that do not have the time or the ability to physically meet with staff during normal working hours.

The goal for the website was to develop a Phase II Stormwater section on the existing website in 2003 and post that website in 2004. This goal was met a year early when the

Phase II Stormwater website was posted in March 2003. City stormwater policies, ordinances, design manuals and links to related sites (ADEM and EPA) have been posted and are available to the public.



The City's Stormwater website was moved from the Public Works Department home page to the Water Resource Management Department home page in 2005. The Stormwater website was updated in 2016 to include updates to the public water quality viewer application for the City's various Water Quality Monitoring programs. **In 2016, the Stormwater website was visited 1,204 times by 550 unique users/viewers.**

For more information on the website please visit:

http://www.auburnalabama.org/wrm-watershed

D. Public Water Quality Viewer Application

This application, developed and launched in 2015, allows the public to view water quality data from forty (40) monitoring locations on streams throughout the City. These stations are monitored weekly by Watershed Division staff using modern water quality monitoring equipment, with the viewer application updated weekly to reflect current data. Water quality parameters analyzed and presented include Turbidity, Dissolved Oxygen,

Temperature, Specific Conductance, and pH. More information about these parameters can be found through various webpage links provided in the application. This application helps to provide transparency in our monitoring operations, facilitate educational and research opportunities for students and teachers, and provide an additional tool for citizens to become aware and involved in helping to preserve and protect our local water resources. This application can be found at:

http://webgis.auburnalabama.org/waterqualitypublic/

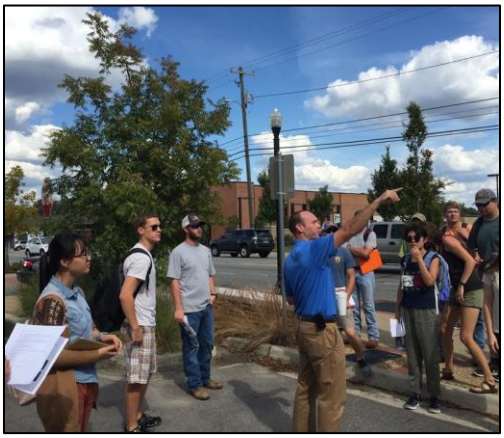
E. Public Presentations

The City provides staff and/or resources to perform presentations for various groups and public meetings. Typically presentations are offered in PowerPoint format and the topics are chosen by the organization requesting the information.

Sixteen (16) public presentations were made during the current reporting year. Presentations were given to various groups, including a Mongolian delegation of public officials, Auburn University students from various departments, City officials, and public service organizations.

Presentations prepared and provided by City staff over the past reporting year include:

- The City of Auburn's Green Infrastructure (October 2016) – Auburn University Soil Resources and Conservation Class
- CoA MS4 Partnerships & Other Things That Matter (May 2016) – Auburn University Stormwater Symposium
- The City of Auburn: Illicit Discharge Detection and Elimination (May 2016) – Auburn University Stormwater Symposium
- Chewacla Creek Safe Harbor Agreement (July 2016) – Auburn Water Works Board
- Careers in Water Resource Management (February 2016) – Auburn University Career Fair (*Not in reporting year, but not covered in previous report*)
- What Lay Beneath: An Argument for the Daylighting and Restoration of Town Creek (August 2016) – City of Auburn Management Team
- Municipal Landscape Architecture: Infrastructure as Landscape (April 2016) – Auburn University Master of Landscape Architecture Advisory Council
- Our Local Water Resources: A Watershed Perspective (January 2016) – Lee County Sunrise Rotary Club (*Not in reporting year, but not covered in previous report*)



- City of Auburn Water Resource Management Annual Operations Update (February 2016) – Save our Saugahatchee Annual Meeting (*Not in reporting year, but not covered in previous report*)
- Our Local Water Resources: A Watershed Perspective (January 2016) – Auburn University Sustainability 5000 Capstone Class (*Not in reporting year, but not covered in previous report*)
- The City of Auburn's Lake Ogletree Watershed Monitoring Program: A Data-Driven Approach to Reservoir and Watershed Management (September 2016) – Alabama Water Resources Conference
- Watershed Assessment of Disturbed Streams (October 2016) – Alabama Cooperative Extension Service Workshop
- H.C. Morgan WPCF Stream Restoration and Outdoor Classroom Project Vision (March 2017) – Alabama Clean Water Partnership Tallapoosa Basin Meeting
- Wastewater Treatment: Yesterday, Today, and Tomorrow (April 2016) – Auburn University MLA Class
- WRM Drought Update (October 2016) – Office of the City Manager
- Sustainability in Water Resource Management (March 2017) – Alabama Section of the American Society of Agricultural and Biological Engineers

F. Workshops/Training Hosted

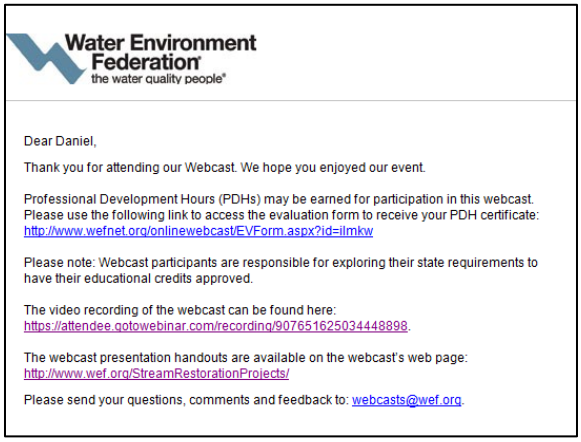
In an effort to educate contractors, developers, engineers, and staff, the City has initiated a series of workshops. The content of the workshops focuses on local stormwater issues of concern. Workshops/training hosted by the City over the past year include:

- **Erosion and Sediment Control Workshop (Re-Scheduled for August 2017)** –The purpose of this Workshop is to educate and interact with local engineers, developers and contractors who are governed by the City's Erosion and Sediment Control Ordinance, the ADEM stormwater regulations, and the United States Environmental Protection Agency (EPA) regulations. Past speakers have included experts from various government organizations, academia, and the private sector. Approximately 80-90 developers, contractors, engineers and ALOAS members attend this annual workshop. Due to scheduling conflicts, the City has rescheduled this event for August of 2017.

- **Materials Handling/Spill Prevention Training** – With the assistance of Mr. Tom McCauley, Auburn University's Environmental Risk Manager, the Water Resource

Management Department conducted an informal review of its applicable facilities for proper Spill Prevention, Control and Countermeasures (SPCC) in October 2013. The City began addressing some of the recommendations that resulted from that review in 2014, including improving general housekeeping, storage, & labeling procedures at the Bailey-Alexander Water and Sewer Complex, repainting of the above-ground fuel storage tanks at the Public Works Construction Division Facility, and annual training of two Public Works staff in Spill Prevention Control & Countermeasures. The City continued these improvements in 2016, including additional construction of vehicle and materials pole barns and improvements in the storage of fuels and other petroleum products.

- **Lunch & Learn Workshops** – The Water Resource Management Department hosted two "Lunch & Learn" Workshops in 2016. The Lunch and Learn Program is a new and ongoing education and outreach initiative (started in 2014), providing opportunities for staff from all City departments to learn about advances in research, technologies, and practices related to stormwater management. The first Lunch & Learn of 2016 invited staff to view a webcast on Water Quality Crediting for Stream Restoration Projects, and the second was a Town and Gown Lunch discussion on sustainability given by Jessica Evans Fernandez of Clemson University. Each of these workshops was attended by City personnel, with opportunities for Q&A and general discussion accompanying each presentation.


Water Environment Federation
the water quality people®

Dear Daniel,

Thank you for attending our Webcast. We hope you enjoyed our event.

Professional Development Hours (PDHs) may be earned for participation in this webcast. Please use the following link to access the evaluation form to receive your PDH certificate: http://www.wefnet.org/onlinewebcast/EVForm.aspx?id=ilmkw

Please note: Webcast participants are responsible for exploring their state requirements to have their educational credits approved.

The video recording of the webcast can be found here: https://attendee.gotowebinar.com/recording/907651625034448898.

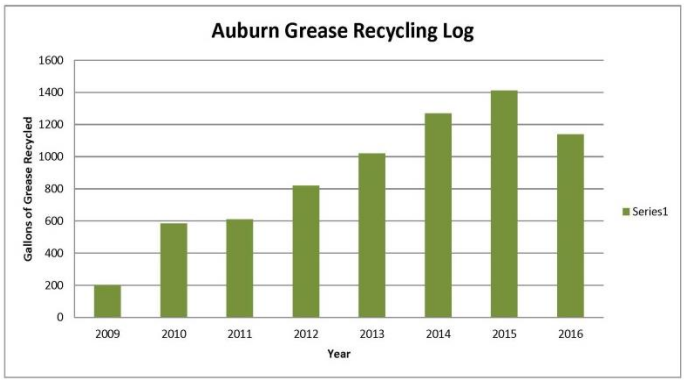
The webcast presentation handouts are available on the webcast's web page: http://www.wef.org/StreamRestorationProjects/

Please send your questions, comments and feedback to: webcasts@wef.org.

- **Webcasts & Webinars –** The Water Resource Management Department regularly schedules and participates in online webinars and webcasts training opportunities. In 2016, stormwater and watershed-related webinars/webcasts attended by City staff included topics such as stream restoration design and construction, MS4 permit Remand Rule, and monitoring and control of algal toxins in surface water reservoirs.

G. Composting and Recycling Center/Household Grease Recycling Program

The City of Auburn has been operating a curbside recycling program since 1987. In addition to curbside recycling, the City maintains a drop-off center for recyclables. The *RecycleAuburn* drop-off center is located across from the Fleet Services Complex at 365-A North Donahue Drive. These operations allow citizens of Auburn to recycle waste instead of disposing of it in the landfill. The Water Resource Management Department initiated a Household Grease Recycling Program in 2009 with containers and bins located at the recycling center. This program provides citizens with a mechanism to properly dispose of household grease and is targeted at reducing potential sanitary sewer overflows. In 2011, the Water Resource Management Department launched a curbside household grease recycling program that provides residents with an opportunity to collect their household grease and have it picked up by City personnel at their residence. **Approximately 7,753 gallons of used cooking oil/grease have been collected since implementation of the program began in March 2009, with 1,137 of those gallons collected in 2016.** For more information on our household grease recycling program, please visit:



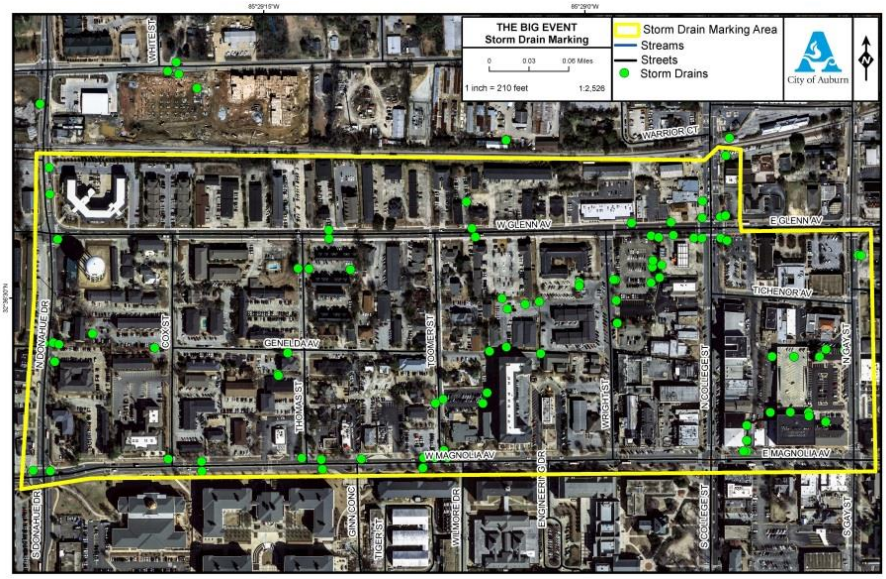
http://www.auburnalabama.org/wrm-sewer/Default.aspx?PageID=186.

In addition, the City maintains a Compost Demonstration Site that serves as an example of how homeowners can easily incorporate a home composting operation into a normal backyard setting. The site features six backyard compost units. The units range from a simple pile to a concrete bin. The exhibits take the public through the process of how to compost and recycle materials for garden use and encourage these practices. For more information on recycling of waste, please visit:

http://www.auburnalabama.org/es/.

H. Storm Drain Marking Project

In cooperation with the Auburn University Sustainability Initiative, the City initiated a storm drain marking program in 2007. School children within the City of Auburn were asked to submit designs for the original markers that were to be placed in the Saugahatchee Creek, Town Creek and Moore's Mill Creek watersheds. A number of the students' designs were selected for use. In 2010, the City of Auburn solicited new marker designs from children in the local school system. Winners were selected in April 2010 and had the opportunity to meet Mayor Ham to showcase their artwork. The local newspaper also ran an article on the project in April 2010. In 2009, the City developed a storm drain marking kit program that allows citizens to pick up a bag of materials containing all of the items needed to mark storm drains in their neighborhoods. Once the drains are marked, the citizen returns any unused materials to the Water Resource Management Department as well as a map showing the storm drains that were marked. During 2012 - 2013, the City hosted its third Storm Drain Marker Design Competition. This competition invites all 3rd – 5th grade elementary students to compete in designing the City's next storm drain markers. Winners were selected in March 2013 and each student received their award (a plaque with the storm drain marker they designed and a newspaper article published in the local paper) during a special presentation with the Mayor at City Hall. The City will continue to host these design competitions until all storm drains in the City have been marked. **In 2016, approximately 50 markers were**

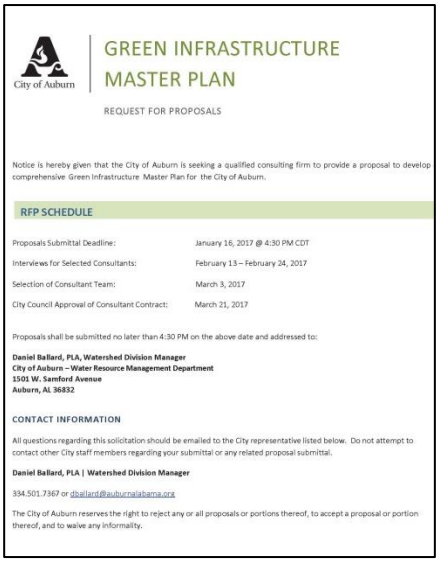


installed. Since implementation of the program began approximately **1,906** markers have been installed, representing approximately **59 percent** of all the documented storm drains in the City of Auburn.

I. Ogletree Elementary School Earth Day Field Activities

This event is an all-day natural resource education and outreach initiative organized by the teachers of Ogletree Elementary School for 3rd – 5th grade students. It is typically held at Chewacla State Park, and includes a variety of outdoor education and recreation activities. Water Resource Management staff have given presentations to the students and teachers about watershed and stormwater management, water quality and water quality monitoring, and aquatic biology. Students and their teachers are given a basic, hands-on introduction to water quality monitoring, along with information about non-point source and point source pollution prevention and reduction and tips on water conservation. **The City participated in this three-day event from May 3rd-5th of 2016.**

J. Green Infrastructure Master Plan



City of Auburn

GREEN INFRASTRUCTURE MASTER PLAN

REQUEST FOR PROPOSALS

Notice is hereby given that the City of Auburn is seeking a qualified consulting firm to provide a proposal to develop comprehensive Green Infrastructure Master Plan for the City of Auburn.

RFP SCHEDULE

Proposals Submittal Deadline:	January 16, 2017 @ 4:30 PM CDT
Interviews for Selected Consultants:	February 13 – February 24, 2017
Selection of Consultant Team:	March 3, 2017
City Council Approval of Consultant Contract:	March 21, 2017

Proposals shall be submitted no later than 4:30 PM on the above date and addressed to:

Daniel Ballard, PLA, Watershed Division Manager
City of Auburn – Water Resource Management Department
1501 W. Samford Avenue
Auburn, AL 36832

CONTACT INFORMATION

All questions regarding this solicitation should be emailed to the City representative listed below. Do not attempt to contact other City staff members regarding your submittal or any related proposal submittal.

Daniel Ballard, PLA | Watershed Division Manager

334.501.7367 or dballard@auburnalabama.org

The City of Auburn reserves the right to reject any or all proposals or portions thereof, to accept a proposal or portion thereof, and to waive any informality.

In 2016 the City began the process of planning for the future incorporation of Green Infrastructure as a "standard operating procedure". The first step in this process is to develop a strategic plan that both identifies impediments to the use of Green Infrastructure and specific opportunities for the incorporation of Green Infrastructure. A Green Infrastructure Master Plan for the City of Auburn, with the above stated purpose and objective, is being pursued for two principal reasons. These are:

1) The five major waterways of the City of Auburn are Saugahatchee Creek, Moore's Mill Creek, Parkerson Mill Creek, Town Creek, and Chewacla Creek. Of these five, three (or 60%) do not meet basic State Water Quality Criteria and are considered impaired by the Alabama Department of Environmental Management. These are Saugahatchee Creek (nutrient pollution), Parkerson Mill Creek (pathogen pollution), and Moore's Mill Creek (sediment pollution). Urban stormwater is causing or contributing to

these impairments and conventional stormwater management practices do not adequately reduce the pollutants of concern. Green Infrastructure has been proven to be both feasible and effective at mitigating the impacts of urban stormwater runoff and provides numerous co-benefits conventional practices do not.

2) Stormwater regulations, in the form of permit conditions, have been evolving toward volume-based management of stormwater runoff (aka Green Infrastructure). Water Resource Management anticipates permit conditions requiring the use of volume-based stormwater practices for new development and redevelopment in the future. Preparing for these requirements in advance of a federal and/or state mandate is advantageous, for numerous reasons, not the least of which is having the necessary experience and understanding of the planning, design, and construction of GI to maximize local value.

The City anticipates that it will select a consultant to develop this plan in 2017, and that a final plan will be completed in 2018.

K. Collaboration with Alabama Water Watch and the Auburn University Coast Guard Auxiliary Unit

In 2016 the City began working with Alabama Water Watch to identify opportunities for targeted water quality monitoring utilizing disciplined local volunteer organizations. The United States Coast Guard Auxiliary Unit Cadets at Auburn University were selected as the most capable and willing organization to perform a six-month trial program. 12 sites were selected in the Parkerson Mill Creek Watershed on or around Auburn University's Main Campus, which will be monitored monthly by six Cadets following Alabama Water Watch Protocols for bacteriological monitoring. Additionally, the Cadets will measure temperature and specific conductance at each location. The City contributed $300 for the purchase of monitoring supplies and anticipates utilizing the data to refine its identification and tracking of illicit discharges in the headwaters of Parkerson Mill Creek.

L. Comprehensive Stormwater Management Committee

In 2016 Auburn University formed an internal team to begin discussions about ways to modernize its stormwater management policy and programs and to identify areas for the development of consistency between its MS4 program and the City's. City staff have participated in these discussions since May of 2016, with meetings occurring monthly at

a minimum. To date, this group has identified several ways in which each program can more effectively, and consistently, approach stormwater management within and between our respective jurisdictional areas. One such example includes joint annual review of our respective SWMP's, thus identifying opportunities for developing program consistency and collaboration.

VII. PUBLIC INVOLVEMENT/PARTICIPATION

A. Citizens Advisory Committee

Both the EPA and ADEM recommend that the public be included in developing, implementing, and reviewing stormwater management programs through the establishment of a citizens advisory committee. Communities that encourage citizens representing diverse backgrounds and interests to participate in the development of stormwater management programs are far more likely to gain community support during the implementation process.

ALOAS CITIZENS STORMWATER ADVISORY COMMITTEE (2001-present) **- ALOAS** is a Citizens' Advisory Committee that serves **A**uburn, **L**ee County, **O**pelika, **A**uburn University and **S**miths Station. It meets on a quarterly basis to review and provide public input on current policies, brochure content, educational material, and proposed ordinances. Prior to 2012, the Citizens Advisory Group was known as ALOA. In 2012, the City of Smiths Station joined the group and the group renamed itself ALOAS to include the addition of Smiths Station. ALOAS meets quarterly throughout the year, with **four meetings held in 2016**.

In 2016, ALOAS members utilized educational materials produced and/or provided by the Clean Water Partnership, as opposed to producing its own brochures. These brochures and other materials are available to the citizens of Auburn and can be obtained at City Hall, the Bailey-Alexander Water and Sewer Complex or by contacting the Water Resource Management Department at (334) 501-3060. The brochures can also be downloaded from the City's website at http://www.auburnalabama.org/wrm-watershed/Default.aspx?PageID=211.

B. Watershed Organizations

Regional watershed organizations bring together representatives from utilities, private industry, environmental awareness groups, farmers and branches of government to coordinate individual efforts, share information and plan for water resource and aquatic life protection. The regional approach allows participating entities to expand upon individual efforts in order to maximize limited resources. These organizations also allow for the sharing of ideas, lessons-learned, and development of professional networks.

Lower Tallapoosa River Basin/Clean Water Partnership (2001-present) - The City actively participates in the Lower Tallapoosa River Basin Clean Water Partnership and on technical sub-committees to assist and guide the development and implementation of a watershed management plan. The organization meets on a quarterly basis. In 2016, as a member of the Clean Water Partnership (CWP), the City participated in quarterly meetings, gave a presentation titled "*H.C. Morgan Stream Restoration and Outdoor Classroom Project Vision*" and also hosted all four quarterly meetings of the CWP's Tallapoosa Steering Committee at the City of Auburn Bailey Alexander Water and Sewer Complex.

Save our Saugahatchee and Alabama Water Watch Citizen Water Quality Monitoring Program (2014 - Present) – Beginning in 2014, the City of Auburn, the City of Opelika, and the Lee County Highway Department have contributed $350 each to pay for material aid to the volunteer water quality monitoring programs operated by Save our Saugahatchee and the Alabama Water Watch organization. These funds are used for both physical-chemical monitoring of local waters as well as bacteriological monitoring used to guide illicit discharge detection and elimination efforts. **In 2016, the City's contribution to these organizations financed routine monitoring of 24 sites in the Saugahatchee Watershed, resulting in 145 water quality monitoring events (including water chemistry and bacteriological monitoring).** All data collected is made available to the public via the Alabama Water Watch Data Portal at:

www.alabamawaterwatch.org/water-data

Parkerson's Mill Creek Watershed Management Plan Group (March 2010 – present) - Parkerson's Mill Creek was placed on Alabama's 303(d) List of Impaired Waters for pathogens in 2007 and a pathogen TMDL for the Parkerson's Mill Creek Watershed was subsequently approved by ADEM in July 2011. Beginning in March 2010, the City has actively participated as a stakeholder in the development of the Parkerson's Mill Creek Watershed Management Plan for the past seven (7) years. This Plan was made possible through a Clean Water Act Section 319(h) grant from the United

States EPA and ADEM. The Plan's purpose is to outline a framework of BMP's for restoring water quality in Parkerson's Mill Creek by addressing impacts from non-point source pollution (stormwater runoff). The Plan was submitted to ADEM for approval in late 2010 and implementation funding was received from ADEM in 2011. The City will continue to be involved as a stakeholder in the implementation of the Parkerson's Mill Creek Watershed Management Plan. An update on Parkerson's Mill Creek Watershed Management Plan activities completed in 2016 can be found below:

- Repairs of the City of Auburn Parkerson Mill Creek Streambank and Sewer Stabilization Project in April of 2016 (+/-150 LF). Repairs included the regrading and revegetation of the lower floodbench and installation of FlexaMat articulated concrete mat to ensure protection of the sewer line. This project was partially funded by an Emergency Watershed Grant through the NRCS.
- Repairs were completed to the City of Auburn Softball Complex Streambank Stabilization Project in January of 2017, which included the installation of +/- 150 LF of a boulder toe wall, an additional boulder vane structure, and FlexaMat articulated concrete mat. This project was partially funded by an Emergency Watershed Grant through the NRCS.
- The PMC Group assisted with supporting of bacteriological monitoring in Parkerson's Mill Creek by Auburn University undergraduates students (ex. Sydney Smith), which in turn supported investigative illicit discharge detection and elimination activities for the City of Auburn and Auburn University. This included the addition of the Auburn University Coast Guard Auxiliary Unit in 2016.

  For more information on the Parkerson's Mill Creek Watershed Management Plan, please visit http://www.aces.edu/waterquality/pmc.htm.

C. City of Auburn Earth Week 2016/Household Hazardous Waste Collection Day

Earth Day is a week-long event in the City of Auburn. Over the last several years, City departments have worked to create and implement a week of environmental activities and events aimed at educating citizens of all ages of the importance of protecting our environment. In conjunction with Earth Week 2016, the City hosted its 12th Annual Household Hazardous Waste Collection Day. This annual event is a favorite among Auburn residents. Each year, the City allows its customers to drop off hazardous household chemicals at a collection site free of charge. The items are then disposed of in a safe manner, eliminating the possibility of these items being improperly dumped in local creeks and streams. **The 2016 Household Hazardous Waste Collection Day yielded approximately 18,000 pounds (9 tons) of waste collected!** Additional Earth Week 2016 activities included:

- Educational Activities for 2nd Graders including the NRCS Enviroscape model and other demonstrations
- Environmental Education Event at Chewacla State Park for Ogletree Elementary School's 3rd-5th graders, and;
- Various public library activities centered around Earth Week.

D. Website Hotline

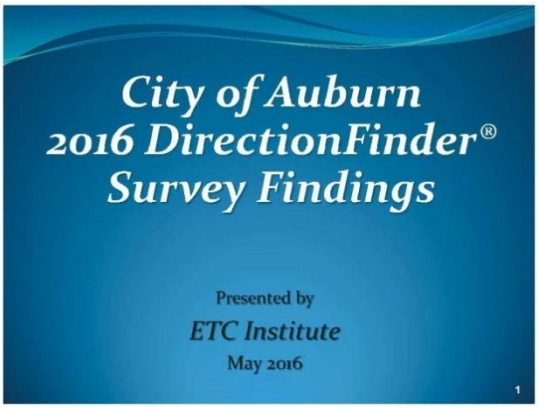
In an effort to provide the general public with an additional means of reporting potential erosion control violations, the City launched the "On-Line Hotline" in March 2003. Citizens now have the ability to log on to the website 24 hours a day and provide information on suspected violations. The information is forwarded to the Water Resource Management Department and an investigation is initiated. The website hotline has proven to be a valuable tool over the course of the past twelve years by assisting City personnel in responding to citizens' concerns. For more information concerning the hotline, please visit http://www.auburnalabama.org/wrm-watershed/.

E. Arbor Day Tree Give Away

The planting of trees improves water quality by reducing stormwater runoff and erosion while facilitating nutrient removal. In celebration of Alabama's Arbor Day and to

encourage the reforestation of the City's urban landscape, the City's Tree Commission sponsors a tree giveaway. **The Commission gave away 1,000 Dogwood seedlings and 500 Cherrybark Oak seedlings at the annual 2016 Arbor Day Tree Giveaway. The City also gave away 1,000 Dogwood seedlings at the 2016 Christmas parade. In total, the City contributed $214,000 on Urban Forestry initiatives in 2016.**

F. City of Auburn Citizen Survey



The citizen survey is an annual survey of a statistical cross section of randomly selected members of the community. The survey asks questions on issues of governmental performance and community priorities and is a means of encouraging citizens to participate in local government. In 2016, the survey contained several questions that were directly or indirectly related to stormwater issues. The questions covered issues such as infrastructure maintenance, trash collection, yard waste disposal, recycling, natural resource protection, greenspace initiatives and future growth planning. Once again in 2016, the City received very high satisfaction levels in most areas.

To view the Citizen survey, please visit: http://www.auburnalabama.org/survey.

G. Newspaper Articles

Newspaper articles covering local stormwater/environmental issues are a means for disseminating information to a large and diverse group of residents most directly impacted by these issues. Informative articles provide the reader with an independent point of view. The reader is not forced to rely on information generated by a single source (i.e. City through the newsletter Open Line or brochures).

The City is fortunate to have a local daily publication. The Opelika-Auburn News is a regional daily newspaper that covers local events and is widely read by residents of Lee County. A weekly newspaper publication, the Auburn Villager, began circulation in 2007. Articles are documented in an Access database for reference purposes. A listing of articles and publication dates is included in Appendix C of this report.

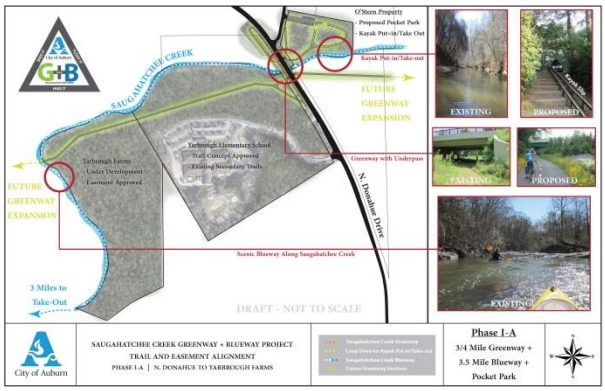
H. Greenspace Advisory Board/Greenspace Master Plan

The Auburn Greenspace Advisory Board (GAB) was created by a City Council resolution in 2002. Its objective was to identify potential areas for future property acquisitions for

parks, recreation facility projects, and greenways. Once identified, these properties could be purchased and/or protected from development.

In 2003, the GAB recommended a Greenspace/Greenway Master Plan for the City. It was adopted in December 2003 by the City Council and has been utilized by the Planning Commission in connection with approval of projects. The GAB revised the initial Plan to include a vast expansion of the proposed greenspace/greenway areas. This first amendment to the Greenspace/Greenway Master Plan was adopted by the City Council in October 2004.

This plan has resulted in the acquisition of several hundred acres of property located in environmentally sensitive areas. The greenspace/greenway areas include proposed bikeways and trails along existing and new roads and along waterways located within the City's growth boundary. Areas along waterways may be improved with natural trails and will be preserved by the dedication of conservation easements in developments or the acquisition of property by the City. The City acquired one property and two public access easements dedicated as Greenspace in 2016; +/-65 acres along Saugahatchee Creek at the end of Richland Road and +/-20 acres along Saugahatchee Creek downstream of N. Donahue. Additionally, the City continued its feasibility analysis, planning, and design work associated with a combined Blueway/Greenway along Saugahatchee Creek (general alignment as identified in Greenway Master Plan). **Survey for the first phase of the Blueway/Greenway was completed in March 2017.**



I. Auburn Interactive Growth Model

In 2007 – 2008, the City, through its Planning Department, contracted with a firm to develop the Auburn Interactive Growth Model (AIGM), a tool the City utilizes to make informed planning decisions. Detailed inventories were conducted for current development such as housing unit by type, population by age groups and retail space by gross area. A demographic forecasting model was developed as well as models for other uses that will provide guidance for future land use allocations. The AIGM also forecasts the spatial distribution of the population over time and the apportionment of land uses necessary to meet the needs of the population. The Planning Department updates the AIGM annually. Since its initial completion, the AIGM's population projections have been used in projecting water and sewer demand, future traffic, regional growth, school growth and as the foundation of the Future Land Use Plan component of CompPlan

2030. In FY 2015 the AIGM was used to project growth and demand as a part of the Downtown Master Plan. In FY 2016 the AIGM was used in conjunction with the Parks, Recreation and Culture Master Plan and is currently being used in the 5-year update to CompPlan 2030 (the city's comprehensive plan).

J. CompPlan 2030

In 2009, the City's Planning Department began development of CompPlan 2030, a comprehensive plan to guide future development in Auburn. CompPlan 2030 focuses on the following key areas: current and future land use, and how land use and the built environment affects our natural resources, schools, parks, utilities, civic facilities and transportation. The Plan provides guidance for future planning based on public input, analysis of current and future conditions, and best practices. A series of public meetings was held in 2009 and 2010 to allow citizens to share their ideas for Auburn's future, giving citizens a voice in the development of the plan. The Future Land Use Plan provides parcel-level recommendations for the type and scale of new development for the next twenty years, and is the product of a strategy to promote infill development and growth in downtown Auburn. The Future Land Use Plan element of CompPlan 2030 replaces the 2004 Future Land Use Plan. The Natural Systems and Utility sections of CompPlan 2030 provide recommendations for water conservation and stormwater management. The plan was adopted by the Auburn City Council on October 4, 2011 and City Departments are now working to integrate components of the Plan into their operations. As a part of the Planning Department's 2016 and 2017 work program, the Planning Department will spearhead the first 5-year update to CompPlan 2030. For more information on CompPlan 2030, please visit:

http://www.auburnalabama.org/Compplan2030.

K. Renew Opelika Road

Undertaken in concert with hands-on community involvement, the Downtown Master Plan reflects a balance of ideas that seek to address the needs of tomorrow while simultaneously seeking to understand the necessary steps for growth today. On this notion, the Master Plan lays out a realistic and community-based vision for the future expansion and growth of Downtown Auburn as it pertains to private development, open space and streetscapes, circulation, transportation, and economic development. The plan was adopted in July 2014 and has had immediate impact. The Zoning Ordnance changes were the first implementation steps of the plan

followed by reconstruction of Toomer's Corner with green infrastructure technologies. Further implementation of the plan continues encouraging sustainable development and capital improvement projects.

The City retained Design Workshop, Inc. to provide planning services to develop the Renew Opelika Road plan. Key to the planning process was an extensive process of public engagement. Hundreds of people participated, either in one of three public meeting opportunities or through online surveys.

The final outcome of Renew Opelika Road is a plan to guide the future development of Opelika Road and help ensure the area's future commercial vitality. The plan helps answer questions of how the community and City can support Auburn's existing businesses and attract new destinations for residents. The plan also illustrates the most effective way to improve traffic flow, pedestrian accessibility and the overall look and feel that citizens envision for the Auburn community. Several options regarding stormwater treatment along Opelika Road were included for public input during the planning process. The plan was adopted by Auburn City Council on August 20th, 2013. The first phase of implementation is complete and included changes to the zoning ordinance, changes to the future land use plan, and physical reconstruction of Opelika Road from North Gay Street to North Ross Street. The second phase was completed in 2016, which included reconstruction of the Opelika Road and East University Drive intersection. For more information on the Renew Opelika Road Plan, please visit:

http://www.auburnalabama.org/renew

L. Lee County Water Festival

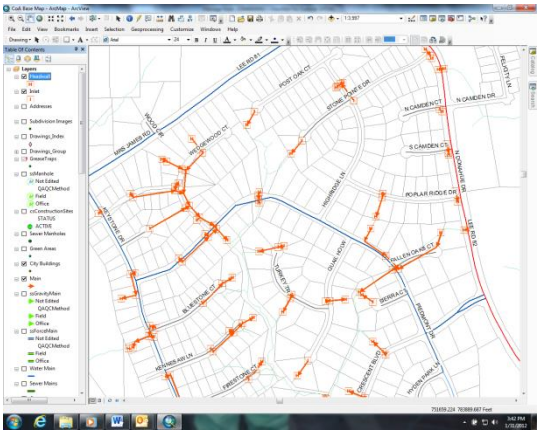
On April 4th and 5th, 2016 the twelfth annual Lee County Water Festival was held at the Beard-Eaves Memorial Coliseum of Auburn University. Over 1,200 fourth graders from schools in the Lee County area attended the two-day event. The primary purpose of the event is to educate young people on the importance of our water resources and the role each of us plays in conserving our water. During the event, students learned about water filtration, aquifers, and the water cycle through hands-on activities such as building an edible aquifer, making a water cycle bracelet, and building a mini-filtration unit. Volunteers from the City of Auburn, the Auburn Water Works Board, the City of Opelika, and other local groups helped make this past year's event a huge success. **The Auburn Water Works Board also helped to sponsor the 2016 and 2017 Water Festivals by providing a monetary donation in the amount of $3,000/year**. Planning is currently underway for the 2018 Water Festival, which is scheduled to be held at the SportsPlex of Opelika on or around May 2nd and 3rd of 2018.

M. Cedarbrook Invasive Removal and Stream Cleanup Day

The City hosted a stream cleanup and exotic invasive removal day at 348 N. Cedarbrook on March 4th, 2017. This effort was coordinated with the homeowner of 348 N. Cedarbrook and student leaders of the AU Big Event. In total, >20 students participated in cutting, clearing, and removing exotic invasive plans from the streamside of an unnamed tributary of Saugahatchee Creek. All debris was hauled to the curbside and collected by the City's Environmental Services Department for proper disposal.

VIII. ILLICIT DISCHARGE DETECTION AND ELIMINATION

A. Storm Sewer Mapping



The City of Auburn completed the initial mapping of its storm sewer system in 2003. The mapping is maintained in a Geographical Information Systems Database (GIS). Detailed information on pipe size, pipe material, direction of flow, inlets, manholes, bridges, box culverts, detention ponds, and headwalls are maintained in the City's GIS database. The City is currently working to collect stormwater infrastructure data throughout the entire City Limits. In 2013, the City began a Utility Mapping Project utilizing City survey crews and several outside surveying firms. This project is anticipated to be completed in three (3) years, and is currently entering its third and final year of the initial inventory phase. **In 2016 the City surveyed over 287,971 linear feet (54.54 Miles) of storm sewer main.** GIS files are updated on a regular basis as new work is added or as old work is modified to current standards. The latest revisions of the maps can be obtained through the Public Works Department located at 171 North Ross Street.

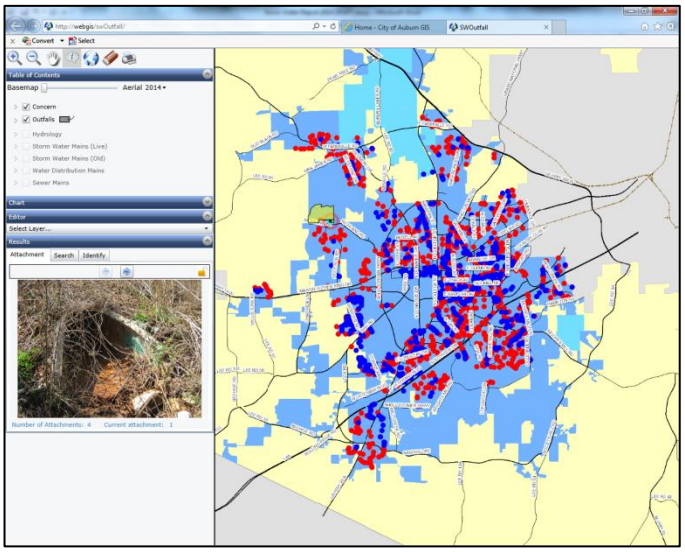
B. Illicit Discharge Ordinance

The Environmental Protection Agency (EPA) recommends municipalities implement an ordinance that provides the means to identify and enforce correction of illicit discharges. In the City's NOI, submitted to ADEM in March 2003, the stated goal was to develop and implement an Illicit Discharge Ordinance by December 2005. This goal was met two years ahead of schedule.

A draft copy of the Illicit Discharge Ordinance was reviewed by the **ALOA** (now ALOAS) Citizens Advisory Committee in November of 2003. A revised draft was forwarded to the City Attorney and Municipal Judge for review in December 2003. The Auburn City Council adopted the Illicit Discharge Ordinance on January 20, 2004.

The City of Auburn responded to several cases of reported illicit discharges in 2016. These cases involved illicit discharges of sanitary sewer overflows, private sewer liftstation overflows, washing of paint into storm drains, dumping of asphalt into stream channels, and storm/sanitary sewer cross connections. In each instance, the illicit discharge was traced back to its source and the violator was given a notice of violation and informed of the penalties for violating the City's Illicit Discharge Ordinance. In each incident, the City was able to ensure proper cleanup and corrective actions taken.

C. Stormwater Outfall Reconnaissance Inventory



In 2009, the Water Resource Management Department began a stormwater outfall reconnaissance inventory (ORI) program. The purpose of this ORI program is to familiarize staff with all receiving waters within the City limits, conduct an inspection of each stormwater outfall and prepare detailed documentation of each stormwater outfall in that basin so that water quality concerns are documented and corrective actions planned. City staff are able to document any current illicit discharges and provide more detailed location information concerning existing outfalls. The City's ORI program is patterned on recommendations outlined in the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* (Center for Watershed Protection and Dr. Robert Pitt, October 2004). The City's goal is to inspect (or screen) all of its outfalls every five years (and/or 15% per year). In calendar year 2015 Watershed Division staff began planning for the second phase of its ORI Program. This included purchasing of a LaMotte Smart 3 Colorimeter for enhanced source identification and tracking, development of plans for a small laboratory at the WRM offices, and updates to the ORI tracking application. Upon the initial completion of its inventory, the WRM Department documented and inspected approximately **two hundred forty (240) miles of stream and documented approximately one thousand two hundred twenty-eight (1,228) stormwater outfalls** in the Saugahatchee, Parkerson's Mill, Moore's Mill and Town Creek Watersheds. Staff also inspected

approximately one hundred fifty (150) sanitary sewer aerial creek crossings and identified approximately eight hundred fifty eight (858) concerns or potential concerns during the ORI program. **In 2016, staff re-screened and/or performed water quality analyses at >80 of the City's outfalls.**

The Water Resource Management Department collaborated with the City's Information Technology (IT) Department GIS Division in 2010 to develop a stormwater outfall tracking tool that allows for easy management, access and viewing of data collected during the ORI program. Staff from multiple departments can view the data assimilated by this application and can utilize that information to monitor progress at addressing concerns identified by field survey. This tool/application was updated in 2015 to include attribute fields for water quality data. A screenshot of this tool can be seen above.

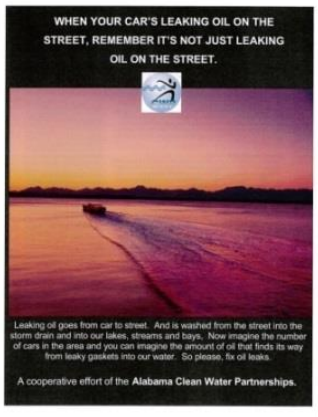
The ORI program is just one example of the measures the City has taken in creating and sustaining an efficient, effective and innovative stormwater management program, with the ultimate goal of protecting our local water resources. Staff will continue both visual screening and water quality screening of select outfalls in 2017-2018.

D. Illicit Discharge Hotline and Reporting Form


City of Auburn
Illicit Discharge Notification Form
Incident/Discharge Information
Description of Discharge

In 2008, the Water Resource Management Department developed an illicit discharge reporting form that residents can download, complete and e-mail back to the Department upon discovering a potential illicit discharge. This document is located on the Illicit Discharge Website, giving residents instant and 24-hour access to the form. This form assists the Department in tracking and responding to illicit discharges. This form can be downloaded from the City's website at http://www.auburnalabama.org/wrm-watershed/. No forms were submitted in 2016.

E. Public Education on Illicit Discharges and Improper Disposal



The Alabama Clean Water Partnership, in association with ADEM and other environmental groups, has produced a series of public service announcements featuring the "Nerdy Man". The City of Auburn has obtained materials for distribution from the Clean Water Partnership and provides them free to the public through its information centers located at City Hall, the Bailey-Alexander Water and Sewer Complex and the Development Services Building. These materials can also be obtained by contacting the Water Resource Management Department at (334) 501-3074. The City also routinely places articles in the City newsletter, Open Line, to educate citizens

on illicit discharges.

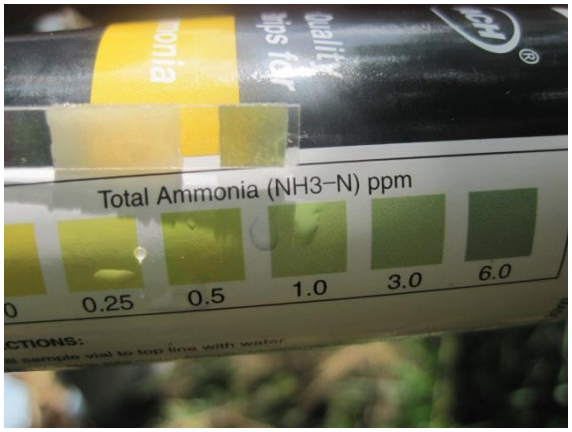
F. Inspection of Drainage System

The Public Works Department conducts routine inspections of its drainage system in order to maintain free flowing conditions. During this process, key stream sections, bridges, and culverts are inspected and routine maintenance is conducted. As areas are identified for maintenance, the work is listed on the maintenance schedule and a crew is assigned to perform the task. Water Resource Management staff are also documenting areas of concern during ORI inspections. These areas of concern are documented and placed in the stormwater outfall tracking database. **In 2016, the City's Public Works Department cleared/cleaned over 1.00 miles of storm sewer and 2,500 LF of culvert and/or drain channel of debris, sediment, and trash.**

G. Hazardous Waste Emergency Response Team

The City maintains a mutual aid agreement with the City of Opelika to share some of the cost of operating an emergency response vehicle equipped to handle hazardous waste spills. The agreement provides the City with the ability to properly identify and address hazardous or potentially hazardous spills. This agreement was renewed in 2016.

H. Water Quality Monitoring Programs



In 2004, the City of Auburn began a water quality monitoring program in an effort to analyze the effectiveness of stormwater best management practices (BMPs) on active construction sites within the City. This program has been significantly expanded over the past 13 years to include a diverse range of monitoring programs and more in-depth water quality monitoring.

In 2016, the City of Auburn continued its water quality monitoring programs in accordance with its mission and Stormwater Quality Monitoring Plan. Altogether, thousands of data points are collected by City staff and are used to make data-driven decisions for the protection, preservation, and restoration of our local water resources. **For additional information concerning the City's Water Quality Monitoring Program, please see the 2016 Annual Water Quality Monitoring Report included in Appendix**

E. This Water Quality Monitoring Report is being submitted in accordance with Part V of NPDES General Permit ALR040003.

IX. CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

A. Erosion and Sediment Control Ordinance

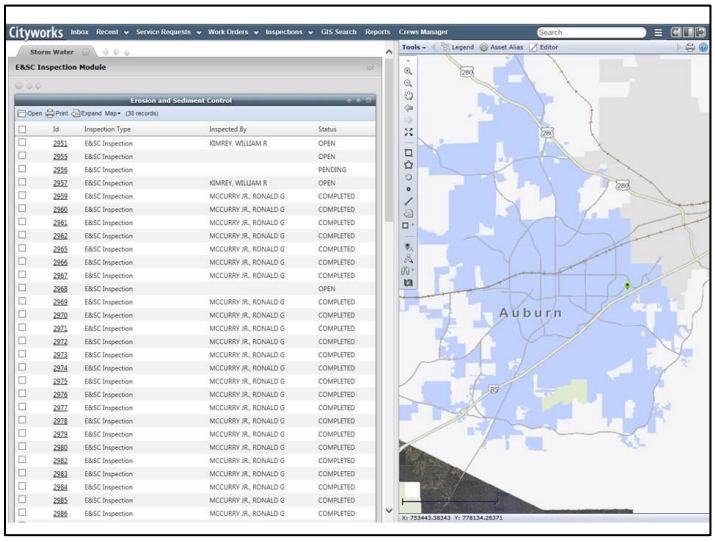
The City, in conjunction with the City of Opelika and Auburn University, adopted the Erosion and Sediment Control Policy drafted by the ALOA (now ALOAS) Citizens Advisory Committee in 2003. The policy provides for a regional set of rules that can be applied to contractors, developers and engineers in the area.

The Auburn City Council approved additions to the City's Erosion and Sediment Control Ordinance in 2005 to establish protocol for enforcement of the Ordinance and to enable City personnel to issue citations to developers/contractors in violation of the Ordinance. The enforcement mechanisms have proven to be a valuable tool in ensuring compliance with the Ordinance.

B. Erosion Control Inspections

The City, in an effort to patrol the management of erosion and sediment control measures on active construction sites, initiated a construction site inspection program in 2003. The inspection program is designed to identify deficiencies in erosion control and initiate corrective action. **Approximately 1,000 site erosion and sediment control inspections were performed in 2016 (includes follow-up inspections), resulting in 560 enforcement letters and 20 72-Hour Notices of Violation**. The number of inspections performed is relative to development activity and annual rainfall intensity and accumulation patterns. The City's Water Resource Management Department maintains copies of the inspection reports in an electronic format.

C. Erosion Control Inspection Software



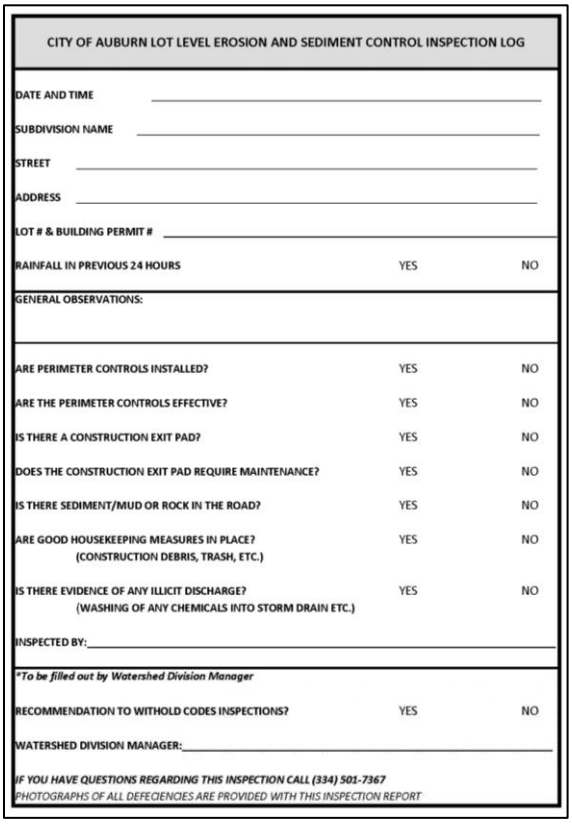
In 2011, staff from the City's Water Resource Management Department and Information Technology Department created an electronic erosion and sediment control inspection software program. This software gives staff the ability to fill out electronic copies of the erosion control inspection checklist using handheld units while in the field performing inspections. In 2015 Watershed Division staff began working with the City's IT staff to migrate the erosion and sediment control inspection and enforcement tracking into CityWorks, a GIS-centric asset management software. **Watershed Division staff began using this software exclusively in 2016.**

D. Residential Erosion Control

The City's Public Safety Department Codes Enforcement Division conducts an initial site inspection for all building construction in Auburn. Lots requesting the initial inspection must have a construction entrance and other necessary best management practices (BMPs) in place prior to authorizing foundation construction. Deficiencies noted during the initial inspection are relayed to the building permit applicant for correction.

The City's Public Safety Department Codes Enforcement Division also maintains a database of complaints received in association with erosion resulting from residential construction. The complaints are routed to enforcement officers or to Water Resource Management Department staff who investigate the complaint and pursue corrective actions with the responsible parties. Water Resource Management Department personnel also do routine checks of home construction in Auburn to ensure compliance with the City's Erosion and Sediment Control Ordinance. **The City developed and implemented a CityWorks module for tracking lot level E&SC inspections in 2016 and completed >100 lot level inspections.**

E. Added Elements to Erosion and Sediment Control



CITY OF AUBURN LOT LEVEL EROSION AND SEDIMENT CONTROL INSPECTION LOG

DATE AND TIME _____

SUBDIVISION NAME _____

STREET _____

ADDRESS _____

LOT # & BUILDING PERMIT # _____

RAINFALL IN PREVIOUS 24 HOURS	YES	NO
GENERAL OBSERVATIONS:		
ARE PERIMETER CONTROLS INSTALLED?	YES	NO
ARE THE PERIMETER CONTROLS EFFECTIVE?	YES	NO
IS THERE A CONSTRUCTION EXIT PAD?	YES	NO
DOES THE CONSTRUCTION EXIT PAD REQUIRE MAINTENANCE?	YES	NO
IS THERE SEDIMENT/MUD OR ROCK IN THE ROAD?	YES	NO
ARE GOOD HOUSEKEEPING MEASURES IN PLACE? (CONSTRUCTION DEBRIS, TRASH, ETC.)	YES	NO
IS THERE EVIDENCE OF ANY ILLICIT DISCHARGE? (WASHING OF ANY CHEMICALS INTO STORM DRAIN ETC.)	YES	NO

INSPECTED BY: _____

To be filled out by Watershed Division Manager

RECOMMENDATION TO WITHOLD CODES INSPECTIONS?	YES	NO

WATERSHED DIVISION MANAGER: _____

IF YOU HAVE QUESTIONS REGARDING THIS INSPECTION CALL (334) 501-7367
PHOTOGRAPHS OF ALL DEFECIENCIES ARE PROVIDED WITH THIS INSPECTION REPORT

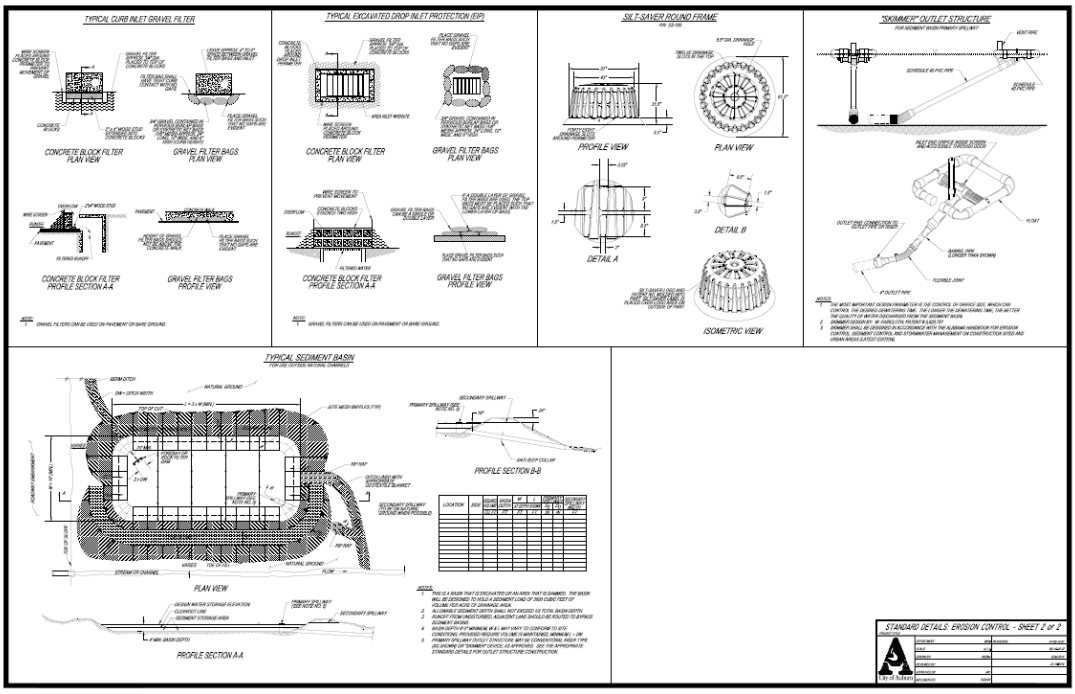
In 2015 the City began an effort to increase lot-level inspections of erosion and sediment control best management practices. Typically, the Watershed Division only conducts routine inspections of land disturbance activities equal to or greater than one acre, with routine inspections ceasing once the development is complete (roads & utilities). Increasing lot-level inspections will begin to "close the gap" between initial land clearing activities and final build-out of a project.

In conjunction with approval of the Water Resource Management Design and Construction Manual (discussed in Section X of report), the City changed the permitting process whereby erosion and sediment control BMPs are installed effective January 1, 2011. The City now issues an Erosion and Sediment Control Permit that allows for minimal clearing to install the approved BMPs onsite. This minimizes the clearing and grading work that sometimes occurred in the past prior to getting the site BMPs installed. **In 2016 the City began working to incorporate this permitting process into its CityWorks software.**

F. Erosion and Sediment Control Design

The City revised its standard erosion and sediment control details in 2010 to include a more detailed sediment basin design. The Alabama Handbook was revised in 2009 to include significant changes in design guidelines for sediment basins. The primary changes revolve around the use of baffles during construction and skimming devices for basin dewatering from the surface of the water column. The City has implemented this change in its standard details, as well as in its requirements for new developments within the City. In addition, the new construction stormwater general permit issued by ADEM in 2011 promotes the using of skimming devices by requiring mechanisms that dewater from the top of the water column in the basin.

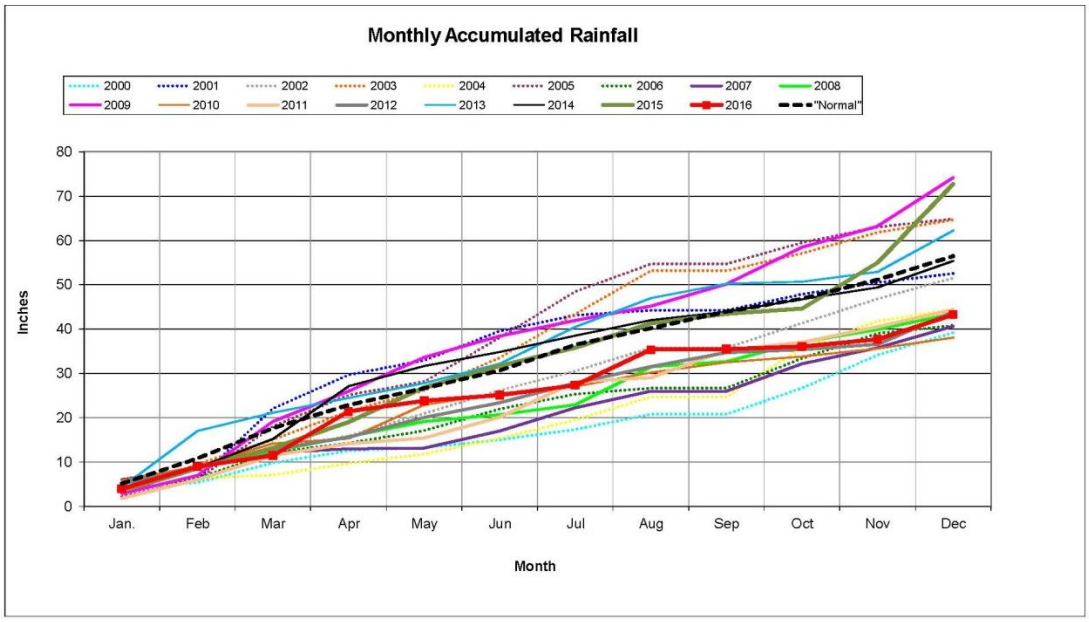
In 2013, the City also began allowing Georgia DOT Type C silt fence with a polypropylene mesh backing for reinforcement, commonly referred to as C-POP silt



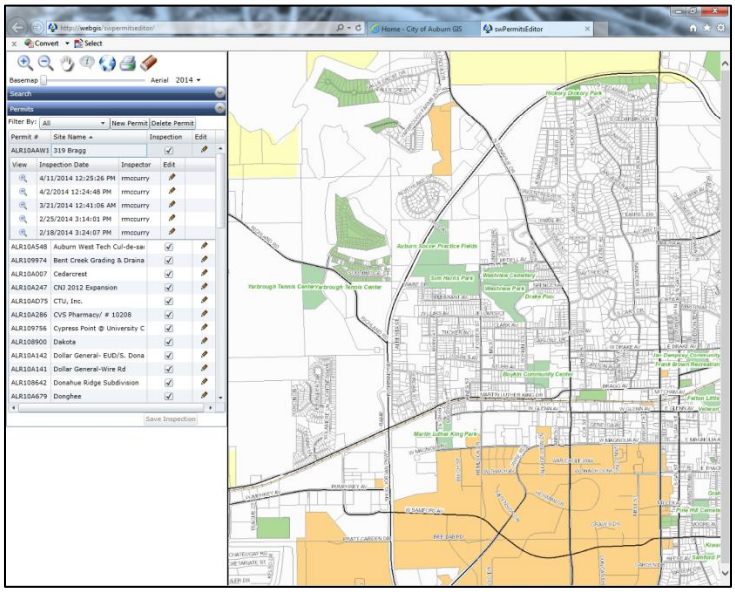
fence, as an approved alternative to Alabama DOT Type A silt fence. The C-POP silt fence is easier to install than Type A silt fence, thus helping to reduce costs, while still achieving adequate sediment capture. **In 2016, no revisions were made to the City's erosion and sediment control standard details.**

G. Rainfall Data Collection

In 2005, the City began maintaining historical rainfall data records. The data is obtained through a subscription to the Agricultural Weather Information System (AWIS) website. AWIS records daily weather data from the NOAA weather station at the Auburn University Regional Airport. The City collects the data on a routine basis and enters it into an Excel spreadsheet, enabling the City to analyze rainfall patterns and trends. The City has AWIS data dating back to 1976. The City records daily rainfall data at its two water pollution control facilities. In addition, the Auburn Water Works Board also has rain gauges located at Lake Ogletree and the James Estes Water Treatment Plant that provide daily rainfall records (intensity also available at Lake Ogletree as of 2016). Details regarding rainfall in 2016 can be found in the Water Quality Monitoring Report included in Appendix E of this report.



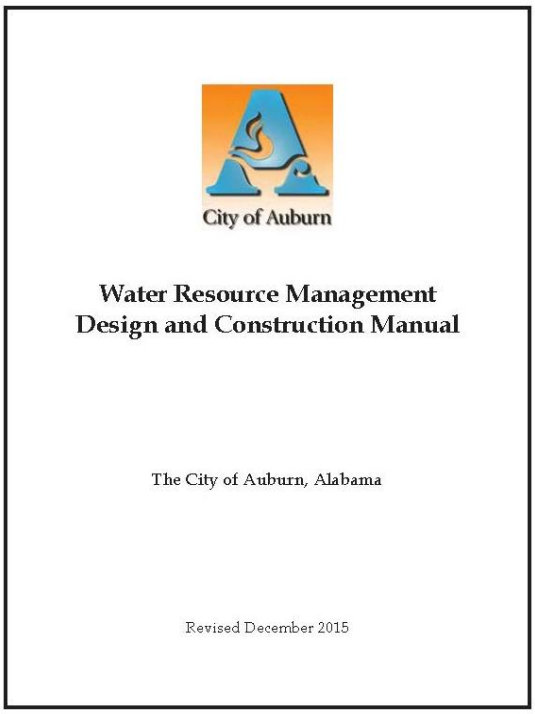
H. ADEM Construction Stormwater Permit Tracking Tool



In 2010, the Water Resource Management Department worked with assistance from the City's Information Technology Department to create a GIS-based tool that allows tracking of ADEM construction stormwater permits for developments within the City of Auburn. The tracking tool generates automatic emails that are sent to staff on a bi-weekly basis with notifications of expired permits, permits that are within thirty (30) days of expiration and permits that are within sixty (60) days of expiration. This allows staff to track permits in an efficient manner and to send notifications to permit holders who have expired permits or permits nearing expiration. In 2011, the permit tracking tool was incorporated into the Erosion and Sediment Control Software described earlier in this section. **This system was integrated with CityWorks in 2016 and staff began using it exclusively for conducting, managing, and tracking E&SC inspections and enforcement actions.**

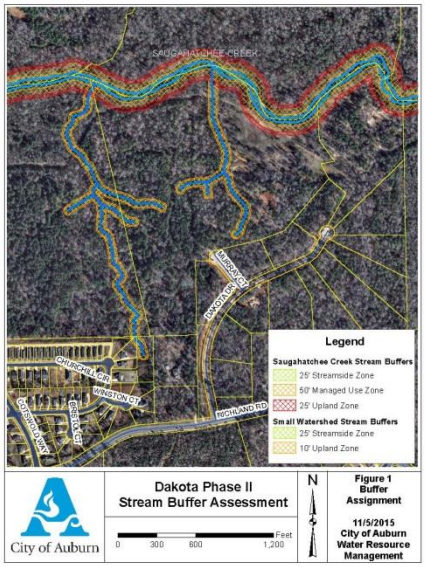
X. POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

A. Engineering Design and Construction Manuals



In April 2003, the City of Auburn published a Stormwater Design Manual that effectively addressed stormwater runoff controls required for sites greater than one acre. The manual identified project requirements and specifications for new infrastructure and also addressed the requirements for stormwater system sizing and stormwater runoff control/detention. During its implementation, the manual proved to be a very successful tool for the City and developers. The Water Resource Management Department contracted with CH2M Hill to develop an Engineering Design Manual in 2008 that includes engineering design criteria for sewer and water infrastructure, as well as stormwater BMPs for water quality protection such as rain gardens and stormwater wetlands. The Water Resource Management Design Manual also simplifies the City's regulations regarding restrictions on development in steep slope areas. The Public Works Department also developed a comprehensive Engineering Design Manual. The Stormwater Design Manual has been updated and included as an appendix in the Public Works Manual. Both the Public Works and Water Resource Management Design and Construction Manuals were adopted by the City Council in November 2010 and became effective on January 1, 2011. Revisions/amendments to the Manuals were adopted in 2011, 2013, 2014, and 2015. (*2016 revisions have been made and are pending approval by City Council). Reviews of these manuals are performed annually during the first fiscal quarter (October-December). **2016 Revisions include clarification in erosion and sediment control standards, which are anticipated to be adopted by City Council in CY 2017**.

B. Stream Buffer Regulations



As part of the Erosion and Sediment Control Ordinance adopted by the City Council in July 2002, a minimum 25-foot non-disturbed vegetative buffer zone was required for new developments on "blue line" streams and creeks identified on USGS 7.5 minute topographic maps. In May 2006, the City Council adopted new Stream Buffer regulations. The 2006 buffer regulations were based on a managed-use type buffer rather than a strict non-disturbed buffer approach. The 2006 regulations implement a 3-zoned buffer (streamside zone, managed use zone and upland zone) with the width of the buffer being based on the drainage area of the stream. A copy of the 2006 regulations can be found under Article IV in the City's Zoning Ordinance on the City's website. Greater than 656 acres of riparian corridors have been set aside since the adoption of the new regulations. **In 2016, the City reviewed 51 development plans for compliance with the stream buffer ordinance.** The table below provides the City's current stream buffer requirements.

Stream Buffer Requirements				
Drainage Area (Watershed) Designation	**Streamside Zone**	**Managed Use Zone**	**Upland Zone**	**Total Buffer Width on each side of Stream**
< 100 acres	25 feet	None	10 feet	35 feet
≥ 100 acres and ≤ 300 acres	25 feet	None	20 feet	45 feet
≥ 300 acres and ≤ 640 acres	25 feet	20 feet	10 feet	55 feet
≥ 640 acres	25 feet	50 feet	25 feet	100 feet

C. Detention Pond Inspections

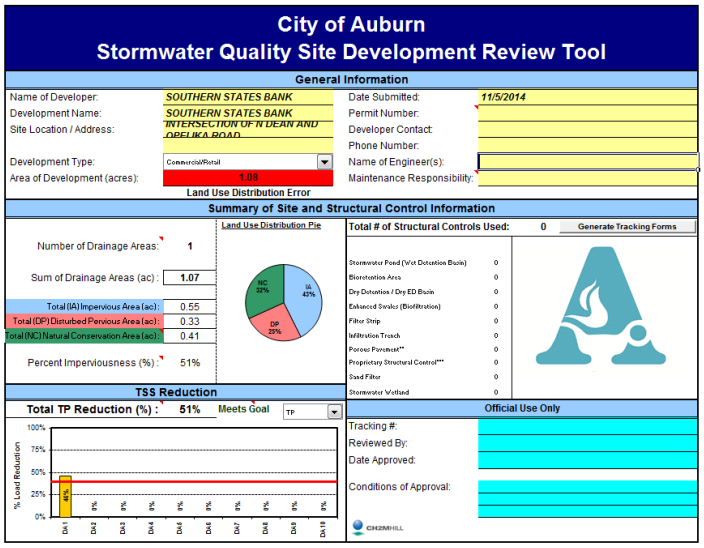
Existing detention ponds need periodic inspections to evaluate the maintenance and operation of these vital components of the City's drainage system. Because vast quantities of stormwater are collected and passed through these detention ponds every year, inspections of these facilities can identify potential problems and illicit discharges.

The Public Works Department and the Water Resource Management Department conduct annual inspections of all detention ponds (public and private) listed in the stormwater database. Upon inspection, the owner of the pond is notified of any corrective action needed. Enforcement measures are taken if the owner does not address the items listed in the report. **Approximately two hundred eighty eight (288) detention ponds were inspected by the City in 2016 (300 projected for 2017).**

D. Conservation Subdivision Regulations

In 2006, staff members from the Planning Department, Water Resource Management Department, Public Works Department and Parks and Recreation Department began developing conservation subdivision regulations to aid in the protection of local water resources. These regulations were approved by the Auburn City Council in 2007. The regulations promote water resource protection through the setting aside of open space and concentrating development away from water resources. The ordinance and subdivision regulations promote the use of low impact design concepts to protect natural resources in the Auburn area. These regulations can be downloaded from the City's website at http://www.auburnalabama.org/pl/. While developer interest for conservation subdivisions has not been strong to this point, the City continues to promote conservation subdivisions and low impact development principles for developments within the City of Auburn.

E. Site Development Review Tool



In 2006, the Water Resource Management Department contracted with CH2M Hill to develop a Site Development Review Tool (Tool) that could be utilized by local engineers when designing stormwater BMPs on developments within the City. This Tool was modeled on a similar tool created by CH2M Hill for Gwinnett County, Georgia.

The Tool was developed using a Microsoft Excel platform and can be used by engineers and developers to design and incorporate structural stormwater BMPs for developments within Auburn's planning jurisdiction boundaries and to maximize the efficiency of runoff pollutant management following construction of developments. This Tool can also be used to meet the target pollutant removal efficiencies outlined in the City's Conservation Subdivision Regulations.

The Tool provides pollutant removal estimates for site specific conditions based on removal efficiencies for a variety of stormwater BMPs including detention ponds, bioretention areas (i.e. rain gardens) and stormwater wetlands. This Tool analyzes a variety of stormwater pollutants including nutrients (phosphorus and nitrogen) and total suspended solids. City staff utilize the Tool during the plan review process to analyze development impacts on water quality within its water supply protection area (Lake Ogletree watershed). This Tool is also used by engineers when submitting water quality plans for developments located in the Saugahatchee Creek Watershed as part of its compliance with the total phosphorus TMDL for the Saugahatchee Creek watershed. A copy of the Tool can be downloaded at http://www.auburnalabama.org/wrm-watershed.

F. Student Chapter of American Society of Civil Engineers Constructed Wetland

In 2015, the student chapter of the American Society of Civil Engineers (ASCE) of Auburn University worked to design and construct an Outdoor Civil Engineering Learning Lab (Auburn OutCELL) featuring educational displays and

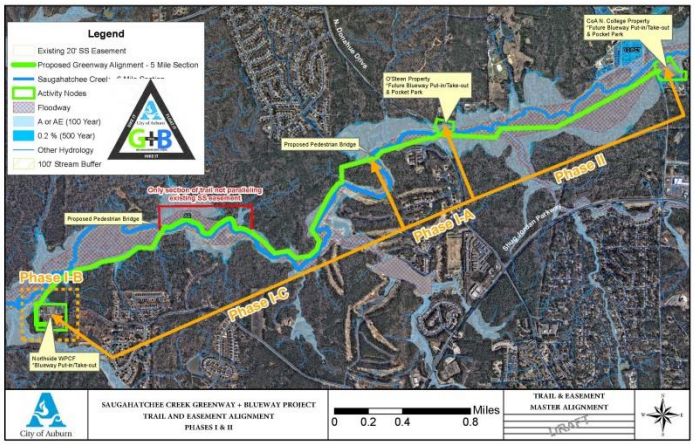
interactive exhibits meant to appeal to students of all ages. This project involved a collaborative effort with the City, which provided access to a city-owned site for developing the proposed learning center and design and construction feedback to the student-led team. The Auburn OutCELL will serve as a center where local K-12 students can come (free of charge) with family or school groups to interactively engage and learn about the various disciplines of civil engineering, specifically highlighting elements of environmental, geotechnical, hydraulics, hydrology, materials, structural, and transportation engineering.

The main feature of Auburn OutCELL is a constructed stormwater wetland, which includes an improved sediment basin and constructed treatment wetland system. Not only does this stormwater treatment system provide an ideal setup for lessons on erosion control, water quality, watershed hydrology and native Alabama vegetation, but it also serves to actively improve the quality of stormwater flowing into the Saugahatchee Creek. The site's location just off the unpaved Miracle Road leads to extremely turbid stormwater flowing through the site, which formerly deposited large amounts of sediment into the Saugahatchee Creek. **In March of 2017 the City hosted its first group of elementary school students at the OutCELL, during which the Auburn Student Chapter of the American Society of Civil Engineers introduced them to the project, its purpose, and its importance in protecting Saugahatchee Creek.**

G. Parkerson's Mill Creek Sewer and Stream Stabilization Project

The WRM Department, in coordination with Auburn University and the Alabama Cooperative Extension Service, completed construction of the Parkerson Mill Creek Sewer and Stream Stabilization Project in December of 2015. This project involved cutting into the adjacent hillside for fill material and burying the exposed sanitary sewer infrastructure (which had become exposed through lateral migration of the channel), reshaping of approximately 300 linear feet of the east streambank and bed to establish a more stable channel geometry, construction of approximately 245 linear ft. of a bankfull flood bench to reduce velocities during overbank flows and provide riparian habitat, installation of a J-hook boulder vane structure and one (1) log vane structure to direct streamflow away from the sanitary sewer infrastructure, and planting native riparian vegetation throughout the project site. **In 2016, repairs were made to this project that included the installation of +/- 150 LF of FlexaMat articulated concrete mat and additional vegetation.** For more information please contact Dusty Kimbrow at dkimbrow@auburnalabama.org or by phone at 334-501-7362.

I. Saugahatchee Greenway + Blueway Project



Saugahatchee Creek is identified as a Primary Greenway Corridor in the City's Greenway and Greenspace Master Plan. In 2015 the City began performing the necessary feasibility assessments for the development of both a greenway and blueway component of this corridor. Staff have evaluated approximately six (6) miles of Saugahatchee for floatability and over six (6) miles of existing sanitary sewer easement for trail alignment. **Between 2015 and 2017, the City has obtained more than 85 acres of land and/or public access easements thereto to convey +/-1.5 miles of Greenway and install two put-in/take-out locations. Additionally, in March of 2017 the City installed one realtime stream gage on Saugahatchee Creek, which will be used to develop a floatability index for kayaking.** For more information concerning this project, please contact Daniel Ballard at dballard@auburnalabama.org or by phone at 334-501-7367.

XI. POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

A. Stormwater Management Training

The City of Auburn continues to develop a training program that provides the Water Resource Management Department and other City departments with information on the proper methods for implementing site control measures on all municipal projects. City personnel also attend a variety of stormwater/water quality related conferences, workshops and seminars annually.

Training opportunities during this reporting year included:

- **Alabama's Water Environment Association Annual Conference (April 2016)** – This 4-day conference sponsored by Alabama's Water Environment Association, state membership association of the Water Environment Federation (WEF), focuses on stormwater, water quality, and wastewater treatment issues. Four (4) City employees (Matt Dunn, Mikel Thomspon, Dan Ballard, and Jimmy Segrest) attended the 2016 conference, attending technical sessions as well as vendor exhibits.

- **Alabama Water Resources Conference (September 2016)** – In September 2016, three (3) City employees (Daniel Ballard, Dustin Kimbrow, and Ron McCurry) attended the 2016 Alabama Water Resources Conference held in Orange Beach, AL. This annual conference focuses on a variety of water resource issues in Alabama and provides an opportunity to network with others to discuss these issues.

- **WEFTEC 2016 (September 2016)** – This 4-day conference, sponsored by the Water Environment Federation, is one of the premier water quality conferences in the world. WEFTEC 2016 was held in New Orleans, LA. Three (3) City employees (Matt Dunn, Dan Ballard, and Elisabeth Ingram) attended this conference and attended technical sessions related to watershed protection, water quality, stormwater BMPs and wastewater treatment.

- **ADEM Nonpoint Source Conference (January 2016 and January 2017)** - In January 2016 three (3) City employees (Ron McCurry, Dan Ballard, and Dustin Kimbrow) attended ADEM's 27th annual Nonpoint Source Conference in Montgomery, AL. In January 2017 one (1) City employees (Dan Ballard) attended ADEM's 28th annual Nonpoint Source Conference in Montgomery, AL (2017 was a "Cooperators Meeting" in lieu of Conference). This one (1) day conference focuses on nonpoint source stormwater issues in Alabama.

- **Qualified Credentialed Inspector Training** – On average, 12 to 14 City employees maintain Qualified Credentialed Inspector (QCI) certification. This

certification requires annual refresher training, for which all QCI certified personnel must perform in order to retain certification. In addition to QCI certified staff, the City has numerous professionals who qualify as Qualified Credentialed Professionals (QCP) through existing certifications. **In 2016, 15 employees attended the refresher course and 6 attended initial training.**

- **Alabama-Mississippi Section of the American Water Works Association Conference** – In October of 2016 three City staff (Tim Johnson, Joe Eckardt, and Eddie James) attended the Alabama-Mississippi Section of the American Water Works Association Conference.

- **ADEM Annual Surface Water Meeting and Conference** – In October 2016, three City staff (Tim Johnson, Rick McCarty, and Thomas Buchanan) attended the ADEM Annual Surface Water Meeting and Conference.

- **American Water Works Association and Alabama Water Environment Association Utility Management Workshop** – In January 2017, four City staff (Matt Dunn, Eric Carson, Elizabeth Ingram, and Tim Johnson) attended this workshop in Montgomery, AL.

- **American Water Works Association Annual Conference** – In June 2016, one City staff (Eddie James) attended this conference in Chicago, IL

B. Spill Response and Prevention Training

The City of Auburn has developed an in-house spill response training program. Staff from Water Resource Management and Public Works' Construction Management and Fleet Services Divisions routinely inspect their respective facilities for proper containment and signage associated with storage of petroleum products. Additionally, staff attend annual training on Spill Prevention, Control, and Countermeasure (SPCC) to ensure that they are prepared to respond to discharges in an appropriate manner. **In 2016, three (3) staff attended training directly related to SPCC. Additionally, Water Resource Management installed two additional enclosed areas for the storage of equipment and vehicles.**

C. Risk Management Manual

The City's Human Resources Department has developed a manual outlining specific requirements/policies for dealing with hazardous chemicals. Topic 12 (titled Hazard Communication Program) of the City's Risk Management Manual specifically requires City personnel to receive training on hazardous chemicals used. Safety Data Sheets

(SDS) identifying personal protective equipment, permissible exposure limits (PEL) and Threshold Limit Values (TLV) are required for all hazardous chemicals used. The Hazard Communication Program was adopted as part of the Risk Management Manual.

D. Municipal Operations Recycling

It has been standard policy to encourage individual Departments to participate in the City's recycling program. Recyclable waste generated through City activities is collected and processed through the City's recycling center located on Donahue Drive. **In 2016, the City recycled more than 1,270 tons of waste.**

2016 Calendar YR
RecycleAuburn Tonnage Report

Item	Total Tons
Newspaper	211.52
Green Glass	59.23
Clear Glass	108.6
Brown Glass	88.47
Alumnium Cans	39.39
Cardboard	425.83
Steel	10.65
Magazines	82.79
Mixed Paper	72.98
Plastics	124.35
Computers/Electronics	
Batteries	
Scrap Metal	39.49
Downtown Grease	16.22
Total	**1279.52**
Monthly Average	**106.63**

E. Street Sweeping

Regular street sweeping has been proven as an effective means to reduce overall pollutant loading from roads and storm sewer systems. The Environmental Services Department of the City currently performs street sweeping measures on a monthly basis throughout numerous roadways within the City. One (1) mechanical and two (2) regenerative-air/vacuum sweepers are used to perform this service. Regular street sweeping measures such as these have been shown to reduce total phosphorus loading from roadways by 1.4 to 20 percent and total suspended solids by 4 to 45 percent, with variability seen in frequency of sweeping and machine type (Breault et. al., 2003). **In 2016, the Environmental Services Department swept approximately 14,876 miles of streets and parking lots within the City, thereby removing approximately 893.7 tons of leaves and debris from the road.**

F. Alabama Certified Pesticides Applicator

The Parks and Recreation Department of the City maintains trained and certified personnel in the application of pesticides, including restricted-use pesticides. Although qualified to do so, the Parks and Recreation Department has not used any restricted-use pesticides in the previous decade. In order to maintain certification with the State of Alabama, the staff must document and complete 30 continuing education units (CEUs) over a three-year period. CEUs are earned at various conferences and workshops such as the Alabama Turfgrass Conference, Alabama Department of Transportation workshops, the Sports Turf Short Course and the Alabama Urban Forestry Association's Annual Conference. The CEUs cover the application of pesticides, information on the proper use of fertilizers and other chemicals typically used to maintain athletic fields, and best management practices for trees/shrubs/turf that are intended to reduce the need for pesticides, fertilizers and irrigation.

XII. STORMWATER INFRASTRUCTURE IMPROVEMENTS

In 2016, the Public Works Department continued to make considerable progress toward installing, rehabilitating and upgrading stormwater infrastructure within the City of Auburn. A listing of projects completed in 2016, as well as projects under construction and design, is included below.

A. Stormwater Infrastructure Projects Completed

- Renew Opelika Road Phase 1 – This project will involve the installation of 200 LF of 24-inch RCP, 400 LF of 18-inch RCP, 3 single wing inlets, 10 double wing inlets, and 5 junction boxes.

- Renew Opelika Road Phase 2 – This project will involve the installation of 21 LF of 15-inch RCP, 850 LF of 30-inch RCP, 5 single wing inlets, and 5 junction boxes.

- North College Street Streetscape Project (Phase 1 & 2) – This project will involve the installation of 20 LF of 12-inch HDPE Pipe, 24 LF of 15" pipe, 84 LF of 18-inch pipe, 4 junction boxes, 2 single wing inlets, and 2 double wing inlets.

- Opelika Road and East University Drive Intersection Improvement Project – This project will involve the installation of 307 LF of 18-inch Pipe, 131 LF of 24-inch Pipe, 11 LF 0f 30-inch Pipe, 262 LF of 36-inch pipe, 6 junction boxes, 5 single wing inlets, 3 double wing inlets, and 4 grate inlets. The project also includes removal of 770 LF of pipe, 8 inlets, and 4 junction boxes.

- South College Street and Longleaf Drive Intersection Improvement Project – This project will involve the installation of 132 LF of 18-inch Pipe, 111 LF of 24-inch pipe, 2 junction boxes, 2 single wing inlets, and 1 grate inlet. The project also includes removal of 140 LF of pipe and 2 inlets.

- West Glenn Avenue Sidewalk – The project will involve the conversion of old-style inlets to 12 standard inlets.

- Auburn Technology Park West Annex Project – This project will involve the installation of 392 LF of 18-inch Pipe, 1068 LF of 15-inch Pipe, 2 junction boxes, 12 single wing inlets, 1 double wing inlets, and a bridge.

B. Stormwater Infrastructure Projects Under Construction

- Moores Mill Road Bridge Replacement Project – This project will involve the installation of 80 LF of 12-inch Slotted Drain Pipe, 3500 LF of 18-inch Pipe, 192

LF of 24-inch pipe, 117 LF of 30-inch pipe, 304 LF of 60-inch pipe, 31 LF of 44" x 27"-inch pipe, 297 LF of 59" x 36"-inch pipe, 8 junction boxes, 32 single wing inlets, 5 double wing inlets, and 19 headwalls. The project also includes removal of 1001 LF of pipe, 7 inlets, and 19 headwalls.

- North Donahue Drive Widening Project – This project will involve the installation of 316 LF of 15-inch Pipe, 195 LF of 18-inch Pipe, 7 LF of 24-inch pipe, 1 junction boxes, 6 single wing inlets, and 2 double wing inlets. The project also includes removal of 4 inlets.

- Wire Road Widening Project – This project will involve the installation of 14 LF of 15-inch Pipe, 18 LF of 36-inch Pipe, 45 LF of 66-inch corrugated metal pipe, 3 single wing inlets, 1 double wing inlet, 1 36-incg headwall, and 1 66-inch headwall. The project also includes removal of 4 inlets.

C. Stormwater Infrastructure Projects Under Design and/or Consideration

- Hwy 14 (Martin Luther King) and Richland Road Intersection Improvements – this project will involve the installation of 26 LF of 15-inch Pipe, 280 LF of 18-inch Pipe, 1 Area inlet, 1 Junction box, and 3 single wing inlets. The project also includes removal of 1 inlet.

- East Glenn Avenue and North Ross Street Intersection Improvements – This project will involve the installation of 45 LF of 15-inch Pipe, 8 LF of 42-inch Pipe, and 1 single wing inlet. The project also includes removal of 1 inlet.

- East University Drive & Samford Avenue Sidewalk and Culvert Replacement – This project will involve the installation of 24 LF of 15-inch Pipe, removal and replacement of double barrel 6'x8' culvert, 2 double wing inlet, removal and replacement of existing headwalls.

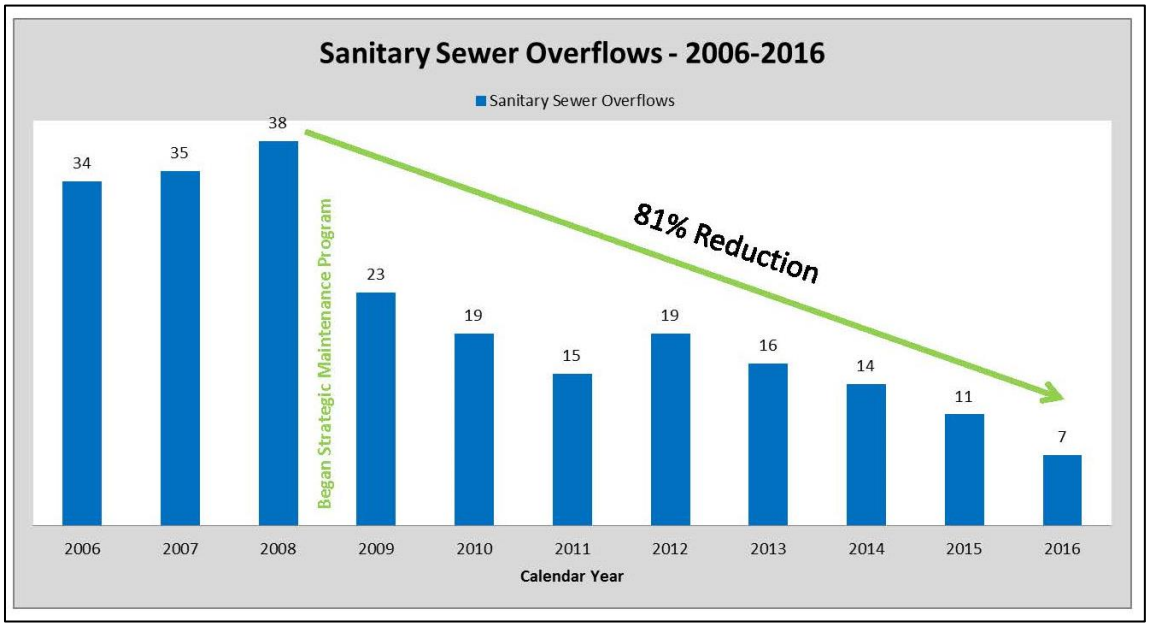
- Moores Mill Road Sidewalk - This project will involve the installation of sidewalk along the south side of Moores Mill Road from East University Drive and Samford Avenue. As part of the project, curb and gutter will be added to portions of the roadway which will trigger the need for inlets and pipe. The project also include removal of any old-style inlets.

- East Glenn Avenue Municipal Parking Lot – this project will involve the construction of a municipal surface parking lot including pervious pavers and a bioretention area.

D. Sanitary Sewer Rehabilitation Projects

Several years ago, the City began implementation of a program to identify and rehabilitate aging sanitary sewer infrastructure in the City of Auburn. The primary purpose of this program is to rehabilitate aging infrastructure, prevent sanitary sewer

overflows (SSOs) and reduce inflow and infiltration (I/I). In 2015, the City completed construction of the Southside Sewer Basin 17 sanitary sewer rehabilitation project (vicinity of Woodfield Drive, North Gay Street, South College Street) to rehabilitate aging infrastructure and address I/I. The City also began construction of the Northside Sewer Basin 5 sanitary sewer rehabilitation project (vicinity of Foster Street, Byrd Street, Bedell Avenue, Highway 14 and Shug Jordan Parkway). This project will be completed in 2015. The City plans to design and construct additional sanitary sewer improvements in 2016 to address these issues. The water quality of the City's local water resources can be improved through the City's efforts to target and reduce SSOs and excessive I/I. **Efforts to rehabilitate aging infrastructure have reduced sanitary sewer overflows by over seventy (80) percent since 2006.**



APPENDIX A

2016 PHASE II STORMWATER PERMIT

LANCE R. LEFLEUR
DIRECTOR

ROBERT J. BENTLEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

September 12, 2016

Honorable Bill Ham, Jr.
Mayor, City of Auburn
144 Tichenor Ave., Suite 1
Auburn, Alabama 36830

Re: Municipal Separate Storm Sewer System (MS4) Phase II General Permit
NPDES Permit No. ALR040003
Lee County (081)

Dear Mayor Ham:

The Department has made a final determination to reissue General NPDES Permit No. ALR040000 for discharges from regulated small municipal separate storm sewer systems. The reissued permit will become effective on October 1, 2016 and will expire on September 30, 2021.

The Department notified the public of its tentative determination to reissue General NPDES Permit No. ALR040000 on November 18, 2015. Interested persons were provided the opportunity to submit comments on the Department's tentative decision through December 18, 2015. In accordance with ADEM Admin Code r. 335-6-6-.21(7), a response to all comments received during the public comment period will be available on the Department's efile system.

Based on your request, as evidenced by the submittal of a Notice of Intent, coverage under the General NPDES Permit No. ALR040003 is granted. The effective date of issuance coverage is October 1, 2016.

Coverage under this permit does not authorize the discharge of pollutant or non-stormwater that is not specifically identified in the permit and by the Notice of Intent which resulted in granting this coverage.

You are responsible for compliance with all provisions of the permit, including, but not limited to, the performance of any monitoring (if applicable), the submittal of any reports, and the preparation and implementation of any plans required by the permit. Part II.A.4. of the re-issued permit requires the submittal of an updated Stormwater Management Program Plan (SWMPP) within three months of the issuance date of this permit (January 1, 2017).

If you have any additional questions or concerns, please contact Marla Smith by email at mssmith@adem.state.al.us or by phone at 334-270-5616.

Sincerely,

Jeffery W. Kitchens, Chief
Stormwater Management Branch
Water Division

JWK/mss

File: FPER/1207

Enclosure: Final Permit ALR040003

Cc: Ms. Kacy Sable, EPA (via email)
Mr. Dan Ballard, City of Auburn (via email)

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

ADEM
Alabama Department of Environmental Management

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

DISCHARGE AUTHORIZED:	STORMWATER DISCHARGES FROM REGULATED SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
AREA OF COVERAGE:	THE STATE OF ALABAMA
PERMIT NUMBER:	ALR040003
RECEIVING WATERS:	ALL WATERS OF THE STATE OF ALABAMA

In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C.§§1251-1378 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.

ISSUANCE DATE:	SEPTEMBER 6, 2016
EFFECTIVE DATE:	OCTOBER 1, 2016
EXPIRATION DATE:	SEPTEMBER 30, 2021

GIENNA L. DEAN
Alabama Department of Environmental Management

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PART I Coverage Under This General Permit

A. Permit Coverage

This permit covers the urbanized areas designated as a Phase II Municipal Separate Storm Sewer System (MS4) within the State of Alabama.

B. Authorized Discharges

1. This permit authorizes discharges of storm water from small MS4s, as defined in 40 CFR Part 122.26(b)(16). An entity may discharge under the terms and conditions of this general permit if the entity:
    a. Owns or operates a small MS4 within the permit area described in Section A;
    b. Is not a "large" or "medium" MS4 as described in 40 CFR Part 122.26(b)(4) or (7);
    c. Submits a Notice of Intent (NOI) in accordance with Part II of this general permit; and
    d. Either:
        i. Is located fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census, or
        ii. Is designated for permit authorization by the Department pursuant to 40 CFR Part 122.32(a)(2).
2. This permit authorizes the following non-storm water discharges provided that they do not cause or contribute to a violation of water quality standards and that they have been determined not to be substantial contributors of pollutants to a particular small MS4 applying for coverage under this permit and that is implementing the storm water management program (SWMP) set forth in this permit:

    a. Water line flushing
    b. Landscape irrigation
    c. Diverted stream flows
    d. Uncontaminated ground water infiltration
    e. Uncontaminated pumped groundwater
    f. Discharges from potable water sources
    g. Foundation drains
    h. Air conditioning condensate
    i. Irrigation water (not consisting of treated, or untreated, wastewater)
    j. Rising ground water
    k. Springs
    l. Water from crawl space pumps
    m. Footing drains
    n. Lawn watering runoff
    o. Individual residential car washing, to include charitable carwashes

p. Residual street wash water
q. Discharge or flows from firefighting activities (including fire hydrant flushing)
r. Flows from riparian habitats and wetlands
s. Dechlorinated swimming pool discharges, and
t. Discharges authorized and in compliance with a separate NPDES permit.

C. Prohibited Discharges

The following discharges are not authorized by this permit:

1. Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are:
   a. In compliance with a separate NPDES permit; or
   b. Determined by the Department not to be a significant contributor of pollutants to waters of the State;
2. Storm water discharges associated with industrial activity as defined in 40 CFR Part 122.26(b)(14)(i)-(ix) and (xi);
3. Storm water discharges associated with construction activity as defined in 40 CFR Part 122.26(b)(14)(x) or 40 CFR 122.26(b)(15) and subject to Alabama Department of Environmental Management (ADEM) Code r. 335-6-12;
4. Storm water discharges currently covered under another NPDES permit;
5. Discharges to territorial seas, contiguous zone, and the oceans unless such discharges are in compliance with the ocean discharge criteria of 40 CFR Part 125, Subpart M;
6. Discharges that would cause or contribute to instream exceedances of water quality standards; Your storm water management program plan (SWMPP) must include a description of the Best Management Practices (BMPs) that you will be using to ensure that this will not occur. The Department may require corrective action or an application for an individual permit if an MS4 is determined to cause an instream exceedance of water quality standards;
7. Discharges of any pollutant into any water for which a total maximum daily load (TMDL) has been approved or developed by EPA unless your discharge is consistent with the TMDL; This eligibility condition applies at the time you submit a NOI for coverage. If conditions change after you have permit coverage, you may remain covered by the permit provided you comply with the applicable requirements of Part V. You must incorporate any limitations, conditions and requirements applicable to your discharges, including monitoring frequency and reporting required, into your SWMPP in order to be eligible for permit coverage. For discharges not eligible for coverage under this permit, you must apply for and receive an individual or other applicable general NPDES permit prior to discharging;
8. This permit does not relieve entities that cause illicit discharges, including spills, of oils or hazardous substances, from responsibilities and liabilities under State and Federal law and regulations pertaining to those discharges.

D. Obtaining Authorization

1. To be authorized to discharge storm water from small MS4s, you must submit a Notice of Intent (NOI) and a description of your storm water management program (SWMP) in accordance with the deadlines presented in Part II of this permit.
2. You must submit the information required in Part II on the latest version of the NOI form (or photocopy thereof). Your NOI must be signed and dated in accordance with Part VII of this permit.
3. No discharge under the general permit may commence until the discharger receives the Department's acknowledgement of the NOI and approval of the coverage of the discharge by the general permit. The Department may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI.
4. Where the operator changes, or where a new operator is added after submittal of an NOI under Part II, a new NOI must be submitted in accordance with Part II within thirty (30) days of the change or addition.
5. For areas extended within your MS4 by the latest census or annexed into your MS4 area after you received coverage under this general permit, the first annual report submitted after the annexation must include the updates to your SWMP, as appropriate.

Note: If the Department notifies the dischargers (directly, by the public notice, or by making information available on the Internet) of other NOI form options that become available at a later date (e.g., electronic submission of forms), you may take advantage of those options to satisfy the NOI use and submittal requirements in Part II.

E. Implementation

1. This permit requires implementation of the MS4 Program under the State and Federal NPDES Regulations. MS4s shall modify their programs if and when water quality considerations warrant greater attention or prescriptiveness in specific components of the municipal program.
2. If a small MS4 operator implements the minimum control measures in 40 CFR 122.34(b) and the discharges are determined to cause or contribute to non-attainment of an applicable water quality standard as evidenced by the State of Alabama's 303(d) list or an EPA-approved or developed Total Maximum Daily Load (TMDL), the operator must tailor its BMPs within the scope of the six minimum control measures to address the pollutants of concern and implement permit requirements outlined in Part IV.D. and Part V of this permit.
3. Existing MS4s, unless otherwise stated within this permit, shall implement each of the minimum control measures outlined in Part III.B. of this permit immediately upon the effective date of coverage. Newly designated MS4s, unless otherwise stated in this permit, shall implement the minimum control measures outlined in Part III.B. of this permit within

365 days of the effective date of coverage. However, for newly designated MS4s, where new or revised ordinances are required to implement any of the minimum control measures, such ordinances shall be enacted within 730 days from the effective date of coverage.

PART II Notice of Intent (NOI) Requirements

A. Deadlines of Applications

1. If you are automatically designated under 40 CFR Part 122.32(a)(1) or designated by the Department, then to request recoverage, you are required to submit an NOI or an application for an individual permit and a description of your SWMP at least 90 days before the expiration of this permit.
2. If you are designated by the Department after the date of permit issuance, then you are required to submit an NOI or an application for an individual permit and a description of your SWMP within 180 days upon notification. Within six months of initial issuance, the operator of the regulated small MS4 shall submit a storm water management program plan (SWMPP) to the Department for review. A SWMPP can be submitted electronically in a .PDF format, or in another prescribed manner acceptable to the Department that contains all necessary components
3. You are not prohibited from submitting an NOI after the dates provided in Part II.A.1-2. If a NOI is submitted after the dates provided in Part II.A.1-2., your authorization is only for discharges that occur after permit coverage is granted. The Department reserves the right to take appropriate enforcement actions for any unpermitted discharges.
4. Within three months of the date of re-issuance of coverage under this permit, all operators of regulated small MS4s shall submit a revised storm water management program plan (SWMPP) to the Department for review.
5. **On or after December 21, 2020, all NOIs shall be made electronically in a prescribed manner acceptable to the Department.**

B. Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the ADEM Code r. 335-6-6 and remain in force and effect if the Permittee re-applies for coverage as required under Part II of this Permit. Any Permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:

1. Reissuance or replacement of this permit, at which time you must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
2. Issuance of an individual permit for your discharges; or
3. A formal permit decision by the Department not to reissue this general permit, at which time you must seek coverage under an alternative general permit or an individual permit.

C. Contents of the Notice of Intent (NOI)

The Notice of Intent must be signed in accordance with Part VII.G of this permit and must include the following information:

1. Information on the Permittee:
    a. The name of the regulated entity, specifying the contact person and responsible official, mailing address, telephone number and email address; and
    b. An indication of whether you are a Federal, State, County, Municipal or other public entity.

2. Information on the MS4:
    a. the name of your organization, county, city, or town and the latitude/longitude of the center or the MS4 location;
    b. The name of the major receiving water(s) and an indication of whether any of your receiving waters are included on the latest 303(d) list, included in an EPA-approved and/or EPA developed total maximum daily load (TMDL) or otherwise designated by the Department as being impaired. If you have discharges to 303(d) or TMDL waters, a certification that your SWMPP complies with the requirements of Part V;
    c. If you are relying on another governmental entity, regulated under the storm water regulations (40 CFR Part 122.26 & 122.32) to satisfy one or more of your permit obligations (see Part III), the identity of that entity(ies) and the elements(s) they will be implementing. The Permittee remains responsible for compliance if the other entity fails to fully perform the permit obligation, and may be subject to enforcement action if neither the Permittee nor the other entity fully performs the permit obligation; and
    d. Must include if you are relying on the Department for enforcement of erosion and sediment controls on qualifying construction sites in accordance with Part III.B.3.b.

3. Include a brief summary of the best management practices (BMPs) for the minimum control measures in Part III of this permit (i.e. a brief summary of the MS4's SWMPP), your timeframe for implementing each of the BMPs, and the person or persons responsible for implementing or coordinating your SWMPP.

D. Where to Submit MS4 Documents

You are to submit your NOI or individual application, and a description of your SWMP as allowed under Part II.A., signed in accordance with the signatory requirements of Section VII of this permit, to the Department at the following address:

Alabama Department of Environmental Management
Water Division
Storm Water Management Branch
Post Office Box 301463
Montgomery, Alabama 36130-1463

Certified and Registered Mail shall be addressed to:

Alabama Department of Environmental Management
Water Division
Storm Water Management Branch
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059

On or after December 21, 2020, all NOIs shall be made electronically in a prescribed manner acceptable to the Department.

PART III Storm Water Pollution Prevention and Management Program for Small MS4s

A. Storm Water Management Program (SWMP)

1. The Permittee is required to develop, revise, implement, maintain and enforce a storm water management program (SWMP) which shall include controls necessary to reduce the discharge of pollutants from its MS4 consistent with Section 402(p)(3)(B) of the Clean Water Act and 40 CFR Parts 122.30-122.37. These requirements shall be met by the development and implementation of a storm water management program plan (SWMPP) which addresses the best management practices (BMPs), control techniques and systems, design and engineering methods, public participation and education, monitoring, and other appropriate provisions designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP).
2. The Permittee shall provide and maintain adequate finance, staff, equipment, and support capabilities necessary to implement the SWMPP and comply with the requirements of this permit.
3. The SWMPP must address the minimum storm water control measures referenced in Part III.B. to include the following:
    a. A map of the Permittee's MS4 urbanized areas;
    b. The BMPs that will be implemented for each control measure. Low impact development/green infrastructure shall be considered where feasible. Information on LID/Green Infrastructure is available on the following websites: http://www.adem.alabama.gov/programs/water/waterforms/LIDHandbook.pdf and http://epa.gov/polwaste/green/index.cfm.
    c. The measureable goals for each of the minimum controls outlined in Part III.B.;
    d. The proposed schedule—including interim milestones, as appropriate, inspections, and the frequency of actions needed to fully implement each minimum control; and
    e. The person and/or persons responsible for implementing or coordination the BMPs for each separate minimum control measure.

4. Once the initial SWMPP is acknowledged by ADEM, activities and associated schedules outlined by the SWMPP or updates to the SWMPP are conditions of the permit.
5. Unless otherwise specified in this permit, the Permittee shall be in compliance with the conditions of this permit by the effective date of coverage.

B. Minimum Storm Water Control Measures

1. Public Education and Public Involvement on Storm Water Impacts

a. The Permittee must develop and implement a public education and outreach program to inform the community about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff to the MEP. The Permittee shall continuously implement this program in the areas served by the MS4. The Permittee shall also comply, at a minimum, with applicable State and local public notice requirements when implementing a public involvement/participation program.

b. The Permittee shall include within the SWMPP the methods for how it will:
   i. Seek and consider public input in the development, revision, and implementation of the SWMPP;
   ii. Identify targeted pollutant sources the Permittee's public education program is intended to address;
   iii. Specifically address the reduction of litter, floatables and debris from entering the MS4, that may include, but is not limited to:
      1. Establishing a program to support volunteer groups for labeling storm drain inlets and catch basins with "no dumping" message; and
      2. Posting signs referencing local codes that prohibit littering and illegal dumping at selected designated public access points to open channels, creeks, and other relevant waterbodies;
   iv. Inform and involve individuals and households about the steps they can take to reduce storm water pollution; and
   v. Inform and involve individuals and groups on how to participate in the storm water program (with activities that may include, but not limited to, local stream and lake restoration activities, storm water stenciling, advisory councils, watershed associations, committees, participation on rate structures, stewardship programs and environmental related activities). The target audiences and subject areas for the education program that are likely to have significant storm water impacts should include, but is not limited to, the following:
      1. General Public
         a. General impacts litter has on water bodies, how trash is delivered to streams via the MS4 and ways to reduce the litter;

b. General impacts of storm water flows into surface water from impervious surface; and
c. Source control BMPs in areas of pet waste, vehicle maintenance, landscaping and rain water reuse.

2. General Public, Businesses, Including Home-Based and Mobile Businesses
   a. BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials; and
   b. Impacts of illicit discharges and how to report them.

3. Homeowners, Landscapers, and Property Managers
   a. Yard care techniques that protect water quality;
   b. BMPs for use and storage of pesticides and fertilizers;
   c. BMPs for carpet cleaning and auto repair and maintenance;
   d. Runoff reduction techniques, which may include but not limited to site design, pervious paving, retention of forests, and mature trees; and
   e. Storm water pond maintenance.
4. Engineers, Contractors, Developers, Review Staff and Land Use Planners
   a. Technical standards for construction site sediment and erosion control;
   b. Storm water treatment and flow control BMPs;
   c. Impacts of increased storm water flows into receiving water bodies; and
   d. Run-off reduction techniques and low impact development (LID)/green infrastructure (GI) practices that may include, but not limited to, site design, pervious pavement, alternative parking lot design, retention of forests and mature trees to assist in storm water treatment and flow control BMPS.

vi. Evaluation of the effectiveness of the public education and public involvement program.

c. The Permittee shall report each year in the annual report the following information:
   i. A description of the activities used to involve groups and/or individuals in the development and implementation of the SWMPP;
   ii. A description of the individuals and groups targeted and how many groups and/or individuals participated in the programs;
   iii. A description of the activities used to address the reduction of litter, floatables and debris from entering the MS4 as required in Part III.B.1.b.iii.;

iv. A description of the communication mechanisms or advertisements used to inform the public and the quantity that were distributed (i.e. number of printed brochures, copies of newspapers, workshops, public service announcements, etc); and

v. Results of the evaluation of the public education and public involvement program as required in Part III.B.1.b.vi.

d. The Permittee shall make their SWMPP and their annual reports required under this permit available to the public when requested. The current SWMPP and the latest annual report should be posted on the Permittee's website, if available.

2. Illicit Discharge Detection and Elimination (IDDE) Program

a. The Permittee shall implement an ongoing program to detect and eliminate illicit discharges into the MS4, to the maximum extent practicable. The program shall include, at a minimum, the following:

i. An initial map shall be provided in the SWMPP with updates, if any, provided each year in the annual report. The map shall include, at a minimum:

1. The latitude/longitude of all known outfalls;
2. The names of all waters of the State that receive discharges from these outfalls; and,
3. Structural BMPs owned, operated, or maintained by the Permittee.

ii. To the extent allowable under State law, an ordinance or other regulatory mechanism that effectively prohibits non-storm water discharges to the MS4. The ordinance or other regulatory mechanism shall be reviewed annually and updated as necessary and shall:

1. Include escalating enforcement procedures and actions; and
2. Require the removal of illicit discharges and the immediate cessation of improper disposal practices upon identification of responsible parties. Where the removal of illicit discharge within ten (10) working days is not possible, the ordinance shall require an expeditious schedule for removal of the discharge. In the interim, the ordinance shall require the operator of the illicit discharge to take all reasonable and prudent measures to minimize the discharge of pollutants to the MS4.

iii. A dry weather screening program designed to detect and address non-storm water discharges to the MS4. This program must address, at a minimum, dry weather screening of fifteen percent (15%) of the outfalls once per year with all (100 percent) screened at least once per five years. Priority areas, as described by the Permittee in the SWMPP, will be dry weather screened on a more frequent schedule as outlined in the SWMPP. If any indication of a suspected illicit discharge, from an unidentified

source, is observed during the dry weather screening, then the Permittee shall follow the screening protocol as outlined in the SWMPP.

iv. Procedures for tracing the source of a suspect illicit discharge as outlined in the SWMPP. At a minimum, these procedures will be followed to investigate portions of the MS4 that, based on the results of the field screening or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water.

v. Procedures for eliminating an illicit discharge as outlined in the SWMPP;

vi. Procedures to notify ADEM of a suspect illicit discharge entering the Permittee's MS4 from an adjacent MS4 as outlined in the SWMPP;

vii. A mechanism for the public to report illicit discharges discovered within the Permittee's MS4 and procedures for appropriate investigation of such reports;

viii. A training program for appropriate personnel on identification, reporting, and corrective action of illicit discharges;

ix. Address the following categories of non-storm discharges or flows (i.e., illicit discharges) only if the Permittee or the Department identifies them as significant contributors of pollutants to your small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (infiltration is defined as water other than wastewater that enters a sewer system, including foundation drains, from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering run-off, individual residential car washing, flows from riparian habitats and wetlands, discharge or flows from firefighting activities (to include fire hydrant flushing); dechlorinated swimming pool discharges, and residual street wash water, discharge authorized by and in compliance with a separate NPDES permit; and

x. The Permittee may also develop a list of other similar occasional incidental non- storm water discharges (e.g. non-commercial or charity car washes, etc.) that will not be addressed as illicit discharges. These non- storm water discharges must not be reasonably expected (based on information available to the Permittees) to be significant sources of pollutants to the municipal separate storm sewer system, because of either the nature of the discharges or conditions you have established for allowing these discharges to your MS4 (e.g., a charity car wash with appropriate controls on frequency, proximity to impaired waterbodies, BMPs on the wash water, etc.). You must document in your SWMPP any local controls or conditions placed on the discharges. The Permittee must include a provision prohibiting any individual non- storm water discharge that is

determined to be contributing significant amounts of pollutants to your MS4.

b. The Permittee shall report each year in the annual report the following information:
   i. List of outfalls observed during the dry weather screening;
   ii. Updated MS4 map(s) unless there are no changes to the map that was previously submitted. When there are no changes to the map, the annual report must state this;
   iii. Copies of, or a link to, the IDDE ordinance or other regulatory mechanism; and
   iv. The number of illicit discharges investigated, the screening results, and the summary of corrective actions taken to include dates and timeframe of response.

3. Construction Site Storm Water Runoff Control

a. The Permittee must develop/revise, implement and enforce an ongoing program to reduce, to the maximum extent practicable, the pollutants in any storm water runoff to the MS4 from qualifying construction sites. The program shall include the following at a minimum:
   i. Specific procedures for construction site plan (including erosion prevention and sediment controls) review and approval: The MS4 procedures must include an evaluation of plan completeness and overall BMP effectiveness;
   ii. To the extent allowable under State law, an ordinance or other regulatory mechanism to require erosion and sediment controls, sanctions to ensure compliance, and to provide all other authorities needed to implement the requirements of Part III.B.3 of this permit;
   iii. A training program for MS4 site inspection staff in the identification of appropriate construction best management practices (example: QCI training in accordance with ADEM Admin Code. R. 335-6-12 or the Alabama Construction Site General Permit);
   iv. Procedures for the periodic inspection of qualifying construction sites to verify the use of appropriate erosion and sediment control practices that are consistent with the Alabama Handbook for Erosion Control, Sediment Control, And Stormwater Management on Construction Sites and Urban Areas published by the Alabama Soil and Water Conservation Committee (hereinafter the "Alabama Handbook"). The frequency and prioritization of inspection activities shall be documented in the SWMPP and must include a minimum inspection frequency of once each month for priority construction sites;
   v. Procedures, as outlined in the SWMPP, to notify ADEM of construction sites that do not have a NPDES permit or ineffective BMPs that are discovered during the periodic inspections. The notification must provide,

at a minimum, the specific location of the construction project, the name and contact information from the owner or operator, and a summary of the site deficiencies; and

vi. A mechanism for the public to report complaints regarding discharges from qualifying construction sites.

b. ADEM implements a State-wide NPDES construction storm water regulatory program. As provided by 40 CFR Part 122.35(b), the Permittee may rely on ADEM for the setting of standards for appropriate erosion controls and sediment controls for qualifying construction sites and for enforcement of such controls, and must document this in its SWMPP. If the Permittee elects not to rely on ADEM's program, then the Permittee must include the following, at a minimum, in its SWMPP:

i. Requirements for construction site operators to implement appropriate erosion and sediment control BMPs consistent with the Alabama Handbook for Erosion Control, Sediment Control, And Stormwater Management on Construction Sites and Urban Areas published by the Alabama Soil and Water Conservation Committee (hereinafter the "Alabama Handbook");

ii. Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

iii. Development and implementation of an enforcement strategy that includes escalating enforcement remedies to respond to issues of non-compliance;

iv. An enforcement tracking system designed to record instances of non-compliance and the MS4's responding actions. The enforcement case documentation should include:

1. Name of owner/operator
2. Location of construction project or industrial facility
3. Description of violations
4. Required schedule for returning to compliance
5. Description of enforcement response used, including escalated responses if repeat violation occur or violations are not resolved in a timely manner;
6. Accompanying documentation of enforcement response (e.g., notices of noncompliance, notices of violation, etc);
7. Any referrals to different departments or agencies; and
8. Date violation was resolved

v. The Permittee must keep records of all inspections (i.e. inspection reports) and employee training required by Part III.3.a.

c. The Permittee shall include within the SWMPP the following information:

i. Procedures for site plan reviews as required by Part III.B.3.a.i;

ii. A copy or link of the ordinance or other regulatory mechanism required by Part III.B.3.a.ii.;

iii. Plans for the training of MS4 site inspection staff as required by Part III.B.3.a.iii; and

iv. A site inspection plan meeting the requirements of Part III.B.3.a.iv; and

d. The Permittee shall maintain the following information and make it available upon request:

i. Documentation of all inspections conducted of qualifying construction sites as required by Part III.B.3.a.iv. The inspection documentation shall include, at a minimum, the following:

1. Facility type;
2. Inspection date;
3. Name and signature of inspector;
4. Location of construction project;
5. Owner/operator information (name, address, phone number, email);
6. Description of the storm water BMP condition that may include, but not limited to, the quality of vegetation and soils, inlet and outlet channels and structures, embankments, slopes and safety benches, spillways, weirs, and other control structures; and sediment and debris accumulation in storage and forebay areas as well as in and around inlet and outlet structures; and
7. Photographic documentation of any issues and/or concerns.

ii. Documentation of referrals of noncompliant construction sites and/or enforcement actions taken at construction sites to include, at a minimum, the following:

1. Name of owner/operator
2. Location of construction project;
3. Description of violation;
4. Required schedule for returning to compliance;
5. Description of enforcement response used, including escalated responses if repeat violations occur; and
6. Accompanying documentation of enforcement responses (e.g. notices of non-compliance, notices of violations, etc).

iii. Records of public complaints including:

1. Date, time and description of the complaint;
2. Location of subject construction sites; and
3. Identification of any actions taken (e.g. inspections, enforcement, corrections). Identifying information must be sufficient to cross-reference inspection and enforcement records.

e. The Permittee shall report each year in the annual report the following information:

i. A description of any completed or planned revisions to the ordinance or regulatory mechanism required by Part III.B.3.a.i and the most recent copy, or a link to the ordinance; and

ii. List of all active construction sites within the MS4 to include the following summary:

1. Number of construction site inspections;
2. Number of non-compliant construction site referrals and/or enforcement actions and description of violations;
3. Number of construction site runoff complaints received; and
4. Number of MS4 staff/inspectors trained.

4. Post-Construction Storm Water Management in New Development and Redevelopment

a. Post-construction storm water management refers to the activities that take place after construction occurs, and includes structural and non-structural controls including low-impact development and green infrastructure practices to obtain permanent storm water management over the life of the property's use. These post construction controls should be considered during the initial site development planning phase.

i. The Permittee must develop/revise, implement, and enforce a program to address storm water runoff from qualifying new development and redevelopment projects, to the maximum extent practicable. This program shall ensure that controls are in place to prevent or minimize water quality impacts. Specifically, the Permittee shall:

1. Develop/revise and outline in the SWMPP procedures for the site-plan review and approval process and a required re-approval process when changes to post-construction controls are required; and
2. Develop/revise and outline in the SWMPP procedures for a post-construction process to demonstrate and document that post-construction storm water measures have been installed per design specifications, which includes enforceable procedures for bringing noncompliant projects into compliance.

ii. The Permittee must develop and implement strategies which may include a combination of structural and/or non-structural BMPs designed to ensure, to the maximum extent practicable, that the volume and velocity of pre-construction stormwater runoff is not significantly exceeded. A design rainfall event with an intensity up to that of a 2yr-24hr storm event shall be the basis for the design and implementation of post- construction BMPs.

iii. To the extent allowable under State law, the Permittee must develop and institute the use of an ordinance or other regulatory mechanism to address post-construction runoff from qualifying new development and redevelopment projects.

iv. The Permittee must require adequate long-term operation and maintenance of BMPs. One or more of the following as applicable:

1. The developer's signed statement accepting responsibility for maintenance until the maintenance responsibility is legally transferred to another party; and/or
2. Written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance; and/or
3. Written conditions in project conditions, covenants and restrictions for residential properties assigning maintenance responsibilities to a home owner's association, or other appropriate group, for maintenance of structural and treatment control management practices; and/or
4. Any other legally enforceable agreement that assigns permanent responsibility for maintenance of structural or treatment control management practices.

v. The Permittee shall perform or require the performance of post-construction inspections, at a minimum of once per year, to confirm that post-construction BMP's are functioning as designed. The Permittee shall include an inspection schedule, to include inspection frequency, within the SWMPP.

vi. The Permittee shall maintain or require the developer/owner/operator to keep records of post-construction inspections, maintenance activities and make them available to the Department upon request and require corrective actions to poorly functioning or inadequately maintained post-construction BMP's.

vii. The Permittee shall review and evaluate policies and ordinances related to building codes, or other local regulations, with a goal of identifying regulatory and policy impediments to the installation of green infrastructure and low-impact development techniques.

b. The Permittee shall report each year in the annual report the following information:
   i. Copies of, or link to, the ordinance or other regulatory mechanism required by Part III.B.4.a.iii;
   ii. A list of the post-construction structural controls installed and inspected during the permit year;
   iii. Updated inventory of post-construction structural controls including those owned by the Permittee;
   iv. Number of inspections performed on post-construction structural controls; and,
   v. Summary of enforcement actions.

5. Pollution Prevention/Good Housekeeping for Municipal Operations

a. The Permittee shall develop, implement, and maintain a program that will prevent or reduce the discharge of pollutants in storm water run-off from municipal operations to the maximum extent practicable. The program elements shall include, at a minimum, the following:

i. An inventory of all municipal facilities, including municipal facilities that have the potential to discharge pollutants via storm water runoff;
ii. Strategies for the implementation of BMPs to reduce litter, floatables and debris from entering the MS4 and evaluate those BMPs annually to determine their effectiveness. If a BMP is determined to be ineffective or infeasible, then the BMP must be modified. The Permittee shall also develop a plan to remove litter, floatable and debris material from the MS4, including proper disposal of waste removed from the system;
iii. A Standard Operating Procedures (SOP) detailing good housekeeping practices to be employed at appropriate municipal facilities and during municipal operations that may include, but not limited to, the following:
    1. Equipment washing;
    2. Street sweeping;
    3. Maintenance of municipal roads including public streets, roads, and highways, including but not limited to unpaved roads, owned, operated, or under the responsibility of the Permittee;
    4. Storage and disposal of chemicals, Pesticide, Herbicide and Fertilizers (PHFs) and waste materials;
    5. Vegetation control, cutting, removal, and disposal of the cuttings;
    6. Vehicle fleets/equipment maintenance and repair;
    7. External Building maintenance; and
    8. Materials storage facilities and storage yards.
iv. A program for inspecting municipal facilities for good housekeeping practices, including BMPs. The program shall include checklists and procedures for correcting noted deficiencies;
v. A training program for municipal facility staff in good housekeeping practices as outlined in the SOP developed pursuant to Part III.B.5.a.iii; and

b. The Permittee shall include within the SWMPP the following information:
    i. The inventory of municipal facilities required by Part III.B.5.a.i;
    ii. Schedule for developing the SOP of good housekeeping practices required by Part III.B.5.a.iii;
    iii. An inspection plan and schedule, including checklists and any other materials needed to comply with Part III.B.5.a.iv; and
    iv. A description of the training program and training schedule required by Part III.B.5.a.v.

c. The Permittee shall report each year in the annual report the following information:
    i. Any updates to the municipal facility inventory;
    ii. An estimated amount of floatable material collected from the MS4 as required by Part III.B.5.a.ii;
    iii. Any updates to the inspection plan
    iv. The number of inspections conducted; and
    v. Any updates to the SOP of good housekeeping practices.

d. The Permittee shall maintain the following information and make it available upon request:

i. Records of inspections and corrective actions, if any; and

ii. Training records including the dates of each training activities and names of personnel in attendance.

PART IV Special Conditions

A. Responsibilities of the Permittee

1. If the Permittee is relying on another entity to satisfy one or more requirements of this permit, then the Permittee must note that fact in the SWMPP. The Permittee remains responsible for compliance with all requirements of this permit, except as provided by Part III.B.3.b and reliance on another entity will not be a defense or justification for non-compliance if the entity fails to implement the permit requirements.
2. If the Permittee is relying on the Department for the enforcement of erosion and sediment controls on qualifying construction sites and has included that information in the SWMPP as required by Part III.A.3.e., the Permittee is not responsible for implementing the requirements of Part III.B.3.b of this permit as long as the Department receives notification of non-compliant qualifying constructions sites from the Permittee as required by Part III.B.3.a.v.

B. SWMPP Plan Review and Modification

1. The Permittee shall submit a SWMPP and/or revised SWMPP to the Department as required by Part II.A of the permit. The Permittee shall implement plans to seek and consider public input in the development, revision and implementation of this SWMPP, as required by Part III.B.1.b.i. Thereafter, the Permittee shall perform an annual review of the current SWMPP and must revise the SWMPP, as necessary, to maintain compliance with the permit. Any revisions to the SWMPP shall be submitted to the Department at the time a revision is made for the Department review. Revisions made to the SWMPP may include, but are not limited to, the replacement of ineffective or infeasible BMPs or the addition of components, controls and requirements; and
2. The Permittee shall implement the SWMPP on all new areas added to their municipal separate storm sewer system (or for which they become responsible for implementation of storm water quality controls) as soon as practicable, but not later than one (1) year from addition of the new areas. Implementation of the program in any new area shall consider the plans of the SWMPP of the previous MS4 ownership, if any.

C. Discharge Compliance with Water Quality Standards

This general permit requires, at a minimum, that the Permittee develop, implement and enforce a storm water management program designed to reduce the discharge of pollutants to the

maximum extent practicable. Full implementation of BMPs, using all known, available, and reasonable methods of prevention, control and treatment to prevent and control storm water pollution from entering waters of the State of Alabama is considered an acceptable effort to reduce pollutants from the municipal storm drain system to be the maximum extent practicable.

D. Impaired Waters and Total Maximum Daily Loads (TMDLs)

1. The Permittee must determine whether the discharge from any part of the MS4 contributes directly or indirectly to a waterbody that is included on the latest §303(d) list or designated by the Department as impaired;

2. If the Permittee's MS4 discharges to a waterbody included on the latest §303(d) or designated by the Department as impaired, it must demonstrate the discharges, as controlled by the Permittee, do not cause or contribute to the impairment. The SWMPP must detail the BMPs that are being utilized to control discharges of pollutants associated with the impairment. If existing BMPs are not sufficient to achieve this demonstration, the Permittee must, within six (6) months following the publication of the latest final §303(d) list, Department designation, or the effective date of this permit, submit a revised SWMPP detailing new or modified BMPs. The SWMPP must be revised as directed by the Department and the new or modified BMPs must be implemented within one year from the publication of the latest final §303(d) list or Department designation.

3. Permittees discharging from MS4s into waters with EPA-Approved TMDLs and/or EPA-Established TMDLs

    a. The Permittee must determine whether its MS4 discharges to a waterbody for which a total maximum daily load (TMDL) has been established or approved by EPA. If an MS4 discharges into a water body with an EPA approved or established TMDL, then the SWMPP must include BMPs targeted to meet the assumptions and requirements of the TMDL. If additional BMPs will be necessary to meet the requirements of the TMDL, the SWMPP must include a schedule for installation and/or implementation of such BMPs. A monitoring component to assess the effectiveness of the BMPs in achieving the TMDL requirements must also be included in the SWMPP. Monitoring can entail a number of activities including, but not limited to: outfall monitoring, in-stream monitoring, and/or modeling. Monitoring data, along with an analysis of this data, shall be included in the Annual Report.

    b. If, during this permit cycle, a TMDL is approved by EPA or a TMDL is established by EPA for any waterbody into which an MS4 discharges, the Permittee must review the applicable TMDL to see if it includes requirements for control of storm water discharges from the MS4.

        1. If it is found that the Permittee must implement specific allocations of the TMDL, it must assess whether the assumptions and requirements of the TMDL are being met through implementation of existing BMPs or if additional BMPs are necessary. The SWMPP must include BMPs targeted to meet the assumptions and requirements of the TMDL. If existing BMPs are not sufficient, the Permittee must, within six (6)

months following the approval or establishment of the TMDL by EPA, submit a revised SWMPP detailing new or modified BMPs to be utilized along with a schedule of installation and/or implementation of such BMPs. Any new or modified BMPs must be implemented within one year, unless an alternate date is approved by the Department, from the establishment or approval of the TMDL by EPA. A monitoring component to assess the effectiveness of the BMPs in achieving the TMDL requirements must also be included in the SWMPP. Monitoring can entail a number of activities including, but not limited to: outfall monitoring, in-stream monitoring, and/or modeling. Monitoring data, along with an analysis of this data, shall be included in the Annual Report.

E. Requiring an Individual Permit

The Department may require any person authorized by this permit to apply for and/or obtain an individual NPDES permit. When the Department requires application for an individual NPDES permit, the Department will notify the Permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application from and a statement setting a deadline for the Permittee to file the application.

PART V Monitoring and Reporting

1. If there are no 303(d) listed or TMDL waters located within the Permittee's MS4 area, no monitoring shall be required. The SWMPP shall include a determination stating if monitoring is required.
2. If a waterbody within the MS4 jurisdiction is listed on the latest final §303(d) list, or otherwise designated impaired by the Department, or for which a TMDL is approved or established by EPA, during this permit cycle, then the Permittee must implement a monitoring program, within 6 months, to include monitoring that addresses the impairment or TMDL. A monitoring plan shall be included in the SWMPP and any revisions to the monitoring program shall be documented in the SWMPP and Annual Report.
3. Proposed monitoring locations, and monitoring frequency shall be described in the monitoring plan with actual locations described in the annual report;
4. The Permittee must include in the monitoring program any parameters attributed with the latest final §303(d) list or otherwise designated by the Department as impaired or are included in an EPA-approved or EPA-established TMDL;
5. Analysis and collection of samples shall be done in accordance with the methods specified at 40 CFR Part 136. Where an approved 40 CFR Part 136 does not exist, then a Department approved alternative method may be used;
6. If the Permittee is unable to collect samples due to adverse conditions, the Permittee must submit a description of why samples could not be collected, including available documentation of the event. An adverse climatic condition which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.)

or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.);

7. Monitoring results must be reported with the subsequent Annual Report and shall include the following monitoring information:

    a. The date, latitude/longitude of location, and time of sampling;
    b. The name(s) of the individual(s) who performed the sampling;
    c. The date(s) analysis were performed;
    d. The name(s) of individuals who performed the analysis;
    e. The analytical techniques or methods used; and
    f. The results of such analysis.

PART VI Annual Reporting Requirements

1. The Permittee shall submit to the Department an annual report (1 hardcopy and 1 electronic copy) no later than May 31st of each year. The annual report shall cover the previous April 1 to March 31. If an entity comes under coverage for the first time after the issuance of this permit, then the first annual report should cover the time coverage begins until March 31st of subsequent year.
2. **On or after December 21, 2020, all annual reports shall be submitted to the Department electronically in a prescribed manner acceptable to the Department.**
3. The Permittee shall sign and certify the annual report in accordance with Part VII.G.
4. The annual report shall include the following information, at a minimum, and in addition to those requirements referenced in Part III-V:

    a. A list of contacts and responsible parties (e.g.: agency, name, phone number, address, & email address) who had input to and are responsible for the preparation of the annual report;
    b. Overall evaluation of the storm water management program developments and progress for the following:
        i. Major accomplishments;
        ii. Overall program strengths/weaknesses;
        iii. Future direction of the program;
        iv. Overall determination of the effectiveness of the SWMPP taking into account water quality/watershed improvements;
        v. Measureable goals that were not performed and reasons why the goals were not accomplished; and
        vi. If monitoring is required, evaluation of the monitoring data.
    c. Narrative report of all minimum storm water control measures referenced in Part III.B of this permit. The activities shall be discussed as follows:
        i. Minimum control measures completed and in progress;
        ii. Assessment of the controls; and
        iii. Discussion of proposed BMP revisions or any identified measureable goals that apply to the minimum storm water control measures.

d. Summary table of the storm water controls that are planned/scheduled for the next reporting cycle;
e. Results of information collected and analyzed, if any, during the reporting period, including any monitoring data used to assess the success of the program at reducing the discharge of pollutants to the MEP.
f. Notice of reliance on another entity to satisfy some of your permit obligations; and
g. If monitoring is required, all monitoring results collected during the previous year in accordance with Part V, if applicable. The monitoring results shall be submitted in a format acceptable to the Department.

PART VII Standard and General Permit Conditions

A. Duty to Comply

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of CWA and is ground for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

B. Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the ADEM Code r. 335-6-6 and remain in force and effect if the Permittee re-applies for coverage as required under Part II of this Permit. Any Permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:

1. Reissuance or replacement of this permit, at which time you must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
2. Issuance of an individual permit for your discharges; or
3. A formal permit decision by the Department not to reissue this general permit, at which time you must seek coverage under an alternative general permit or an individual permit.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

E. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, suspending, or terminating the permit or to determine compliance with the permit. The Permittee shall also furnish to the Director upon request, copies of records required to be kept by the permit.

F. Other Information

If you become aware that you have failed to submit any relevant facts in your Notice of Intent or submitted incorrect information in the Notice of Intent or in any other report to the Department, you must promptly submit such facts or information.

G. Signatory Requirements

All Notices of Intent, reports, certifications, or information submitted to the Department, or that this permit requires be maintained by you shall be signed and certified as follows:

1. Notice of Intent. All Notices of Intent shall be signed by a responsible official as set forth in ADEM Admin. Code r. 335-6-6-.09.
2. Reports and other information. All reports required by the permit and other information requested by the Department or authorized representative of the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    a. Signed authorization. The authorization is made in writing by a person described above and submitted to the Department.
    b. Authorization with specified responsibility. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility for environmental matters for the regulated entity.
3. Changes to authorization. If an authorization is no longer accurate because a different operator has the responsibility for the overall operation of the MS4, a new authorization satisfying the requirement of Part VII.G.2.b. above must be submitted to the Department prior to or together with any reports or information, and to be signed by an authorized representative.
4. Certification. Any person signing documents under Part VII.G.1-2. above shall make the following certification:

    "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, nor it does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

I. Proper Operation and Maintenance

You must at all time properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit and with the conditions of your SWMPP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary

facilities or similar systems, installed by you only when the operation is necessary to achieve compliance with the conditions of the permit.

J. Inspection and Entry

1. You must allow the Department or an authorized representative upon the presentation of credentials and other documents as may be required by law, to do any of the following:
    a. Enter your premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
    b. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;
    c. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment) practices, or operations regulated or required under this permit; and
    d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

K. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

L. Permit Transfers

This permit is not transferable to any person except after notice to the Department. The Department may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the Act.

M. Anticipated Noncompliance

You must give advance notice to the Department of any planned changes in the permitted small MS4 or activity which may result in noncompliance with this permit.

N. Compliance with Statutes and Rules

1. The permit is issued under ADEM Admin. Code r. 335-6-6. All provisions of this chapter that are applicable to this permit are hereby made a part of this permit.
2. This permit does not authorize the noncompliance with or violation of any laws of the State of Alabama or the United States of America or any regulations or rules implementing such laws.

O. Severability

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall be affected thereby.

P. Bypass Prohibition

Bypass (see 40 CFR 122.41(m)) is prohibited and enforcement action may be taken against a regulated entity for a bypass; unless:

1. The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during the normal periods of equipment downtime. This condition is not satisfied if the regulated entity should, in the exercise of reasonable engineering judgment, have installed adequate backup equipment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.
3. The Permittee submits a written request for authorization to bypass to the Director at least ten (10) days prior to the anticipated bypass (if possible), the Permittee is granted such authorization, and the Permittee complies with any conditions imposed by the Director to minimize any adverse impact on human health or the environment resulting from the bypass.

The Permittee has the burden of establishing that each of the conditions of Part VII.P. have been met to qualify for an exception to the general prohibition against bypassing and an exemption, where applicable, from the discharge specified in this permit.

Q. Upset Conditions

An upset (see 40 CFR 122.41(n)) constitutes an affirmative defense to an action brought for noncompliance with technology-based permit limitations if a regulated entity shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

1. An upset occurred and the Permittee can identify the specific cause(s) of the upset;
2. The Permittee's facility was being properly operated at the time of the upset; and
3. The Permittee promptly took all reasonable steps to minimize any adverse impact on human health or the environment resulting from the upset.

The Permittee has the burden of establishing that each of the conditions of Part VII.Q. of this permit have been met to qualify for an exemption from the discharge specified in this permit.

R. Procedures for Modification or Revocation

Permit modification or revocation will be conducted according to ADEM Admin. Code r. 335-6-6-.17.

S. Re-opener Clause

If there is evidence indicating potential or realized impacts on water quality due to storm water discharge covered by this permit, the regulated entity may be required to obtain an individual permit or an alternative general permit or the permit may be modified to include different limitations and/or requirements.

T. Retention of Records

1. The Permittee shall retain the storm water quality management program developed in accordance with Part III-V of this permit until at least five years after coverage under this permit terminates.
2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. The Permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of reports required by this permit, and records of all data used to

complete the application of this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended at the request of the Director at any time.

U. Monitoring Methods

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

V. Additional Monitoring by the Permittee

If the Permittee monitors more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the monitoring report. Such increased monitoring frequency shall also be indicated on the monitoring report.

W. Definitions

1. Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
2. Control Measure as used in this permit, refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to waters of the State.
3. CWA or The Act means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.
4. Department means the Alabama Department of Environmental Management or an authorized representative.
5. Discharge, when used without a qualifier, refers to "discharge of a pollutant" as defined as ADEM Admin. Code r. 335-6-6-.02(m).
6. Green Infrastructure refers to systems and practices that use or mimic natural processes to infiltrate, evapotranspirate (the return of water to the atmosphere either through evaporation or by plants), or reuse storm water or runoff on the site where it is generated.
7. Illicit Connection means any man-made conveyance connecting an illicit discharge directly to municipal separate storm sewer.
8. Illicit Discharge is defined at 40 CFR Part 122.26(b)(2) and refers to any discharge to a municipal separate storm sewer that is not entirely composed of storm water, except discharges authorized under an NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire fighting activities.
9. Indian Country, as defined in 18 USC 1151, means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State, and (c) all Indian allotments, the Indian titles to which have

not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.

10. Infiltration means water other than wastewater that enters a sewer system, including foundation drains, from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.
11. Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.
12. Large municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 250,000 or more as determined by the latest decennial census.
13. Low Impact Development (LID) is an approach to land development (or re-development) that works with nature to manage storm water as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product.
14. Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more but less than 250,000 as determined by the latest decennial census.
15. MEP is an acronym for "Maximum Extent Practicable," the technology-based discharge standard for municipal separate storm sewer systems to reduce pollutants in storm water discharges that was established by CWA Section 402(p). A discussion of MEP as it applies to small MS4s is found at 40 CFR Part 122.34.
16. MS4 is an acronym for "Municipal Separate Storm Sewer System" and is used to refer to either a large, medium, or small municipal separate storm sewer system. The term is used to refer to either the system operated by a single entity or a group of systems within an area that are operated by multiple entities.
17. Municipal Separate Storm System is defined at 40 CFR Part 122.26(b)(8) and means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined in ADEM Admin. Code r. 335-6-6-.02(nn).
18. NOI is an acronym for "Notice of Intent" to be covered by this permit and is the mechanism used to "register" for coverage under a general permit.
19. Permittee means each individual co-applicant for an NPDES permit who is only responsible for permit conditions relating to the discharge that they own or operate.
20. Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling

stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

21. Priority construction site means any qualifying construction site in an area where the MS4 discharges to a waterbody which is listed on the most recently approved 303(d) list of impaired waters for turbidity, siltation, or sedimentation, any waterbody for which a TMDL has been finalized or approved by EPA for turbidity, siltation, or sedimentation, and any waterbody assigned specific water quality criteria, such as Outstanding Alabama Water use classification, in accordance with ADEM Admin. Code r. 335-6-10-.09 and any waterbody assigned a special designation in accordance with ADEM Admin. Code r. 335-6-10-.10.
22. Qualifying Construction Site means any construction activity that results in a total land disturbance of one or more acres and activities that disturb less than one acre but are part of a larger common plan of development or sale that would disturb one or more acres. Qualifying construction sites do not include land disturbance conducted by entities under the jurisdiction and supervision of the Alabama Public Service Commission.
23. Qualifying New Development and Redevelopment means any site that results from the disturbance of one acre or more of land or the disturbance of less than one acre of land if part of a larger common plan of development or sale that is greater than one acre. Qualifying new development and redevelopment does not include land disturbances conducted by entities under the jurisdiction and supervision of the Alabama Public Service Commission.
24. Small municipal separate storm sewer system is defined at 40 CFR Part 122.26(b)(16) and refers to all separate storm sewers that are owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to water of the United States, but is not defined as "large" or "medium" municipal separate storm sewer system. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.
25. Storm water is defined at 40 CFR Part 122.26(b) (13) and means storm water runoff, snow melt runoff, and surface runoff and drainage.
26. Storm Water Management Program (SWMP) refers to a comprehensive program to manage the quality of storm water discharged from the municipal separate storm sewer system.
27. SWMP is an acronym for "Storm Water Management Program."
28. Total Maximum Daily Load (TMDL) means the calculated maximum permissible pollutant loading to a waterbody at which water quality standards can be maintained. The sum of wasteload allocations (WLAs) and load allocations (LAs) for any given pollutant.

29. You and Your as used in this permit is intended to refer to the Permittee, the operator, or the discharger as the context indicates and that party's responsibilities (e.g., the city, the country, the flood control district, the U.S. Air Force, etc.).

APPENDIX B

URBANIZED AREA MAP

Legend

- Major Receiving Waters
- Storm Sewer (Asset Inventory Ongoing)
- Old Storm Sewer Survey
- Hydrology in City Limits
- Streets
- Auburn, Alabama Urbanized Area - 2013 Census
- Auburn University Property
- Auburn City Limits
- Opelika City Limits

Highway 280

Interstate 85

Saugahatchee Creek

Highway 14

Moore's Mill Creek

Parkerson Mill Creek

Town Creek

Choctafaula Creek

Chewacla Creek

N

W E

S

0 0.75 1.5 3 Miles

City of Auburn Urban Area and Storm Sewer Stats

Auburn, Alabama Urbanized Area	50.27 Sq. Miles
Auburn City Limits within Urbanized Area	26.80 Sq. Miles
Estimated Storm Sewer Main	*126 Linear Miles
Extent Storm Sewer Surveyed in 2016	54.4 Linear Miles
Hydrology	
Stream in City Limits	286 Linear Miles
Ponds/Lakes in City Limits	667 Impoundments
Wetlands in City Limits	370+ Acres

APPENDIX C

NEWSPAPER PUBLICATIONS - 2016

http://www.oanow.com/opinion/columns/miller-keeping-creeks-waterways-clean/article_e9f458ae-4916-11e6-81e0-1b610b597ab4.html

Miller: Keeping creeks, waterways clean

Tipi Colley Miller | Columnist Jul 13, 2016

Last weekend, we celebrated Independence Day with a trip to my in-law's home in north Alabama. During our visit, we took the children to Little River Canyon to swim. The cool temperature of the water was refreshing since outdoor temperatures were in the mid-90s.

The river was clear, and our toddler enjoyed collecting rocks from the shallow water in the beach area. Our older kids jumped off large rocks and loved diving to the bottom of the river. The backdrop of the river was luscious green grass that swayed with the light breeze. Our setting was a picturesque moment.

After a relaxing holiday weekend, I returned to my office on Tuesday. That morning I had an Opelika Business Clean Water Partnership meeting. This group was created from representatives from the city of Opelika Engineering Department, Keep Opelika Beautiful, Opelika Chamber of Commerce, Opelika Utilities and Save Our Saugahatchee. The Opelika Business Clean Water Partnership began several months ago when John Harris, storm water manager with the city of Opelika, was visiting a creek in Opelika and found it to be littered. The most popular litter found that day was plastic grocery bags and sale papers. The creek is not easily accessible, and the litter did not come from people visiting the creek. The litter was blown into the creek bed from neighboring businesses.

With a quick look in the trees, John realized that the trees had some of the litter as well. Have you ever walked through a parking lot on a windy or rainy day and your receipt blows away? Sometimes you can catch it, and sometimes it's gone for good.

This is one example of how litter can end up in the creeks. John Harris and Scott Parker, Opelika City engineer, met together to discuss the problems with business litter. These gentlemen called a meeting of the minds, and the Opelika Business Clean Water Partnership was created. The goal of the partnership is for representatives from the partnership to work with businesses to keep litter out of the local waterways.

The advantage for the businesses is that by maintaining a clean parking lot, patrons are more likely to frequent the business. Each participating business will receive a door decal publicizing their involvement. This program helps Opelika because our waterways will be clear of debris and trash. Since we are still in the learning phase, the OCBWP initial test case is a section of the Pepperell Parkway corridor. We will be hosting a breakfast in August to explain the program and encourage businesses to become involved.

Let's make sure our creeks and other waterways stay beautiful for the next generation. If you have a passion for clean water, clean businesses and a clean community, we would love your involvement.

Tipi Colley Miller is the director of Keep Opelika Beautiful Inc. and writes a weekly column. Contact her at kob@opelika.com.

http://www.oanow.com/opinion/columns/miller-what-are-you-doing/article_95e8fd8c-fc13-11e5-94c7-6f07ce462b7e.html

Miller: What are you doing?

Tipi Colley Miller, columnist Apr 6, 2016

Todd Van Emst/tvemst@oanow.com

Daniel Ballard talks to kids about making a water filter during the Lee County Water Festival Tuesday in Auburn.

Last week, I spent one day at a local primary school talking to the students about recycling. Administrators and teachers at the school created the first Service Day for the students. The goal was to teach the students how to give back to their community.

Programs administered by other organizations included planting flowers with the students, cleaning up litter and demonstrating how to properly plant a tree. Volunteers from the involved organizations were not paid for their time and materials. Why would anyone spend their day helping educate youngsters on a beautiful environment? The secret is that it is not really about volunteers, it is about creating environmental stewards.

The motive is the kindergartner that listened intently during the tree planting demonstration and asked why the tree root should be broken up. The reason might be the high school student that threw a plastic cup out their car window one week and is cleaning the roadside the next week.

The purpose is the older adult that has great concern for their bank statements and would like to watch a machine shred each piece of paper. Each of the volunteers that participated in the school's Service Day are simply one of the vehicles to creating responsible citizens.

What are the other channels for relaying the importance of beautiful environment?

The most important and influential group are parents and grandparents. Whether you are 9 or 90, you have some observations from your parents' and grandparents' view of the environment. I am not implying global warming, climate change, pollution and other political hot spots. Did someone take the time to show you how to plant a seed? Did you ever hear "waste not, want not." Was yard work a family chore? Every Keep Opelika Beautiful event can be a family activity. It is never too early or too late for children to see their parents making responsible choices. What are you demonstrating to your children and grandchildren?

Another means for teaching sensible decisions are our school teachers. Whether it is reminding the second grader to put the paper in the recycling container or teaching an eighth grader about gases emitted from a landfill, the teachers are doing a fabulous job.

This week kicks off the annual Water Festival at Auburn University. Fourth graders from Opelika City Schools, Auburn City School and Lee County Schools have been traveling to the AU campus to learn about edible aquifers, water cycle and mini-filtration.

Students create projects such as an aquifer made of Sprite, ice, chocolate syrup and ice cream. Each yummy ingredient represents some natural or man-made that effects water seeping into the ground. These classes are taught by local engineers, teachers, an environmentalist, a horticulturist and other experts.

The volunteers take time from their job to teach these students. You don't have to be an expert in storm water or recycling to make a difference. What are you doing to make the community a more beautiful place?

Tipi Colley Miller is the director of Keep Opelika Beautiful Inc. and writes a weekly column. Contact her at kob@opelika.com.

http://www.oanow.com/news/lee_county/h-offers-environmental-workshops-for-teachers/article_b1c8e7c2-29d8-11e6-b184-9b62229725ac.html

4-H offers environmental workshops for teachers

From submitted reports Jun 5, 2016

The 4-H Alabama Water Watch Program is partnering with five environmental centers around the state to provide a series of workshops for teachers and volunteer educators. Participants will have the opportunity to learn how to use the Exploring Our Living Streams Biomonitoring and Water Chemistry Monitoring curriculum.

The curriculum provides hands-on activities for teaching students about watershed science, and provides educators with the skills and platform to involve students in citizen science focused on water quality.

During the two-day workshops, participants will be certified as water monitors and will learn how they can certify their students as 4-H AWW Water Monitors. In addition, staff of each environmental center will provide unique programming that represents what they have to offer educators and students.

Workshop locations and dates are:

> Troy University in Phenix City, Riverfront Campus, June 7-9.

> Weeks Bay Watershed Program and Foundation in Fairhope, June 14-16.

> Servants in Faith and Technology (SIFAT) in Lineville, June 28-30.

> Black Belt Conservation and Research Institute at the University of West Alabama in Livingston, July 12-14.

> McDowell Environmental Center in Nauvoo, July 28.

Participants who complete the workshops can receive Continuing Education Units from Auburn University. Lodging and food will be provided.

Registration fee for each workshop is $25. For additional information and registration, visit www.alabamawaterwatch.org.

http://www.oanow.com/news/auburn/fourth-graders-learn-about-water-quality-at-th-annual-lee/article_3f623026-fb93-11e5-8e13-d31c3c6cae81.html

Fourth graders learn about water quality at 13th annual Lee County Water Festival

Meagan Hurley| Reporter
Opelika-Auburn News
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Apr 5, 2016

Todd Van Emst/tvemst@oanow.com

Daniel Ballard talks to kids about making a water filter during the Lee County Water Festival Tuesday in Auburn.

Hundreds of Lee County fourth graders took field trips to the Auburn University Coliseum this week to learn from local and state officials about water quality at the 13th annual Lee County Water Festival.

Over the course of Monday and Tuesday, students from Loachapoka, Northside School, Morris Avenue Intermediate, Beauregard, Beulah, Wacoochee, West Forest and Smiths Station heard presentations and participated in activities with representatives from Auburn, Opelika and Lee County, the Alabama Agricultural Extension Office, the Department of Agriculture's Natural Resources Conservation Service and the Clean Water Partnership -- all aimed at teaching children the importance of water quality, conservation and recycling.

"We're going to learn about all things water," said Daniel Ballard to a group of giddy West Smiths Station students Tuesday, as he prepared them to build their own miniature water filtration systems.

"What we're going to do is we're going to show you guys how we treat water," he said.

Children also participated in activities including illustrations and demonstrations of aquifers and the water cycle.

"It was a lot of fun," said Opelika City Engineer Scott Parker. "We're all looking to provide education and awareness."

Every municipality in the area and Auburn University, through a permit issued by the Alabama Department of Environmental Management, is tasked with providing water quality enforcement, outreach and education to citizens, Parker said.

"The best way to do that is to start people when they're young because they'll go and tell others," he said. "This is giving them something to take home, to talk about and remember. It's beneficial for everybody."

http://www.oanow.com/news/extension-experts-say-rainwater-harvesting-could-revolutionize-poultry-industry/article_39ef61bc-16ce-11e6-b478-57d5f5c07bec.html

Extension experts say rainwater harvesting could revolutionize poultry industry

By Maggie Lawrence Special to the News May 10, 2016

Contributed by Auburn University

A 100-foot-by-36-foot flexible bladder holds rainwater from a gutter system.

Raising broiler chickens takes water – a lot of water. But rainwater harvesting could substantially reduce Alabama poultry growers' dependence on municipal water sources or well water and reduce growers' annual water bills by as much as $16,000 or more and pay for itself in as few as four to five years.

Gene Simpson, a specialist with the Alabama Cooperative Extension System, says that a typical farm with four poultry houses uses between 1.8 and 2 million gallons of water every year.

"If they are using water from a municipal water system, a four-house farm has a water bill that could be as high as $22 thousand annually," said Simpson, who is also the associate director of Auburn University's National Poultry Technology Center, or NPTC. "That is a direct, out-of-pocket expense to growers."

Simpson says the center has been investigating the merits of rainwater harvesting for poultry operations for about seven years.

"Our goal then was to develop ways that producers could reduce their reliance on municipal water sources by 80 percent or more," he said.

The center's most recent prototype was placed on a farm in Cullman County.

"We had to test it some place with high water rates, and Cullman County fit the bill," he said. "In 2015, producers paid just under $10 per 1,000 gallons and rates for 2016 are expected to increase to $11."

Simpson noted that harvesting and storing thousands gallons of water is significantly more complex than the gutter and rain barrel system that many homeowners are familiar with.

A gutter system funnels rainwater from the poultry house roofs into a 100-foot-by-36-foot flexible bladder. A 2-inch rain on the 82,000 square feet of roof space will fill the bladder to its 100,000-gallon capacity. A control room pumps the collected water to the houses as needed and will automatically switch over to municipal water in the event of an emergency.

Just as important as the volume of water is the quality of water. The growing birds need clean water free of impurities and the houses' cooling systems need water low in dissolved minerals to work efficiently.

"The water quality is excellent," said Simpson. "It is filtered multiple times including through an ultraviolet light filter that kills any bacterial contamination."

Alabama Extension Director Gary Lemme says Extension and the National Poultry Technology Center's work with poultry producers is important to the entire industry.

"The center's mission is simple – help poultry producers raise a quality product profitably," said Lemme. "And they are fulfilling that mission every day with their innovative work."

Paul Patterson, dean of the Auburn University College of Agriculture and director of the Alabama Agricultural Experiment Station, agrees with Lemme.

"The rainwater harvesting project is just one example of how the Alabama Agricultural Experiment Station and the NPTC provide timely, applied research to help improve the profitability and environmental sustainability of our poultry industry," said Patterson.

Simpson and his colleagues believe that the new system could help producers reduce their municipal water bills by as much as 90 percent. While the systems are a significant capital investment, he said farms should expect the system to have paid for itself in about seven to eight years.

"But if the U.S. Department of Agriculture's Natural Resource Conservation Service were to develop a cost share program, the system would pay for itself in as little as three and a half to four years," Simpson said.

He says rainwater harvesting is a strong option for growers who have high water rates, have a low availability of well water or have water with significant quality issues.

Maggie Lawrence is an employee of Auburn University.

http://www.oanow.com/news/auburn/county-flood-damage-nears-million/article_56c87a7a-bce3-11e5-834d-9376eef50bec.html

County

County flood damage nears $1 million

Sara Falligant | Opelika-Auburn News | **Twitter** Jan 17, 2016

Todd Van Emst/tvemst@oanow.com

Lee Road 188 fell through almost completely as the rain eroded material underneath the road.

Days of heavy rain during the Christmas holiday forced area children to wait inside while brand new swing sets and bicycles went unused. And with some parts of Lee County collecting as much as 14 inches of rain during the month of December, the flooding also racked up nearly $1 million in infrastructure damages.

Lee County Emergency Management Agency officials, county Highway Department employees, volunteer firefighters and sheriff's deputies worked together Christmas Eve through New Year's Day to combat road damage caused by the severe flooding seen across Alabama.

At one point, the Highway Department had seven emergency road closures, including a closure in Beauregard on Lee Road 42, flooding on Lee Road 50, a washout on 138 and cross drain failure on Lee Road 182 northeast of Opelika.

"These had us scrambling Christmas Eve to get barricades in place, as calls were coming in through the sheriff's dispatch office, through EMA to our guys," county engineer Justin Hardee said. "We had numerous employees out Christmas Eve for nine hours trying to get roads blocked, trying to get roads open in instances where we could and to protect the public. And the rains kept coming. As you know, they kept coming Christmas Day. The second wave, if you will, came after that closer to New Years, which continued to impact us because by that time, all the ground was completely saturated. So anything that did fall was surface runoff that was going through the pipes at fast speeds or over the roads and into yards."

The bulk of the damage was seen in Loachapoka and southwest Lee County, Hardee continued. Most of the county saw between seven and eight inches of rain during that period.

"In some areas, they've mentioned it's a once in 500 years flood," Lee County EMA Director Kathy Carson said. "I don't think it's been determined in the entire state, but it was up there."

Lee County roads saw more than $535, 000 in damages in the seven-day period. Waters washed out sections of pipe under roads – causing the roads themselves to blow out entirely – eroded back wall material on bridges and created huge potholes on highly traveled roads across the county.

“Holes got large,” Hardee said. “With that amount of rain and with the traffic pounding into them, they got very large. We were out there throughout the holidays, nearly every day, trying to get material back in the holes.”

Because the rain kept pouring, the new material was also wet.

All but three of the seven road closures are back open. Lee roads 001, 182 and 188 are still closed. Wednesday, the Highway Department was also forced to close Lee Road 651 near Roxanna due to residual flood damage.

Lee Road 188, near the Macon County line, fell through almost completely as the rain eroded material underneath the road.

“On Christmas Eve, we were able to get this one barricaded without incident,” Hardee said. “Some policemen from the City of Notasulga helped, came over and put cars and notification there. So we were able to get barricades and things in place to help people. We greatly appreciate their assistance in that manner.”

New pipes have been ordered for the roads that remain closed, and crews worked on Lee Road 182 last week.

Lee County officials have been working with state EMA and FEMA to get a declaration for assistance, documenting damage to try to maximize potential reimbursement.

“Lee County’s damages, as our department has assessed, are over half a million dollars ourselves with these closures,” Hardee said. “The City of Auburn is reporting approximately $150,000 and the City of Opelika approximately $140,000.”

Wednesday, the Alabama Emergency Management Agency announced the state has formally requested federal disaster assistance through the Federal Emergency Management Agency. If approved, Lee County will be one of 39 counties authorized to receive help from FEMA's Public Assistance Grant Program.

"The damage caused by the tornadoes and flooding significantly impacted Alabama communities," Gov. Robert Bentley said in an Alabama EMA release. "We are working to rebuild from historic flooding, and the FEMA Public Assistance will be a tremendous help to communities. I appreciate the quick work by damage assessment teams in order for Alabama to make the request to FEMA. Together with our federal partners, we will recover from the damage."

To be included in the declaration, Lee County was required to meet the roughly $500,000 damage threshold. In addition to the county and cities' damage costs, the Loachapoka Water Authority reported more than $46,000 in damages, while the Beulah Utilities District reported nearly $5,000. Lee County's Board of Education reported $68,700 in damages, and the Auburn City Schools reported an estimated $13,000.

"I want to commend Mr. Hardee and his entire department. They handled this situation very well, as did the public works departments of both Auburn and Opelika. We've heard a lot of good things from the state EMA and the FEMA representatives that were down here about the way his staff documented all the steps along the way," Carson said.

In addition to those in his department, Hardee also commended the Lee County Sheriff's Office, which helped report and barricade dangerous roads, and volunteer firefighters, who helped cut down trees and remove them from roadways.

"We are very fortunate here to have so many entities working together to keep things safe, get things back open and assess the damage," he said.

http://www.oanow.com/news/auburn/construction-ongoing-at-auburn-s-lake-ogletree-to-replace-/article_25cb1332-fb91-11e5-806d-bf3eb66513bb.html

Construction ongoing at Auburn's Lake Ogletree to replace 75-year-old spillway

Katherine Haas | Reporter
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Concrete makes up a 75-year-old spillway that will be replaced with a new one at Auburn's main water supply, Lake

A project to build a new spillway at Auburn's Lake Ogletree aims to replace the existing dated structure while simultaneously increasing the lake's water-holding capacity.

The Water Works Board of the City of Auburn is funding a $17.5 million project to build a new spillway at Lake Ogletree — the city's main water supply — as a replacement for the existing 75-year-old spillway. The spillway is a separate structure from the dam, and controls the amount of water flowing over the dam during storm events.

"Our dam is fine, it's just that the spillway is now over 75 years old, and it's just time to be rebuilt, and in doing so, we're going to rebuild it to today's standards and also try to get a little more stored water capacity in the lake at the same time," said Auburn's Water Resource Management Director Eric Carson.

Construction on the spillway began in November 2015 and is expected to continue through January or February of 2017.

According to Carson, the board acquired Lake Ogletree from Alabama Power shortly after it was built in 1941. Over time, dam and spillway modifications have taken place — the last one having been in 2002.

"But over the years the spillway has aged, and maintenance activities have increased, and it got to a point where we decided that we better get some engineers to look at it and make sure that everything was OK or if more serious repairs were needed or what," Carson said.

An engineering study in 2008 revealed that the best course of action would be to tear down the spillway entirely and build a new one that meets modern standards. Though Carson said Alabama does not have design standards for spillways, the new one was modeled after standards in surrounding states that require them.

"The old one was showing some signs of age, and we didn't want it to potentially fail and cause problems downstream or lose Auburn's water supply," Carson said.

As a result of the project, Lake Ogletree's water level will be raised six inches, giving the city an additional 50 million gallons of stored water to be used for water treatment. Currently, the 300-acre lake holds 1.5 billion gallons of water.

A contract for the construction was awarded to ASI Constructors Inc. out of Boulder, Co., in August 2015. In February, construction crews hit a snag when they hit a void 34 feet below ground level on the upstream side of where the new spillway is being built. Teams of engineers and geologists determined that the void was created millions of years ago when two geological formations sheared past one another.

"Where Lake Ogletree is located is right at the intersection of what we call in geologic formations the coastal plain and the Piedmont," Carson explained. "Those two are different, and once you get south, you're into the coastal plain and into sandy soils, and above it you're in the red clay. It just so happens that Lake Ogletree is right on that line."

Contractors came up with a plan to fill the void with first with a layer of concrete and then concrete grout mixture to prevent it from affecting the integrity of the new spillway once it is built. The final concrete grout mixture was poured last Wednesday.

"They should be back on track with the construction of the spillway in that area in about a week or so," Carson said. "So we haven't had much of a delay, but it has caused a little delay in the project."

Carson added that the Alabama Department of Environmental Management and the Army Corps of Engineers have both assessed the project and the initiative to fill the void and determined that there is no threat to the surrounding environment or the city's water supply.

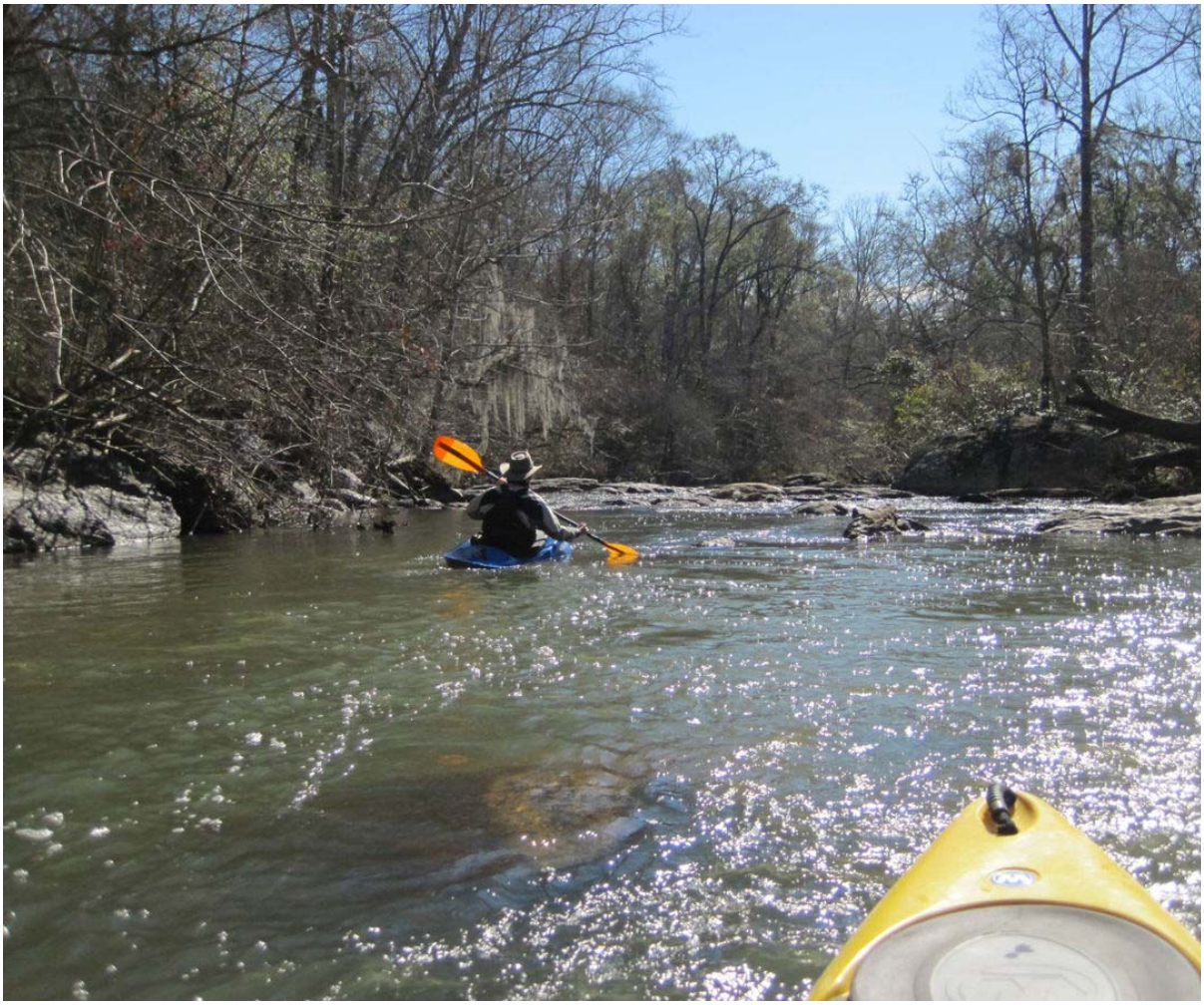
"They've come out and inspected the site, and they have not reported any violations or noted any concerns from their inspection," Carson said.

http://www.oanow.com/news/auburn/community-invited-to-clean-area-creeks-march/article_7c0d55a8-db56-11e5-a571-2301db400bfc.html

Community invited to clean area creeks March 5

Sara Falligant| Reporter
Opelika-Auburn News
sfalligant@oanow.com

Feb 24, 2016



Submitted photo

Kayakers paddle down a portion of Saugahatchee Creek.

The first Saturday in March, community members are invited to join Save Our Saugahatchee in the group's creek cleanup.

"This is an event that we do annually," said volunteer Wendy Seesock. "We have been snowed on; we have been rained on. ...We have been doing it for a very long time."

Those interested in volunteering for the cleanup should plan to meet at 8 a.m. March 5 at Covenant Presbyterian Church on Auburn's Shelton Mill Road. All volunteers are also invited to a breakfast at the church at 7:30 a.m.

"We would love everybody who comes and participates in the cleanup to join us for breakfast," Seesock said.

Save Our Saugahatchee has partnered with Keep Opelika Beautiful, which will provide bags, gloves, tools and hand sanitizer for the cleanup. All volunteers need to bring are sturdy shoes and close they don't mind getting dirty.

Volunteers will also help sort recyclable material out of the debris collected.

"We have seen the amount of material in the creek decrease since we've been doing it," Seesock said. "People thing water is a place to store waste."

And with December's record floods, volunteers expect to see even more debris in local creeks and tributaries.

"It's a little bit rugged," Seesock said. "I think it's sort of contagious."

Volunteers interested in attending the 7:30 a.m. breakfast are asked to RSVP by calling Seesock at 334-444-9911 or emailing her at seesowc@auburn.edu

Miller: Citywide Cleanup almost here

http://www.oanow.com/news/auburn-asking-citizens-to-monitor-water-usage/article_3f9e7950-97ec-11e6-9595-8b111712977b.html

Auburn drought

Auburn asking citizens to monitor water usage

Cynthia Williford | Reporter
Opelika-Auburn News
cwilliford@oanow.com
Follow on Twitter Oct 21, 2016

CYNTHIA WILLIFORD / CWILLIFORD@OANOW.COM

Pond levels at Auburn's Kiesel Park are down along with other surface water sources across the state.

The city of Auburn is asking residents to be conscious about their water usage and participate in voluntary conservation. The request comes with rainfall scarce across Alabama amid a bleak forecast for the next three months.

Auburn's Water Works Board passed a Phase I Drought Watch at its Thursday meeting, which will go into effect Monday. Lee County has been listed in the "warning" drought declaration level, and Water Resource Management Director Eric Carson said the upcoming forecast isn't showing much relief.

"The forecast is for dryer weather, so we're taking a precautionary step," Carson said. "If the forecasters are right and say we go another two months without significant rain, we want to know that we've done everything we could do to preserve what we had, cause if we didn't people would be questioning why we didn't."

Since Aug. 24, Auburn hadn't seen any significant rainfall until last weekend, Carson said.

"It had been almost two whole months without any measurable rainfall over a tenth of an inch," Carson said.

Carson said there hasn't been another time when there was two months or longer without rain, citing Auburn's rainfall records, which extend back to 1976.

Along with dry conditions, Carson said construction of a new spillway at Lake Ogletree, Auburn's main water source, also affected the board's decision to issue the watch. Though the lake's water level typically drops during warmer months, Carson said the city is pulling extra water from the lake to allow contractors to do some concrete work.

The lake sits at 486 feet above mean sea level at full pond. To prepare for construction, extra water has been pulled from the lake in order to get the water level down to 471 feet above mean sea level. Carson said they are on track to meet 471 feet soon and construction will begin at the beginning of November.

“We want to maintain the lake at 471; we don’t want it to drop down further, because that means once he’s done we’ve got to fill it up that much further,” Carson said.

The last time water levels reached 471 feet was in 2002, but Carson said winter rains brought it back up to full by the end of February or March.

“We don’t see any reason this year will be any different, except we’ve had this two months with very little rain, and the forecast is calling for dryer than normal weather in the next three months,” Carson said. “So we thought it was prudent just to go ahead and declare a stage one drought and try to get the citizens’ attention to start voluntarily restricting their water usage.”

In the last couple months, demand has increased 20 percent compared to recent years. Carson said it has all been irrigation.

Citizens are encouraged to monitor their usage during the drought watch.Though no mandatory restrictions are in place, Carson said citizens are simply asked to help preserve available resources.

David Dorton, Auburn’s director of public affairs, encouraged citizens to make sure sprinklers aren’t leaking and to limit watering lawns and plants to before 8 a.m. and after 8 p.m. Taking shorter showers, not letting the water run when brushing teeth and only running full loads of dishes or laundry could also help save water.

Carson said the department will continue to monitor the lake level weekly and will report to the board monthly to decide whether to remain in the watch or make a change.

“We’re not trying to alarm people, but it is something we have to be smart about. We want to preserve our resources, and this is one way to do it,” Carson said. “If we can get the citizens to help us out a little bit, it’ll make our job a whole lot easier.”

Cynthia Williford

http://www.oanow.com/news/auburn/spring-is-prime-time-for-kudzu-bugs/article_b18b0c38-f10f-11e5-90ff-cbaa752def65.html

Spring is prime time for kudzu bugs

Staff Reports Mar 23, 2016

Photos by Eric Day/Virginia Polytechnic Institute and State University

Kudzu bugs inhabit soybean and kudzu plants for nourishment and to lay eggs.

Residential and rural areas will soon be filled with kudzu bugs making a comeback from their overwintering sites.

Alabama Extension Entomologist Xing Ping Hu, said there are several ways for kudzu bugs to bother homeowners.

“Kudzu bugs are a nuisance that invades homes, yards and landscapes,” Hu said. “They are more problematic in later fall when they seek protected warm habitats for overwintering, often wandering into homes.”

Hu also said the bugs emit a foul smelling pheromone when disturbed. Aside from the smell, the bugs can stain fabric and skin.

Kudzu bugs may invade homes or vehicles, and may also infest tender buds and stems of plants in the back yard or garden landscape. Recent warm weather has drawn kudzu bugs out of their overwintering sites. These small, olive green, lady-bug sized bugs are sometimes mistaken for beetles, but piercing-sucking mouthparts set them apart from other pests.

As soon as weather warms, kudzu bugs migrate to trees and young plants. Satsumas, figs and other plants with new growth are appealing to kudzu bugs, but are non-host plants. These fruits and plants will serve as a temporary home for the pests until kudzu and soybean plants are available.

Kudzu bugs will lay eggs on non-host plants, but the eggs will not reach maturity. Soybean and kudzu plants are host plants, meaning kudzu bugs can lay eggs and raise offspring.

Hu said Kudzu bug maturity is dependent on temperature. In summertime temperatures, kudzu bugs can reach maturity in six weeks. During the spring maturity takes much longer.

Kudzu bugs cause plant damage by sucking phloem sap of above-ground plant parts, and feed on young and tender growths, resulting in spots, discoloration, defoliation, improperly developed pods, wilting and poor seed sets.

These pests land on anything light-colored. This includes cars, homes, clothes and people. When landing on clothes or skin, bugs can leave stains, and sometimes cause allergic reactions.

For removing kudzu bugs there is generally no reason for use of pesticides unless a large concentration of the pests is in an area where pesticide use is unlikely to cause issues.

To remove eggs and bugs from plants, it is suggested to use a high-powered hose or soapy water. Knocking infested plants with a rod to remove bugs is also an easy method of removal. Kudzu bugs play dead when bothered, so it is important to dispose of the bugs properly, either by vacuuming or by immersing them in hot soapy water.

Hu said vacuuming is the best method for removal of pests inside the home. Crushing them will leave a strong odor and may leave hard-to-remove stains. She said the bugs also play dead, so sealing kudzu bugs inside a plastic bag can help prevent a re-infestation.

To learn more about kudzu bugs and prevention or removal, contact the Coffee County Extension office at 334-894-5596 or visit aces.edu.

APPENDIX D

GREEN SPACE AND GREEN WAY MASTER PLAN

City of Auburn

Greenspace and Greenway Master Plan 2011

- Green Areas
- Parks
- Future Parks
- Streets
- Greenways
- Existing Bike Path
- Proposed Bike Path
- Major Streams and Rivers
- Minor Streams and Drainage
- Flood Plain
- Green Space
- Golf Courses
- Chewacala State Park
- City Property
- University Property

City of Auburn

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Miles

Map produced by
COA GIS Division:
9/9/2014

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APPENDIX E

2016 STORMWATER QUALITY MONITORING REPORT

City of Auburn

City of Auburn, Alabama
Phase II MS4

Annual Surface Water Quality Monitoring Report
Monitoring Period: January 1, 2016 – March 31, 2017

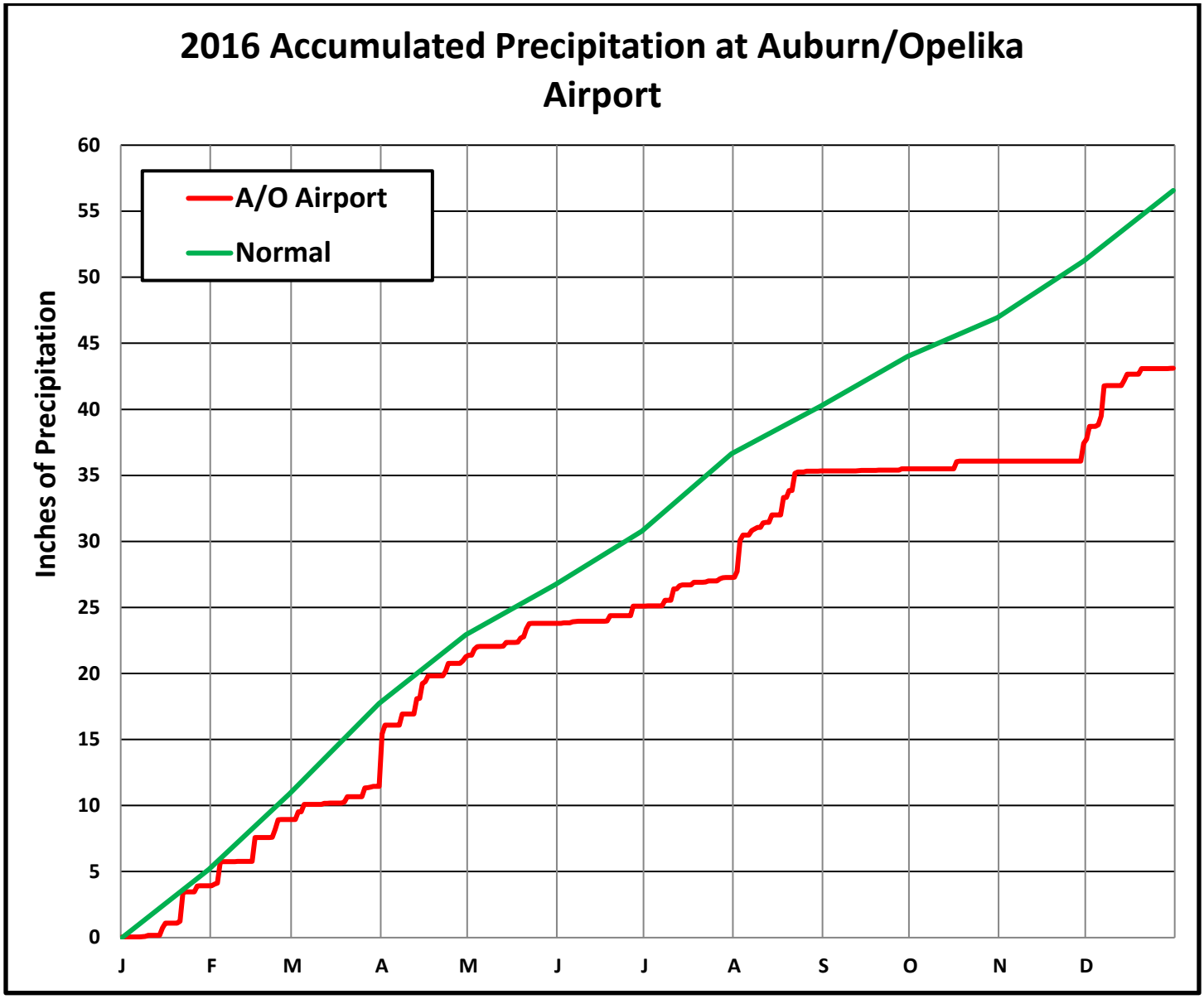
Permit # ALR040003
Effective: October 1, 2016
Expiration: September 30, 2021

Table of Contents

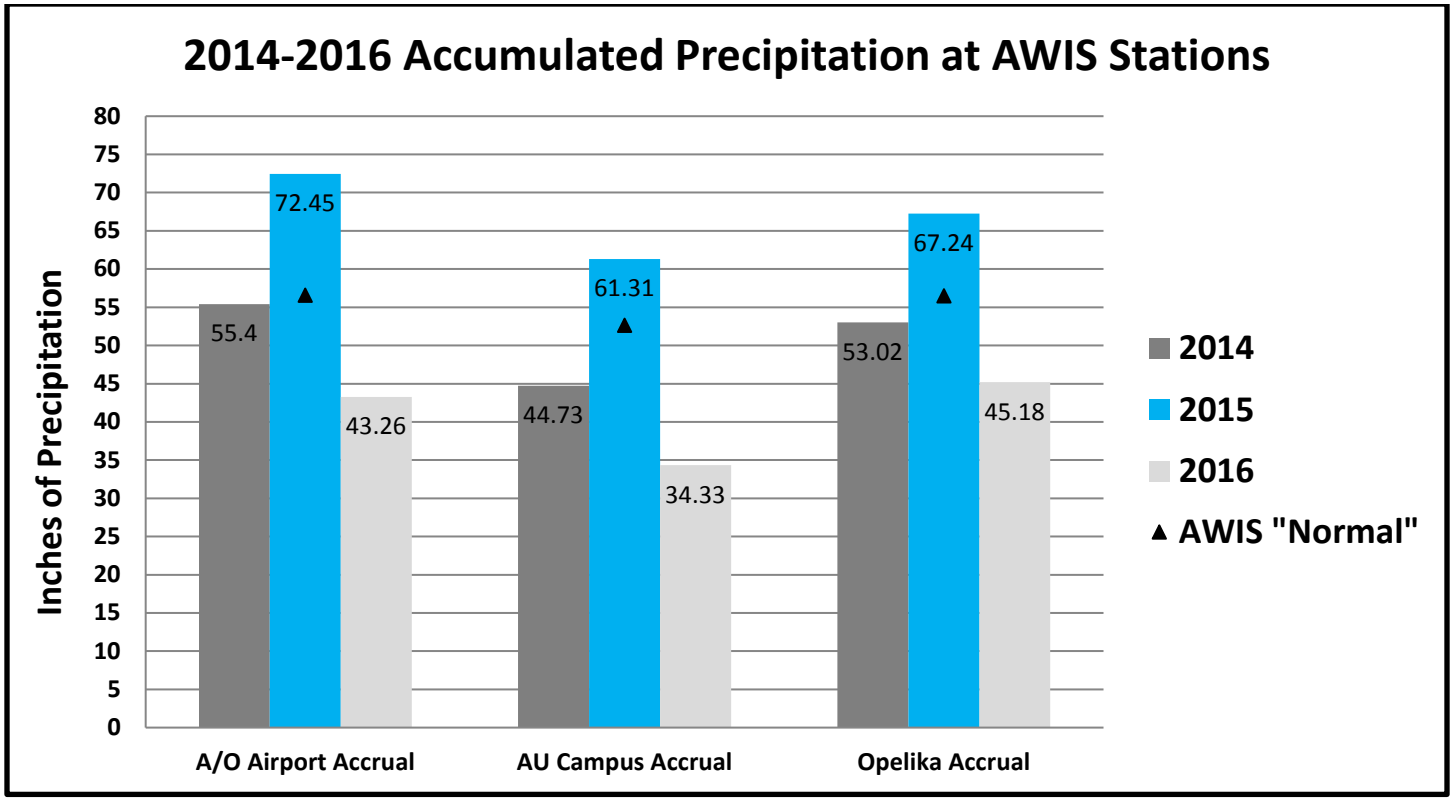
1.0 Introduction

The City of Auburn has been voluntarily collecting water quality data on its various surrounding water resources since the 1970's. Although initial efforts were primarily concentrated on source water quality monitoring in the Lake Ogletree reservoir basin of Chewacla Creek, the City's water quality monitoring has expanded to include a wide variety of monitoring programs that are used to guide its efforts of assessment, protection, and, when necessary, restoration of water quality. These programs include monitoring for physical, chemical, mineral, and biological indicators of water quality, with many monitoring efforts managed and operated in-house. This report presents the results of the water quality monitoring and analysis for the calendar year 2016 and the 1st quarter of 2017, and also includes notes and comments by Water Resource Management Staff.

1.1 Precipitation Data 2016



Monthly Accumulated Precipitation at Auburn/Opelika Airport



2014-2016 Accumulated Precipitation at AWIS Stations

2.0 Monitoring Required Under ADEM Phase II NPDES General Permit ALR040003

2.1 Purpose

The City of Auburn has three (3) streams within its jurisdiction that fail to meet the state's minimum water quality standards for their designated uses. Two streams have a finalized Total Maximum Daily Load (TMDL), and one stream is included on the 2016 final 303(d) list. A TMDL was approved for the Saugahatchee Creek watershed in 2008, with the pollutants of concern being total phosphorus (TP) and organic enrichment/dissolved oxygen (OE/DO). A TMDL was finalized for Parkerson's Mill Creek in 2011 for pathogens, with E. coli as the indicator bacteria. Moore's Mill Creek was included on the 303(d) list of impaired streams in 2000 for siltation, and there is currently no TMDL for Moore's Mill Creek. The following data were collected in the 1st quarter of 2017 in compliance with the Phase II NPDES General Permit ALR040003 as outlined in the City of Auburn's Stormwater Quality Monitoring Plan.

2.2 Results

According to ADEM Phase II NPDES General Permit ALR040003, if a waterbody within the MS4 jurisdiction is listed on the latest final 303(d) list, or otherwise designated impaired by ADEM, or for which a TMDL is approved or established by EPA, the MS4 permittee shall comply with the following:

1. Include a statement in the SWMPP stating if monitoring is required.
2. Implement a monitoring program within 6 months of permit coverage that addresses the impairment or TMDL. Include the monitoring plan in the SWMPP, and document the revisions to the monitoring plan in the SWMPP and SWMPP Annual Report.

3. Describe proposed monitoring locations and proposed monitoring frequency in the monitoring plan, with actual locations described in the SWMPP Annual Report.

4. Include in the monitoring program any parameters attributed with the latest final 303(d) list, or otherwise designated by ADEM as impaired, or are included in an EPA-approved or EPA-established TMDL.

5. Perform analysis and collection of samples in accordance with the methods specified at 40 CFR Part 136. If an approved 40 CFR Part 136 method does not exist, then an ADEM approved method may be used.

6. If samples cannot be collected due to adverse conditions, permittee must submit a description of why samples could not be collected, including available documentation of the event (e.g. weather conditions that create dangerous conditions for personnel, or impracticable conditions such as drought or ice).

7. Monitoring results must be reported with the subsequent SWMPP Annual Report and shall include the following:

    a. The date, latitude/longitude of location, and time of sampling

    b. The name(s) of the individual(s) who performed the sampling

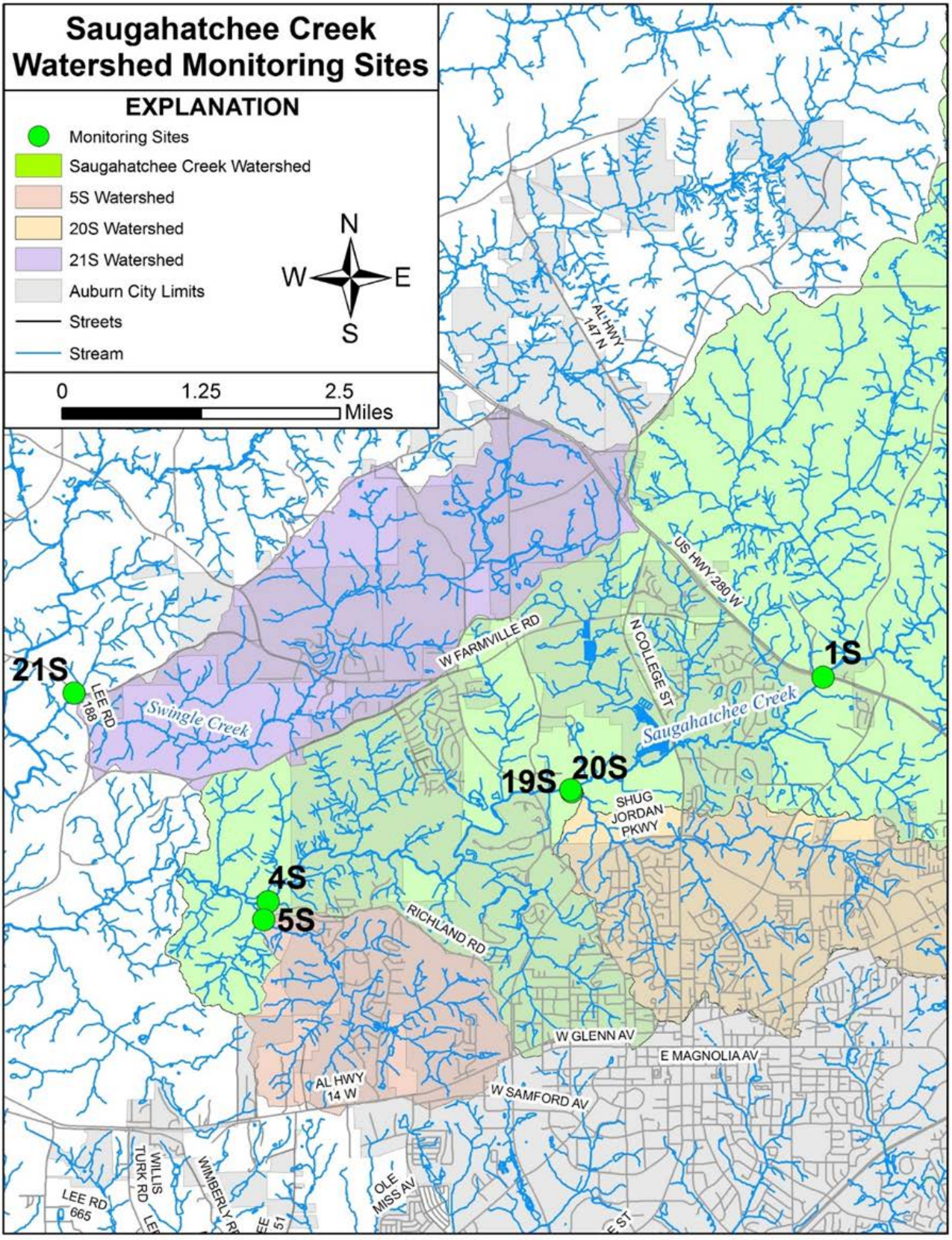
    c. The date(s) analysis were performed

    d. The name(s) of the individual(s) who performed the analysis

    e. The analytical techniques or methods used

    f. The results of such analysis

The tables that follow include the sampling and reporting requirements outlined above for Saugahatchee Creek, Parkerson's Mill Creek, and Moore's Mill Creek (watersheds that fail to meet the state's minimum water quality standards for their designated uses).



Saugahatchee Creek Watershed Monitoring Sites

Saugahatchee Creek Watershed Monitoring Data

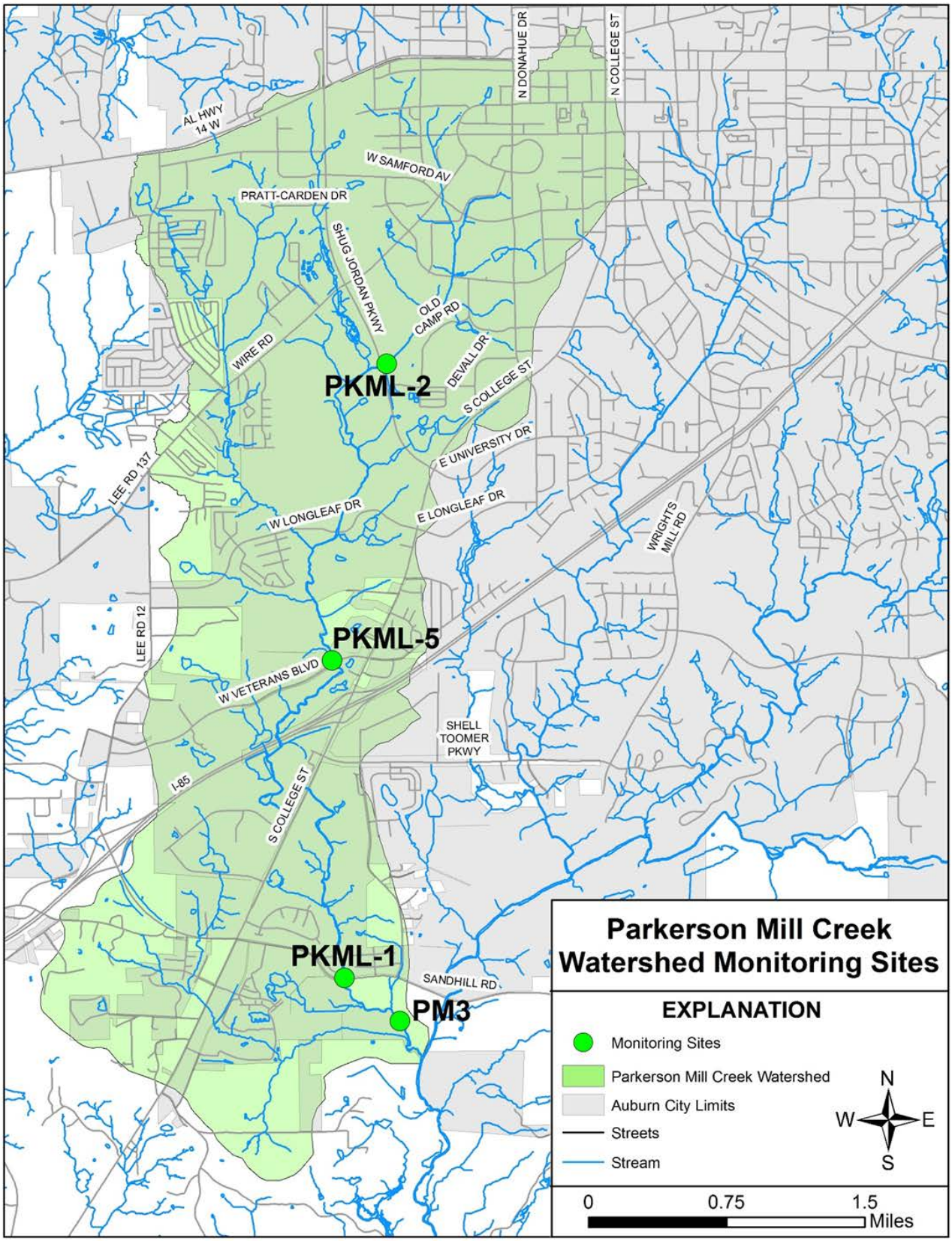
Site Number	Site Location	Site Coordinates	Streamflow (cfs)	Streamflow (MGD)
1S	Saugahatchee Creek at US HWY 280	32.657413 N, 85.459656 W	51.1	27.50
19S	Saugahatchee Creek 0.35 mi upstream of N. Donahue Dr.	32.642777 N, 85.498761 W	49.3	26.53
4S	Saugahatchee Creek at Northside WWTP	32.628185 N, 85.545705 W	49.3	26.53
5S	Unnamed Tributary to Saugahatchee Creek	32.625847 N, 85.546404 W	2.40	1.55
20S	Unnamed Tributary to Saugahatchee Creek	32.642492 N, 85.498606 W	4.04	2.61
21S	Swingle Creek above Lee Rd. 188	32.655618 N, 85.575517 W	7.01	4.53

Site Number	Sample Date	Sample Time	Sample Collected By	Total Phosphorus (mg/L)	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	0.118	EPA 365.4	3/31/2017	Christopher Ritch (ERA)
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	0.160	EPA 365.4	4/6/2017	Christopher Ritch (ERA)
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	0.150	EPA 365.4	4/6/2017	Christopher Ritch (ERA)
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	0.127	EPA 365.4	4/6/2017	Christopher Ritch (ERA)
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	<0.065	EPA 365.4	4/6/2017	Christopher Ritch (ERA)
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	0.0794	EPA 365.4	4/6/2017	Christopher Ritch (ERA)

Site Number	Sample Date	Sample Time	Sample Collected By	Water Temperature (F)	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	56.0	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	56.7	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	59.9	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	58.1	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	56.9	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	58.6	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	pH	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	7.53	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	7.21	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	7.26	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	7.04	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	7.41	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	7.31	YSI model 1001	3/21/2017	Dan Ballard, Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Dissolved Oxygen (mg/L)	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	10.33	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	9.37	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	9.40	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	9.25	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	9.93	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	10.50	YSI model 2003 polarographic	3/21/2017	Dan Ballard, Dusty Kimbrow
Site Number	Sample Date	Sample Time	Sample Collected By	Specific Conductance (uS/cm)	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	101.5	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	108.9	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	110.3	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	78.3	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	121.4	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	61.8	YSI model 5560	3/21/2017	Dan Ballard, Dusty Kimbrow
Site Number	Sample Date	Sample Time	Sample Collected By	Turbidity (NTU)	Analytical Method	Analysis Date	Analysis Performed By
1S	3/21/2017	0815	Dan Ballard, Dusty Kimbrow	7.37	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow
19S	3/21/2017	0900	Dan Ballard, Dusty Kimbrow	6.38	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow
4S	3/21/2017	1031	Dan Ballard, Dusty Kimbrow	7.81	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow
5S	3/21/2017	1000	Dan Ballard, Dusty Kimbrow	5.85	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow
20S	3/21/2017	0850	Dan Ballard, Dusty Kimbrow	4.35	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow
21S	3/21/2017	1059	Dan Ballard, Dusty Kimbrow	6.05	Standard Methods 2130 B	3/21/2017	Dan Ballard, Dusty Kimbrow



Parkerson Mill Creek Watershed Monitoring Sites

Parkerson Mill Creek Watershed Monitoring Data

Site Number	Site Location	Site Coordinates	Streamflow (cfs)	Streamflow (MGD)
PKML-1	Parkerson's Mill Creek at Sand Hill Rd	32.53744 N, 85.50601 W	2.31	1.49
PKML-2	Parkerson's Mill Creek at Shug Jordan Pkwy	32.58551 N, 85.50249 W	0.60	0.39
PKML-5	Parkerson's Mill Creek at W. Veterans Blvd	32.56243 N, 85.50716 W	2.07	1.34
PM-3	Parkerson's Mill Creek below HC Morgan WPCF	32.53427 N, 85.50156 W	10.47	6.77

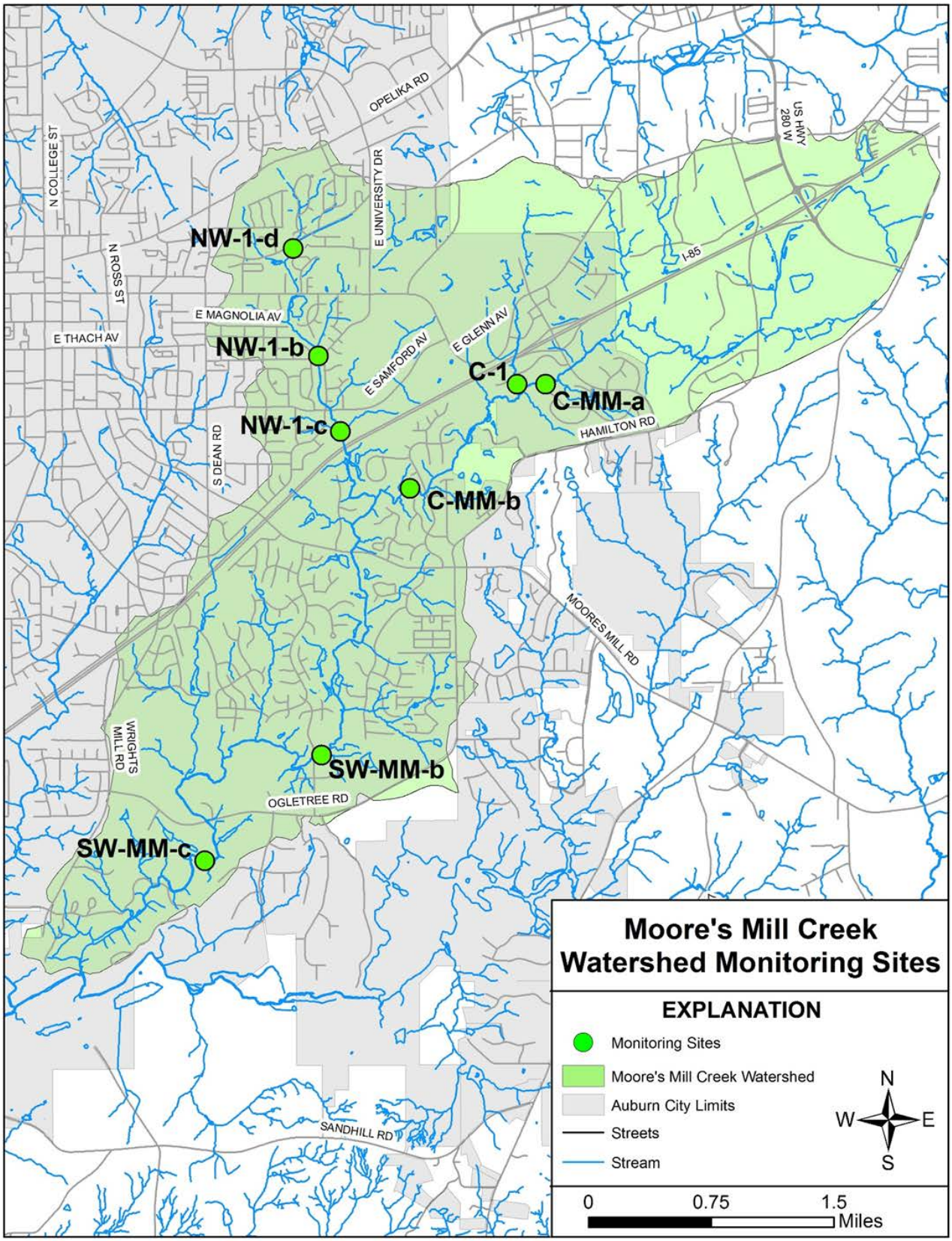
Site Number	Sample Date	Sample Time	Sample Collected By	E. coli (cfu/100mL)	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	200	Alabama Water Watch (Coliscan Easygel)	4/20/2017	Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	550	Alabama Water Watch (Coliscan Easygel)	4/20/2017	Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	100	Alabama Water Watch (Coliscan Easygel)	4/20/2017	Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	350	Alabama Water Watch (Coliscan Easygel)	4/20/2017	Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Water Temperature (F)	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	70.8	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	69.1	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	71.2	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	71.2	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	pH	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	7.98	YSI model 1001	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	7.90	YSI model 1001	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	7.65	YSI model 1001	4/18/2017	Dan Ballard, Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	7.37	YSI model 1001	4/18/2017	Dan Ballard, Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Dissolved Oxygen (mg/L)	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	9.25	YSI model 2003 polarographic	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	9.77	YSI model 2003 polarographic	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	8.50	YSI model 2003 polarographic	4/18/2017	Dan Ballard, Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	8.26	YSI model 2003 polarographic	4/18/2017	Dan Ballard, Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Specific Conductance (uS/cm)	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	204.4	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	328.0	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	211.5	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	334.2	YSI model 5560	4/18/2017	Dan Ballard, Dusty Kimbrow
Site Number	Sample Date	Sample Time	Sample Collected By	Turbidity (NTU)	Analytical Method	Analysis Date	Analysis Performed By
PKML-1	4/18/2017	1135	Dan Ballard, Dusty Kimbrow	5.81	Standard Methods 2130 B	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-2	4/18/2017	1455	Dan Ballard, Dusty Kimbrow	1.56	Standard Methods 2130 B	4/18/2017	Dan Ballard, Dusty Kimbrow
PKML-5	4/18/2017	1413	Dan Ballard, Dusty Kimbrow	4.51	Standard Methods 2130 B	4/18/2017	Dan Ballard, Dusty Kimbrow
PM-3	4/18/2017	1030	Dan Ballard, Dusty Kimbrow	2.43	Standard Methods 2130 B	4/18/2017	Dan Ballard, Dusty Kimbrow



Moore’s Mill Creek Watershed Monitoring Sites

Moore's Mill Creek Watershed Monitoring Data

Site Number	Reach Length	Upstream Coordinates	Downstream Coordinates
NW-1-b	600 ft.	32.603946 N, 85.453310 W	32.602333 N, 85.453047 W
NW-1-d	950 ft.	32.613527 N, 85.455178 W	32.611580 N, 85.456570 W
C-1	550 ft.	32.601404 N, 85.432698 W	32.600192 N, 85.432044 W
C-MM-a	950 ft.	32.600874 N, 85.428538 W	32.600530 N, 85.431463 W
NW-1-c	850 ft.	32.597506 N, 85.451326 W	32.595712 N, 85.450483 W
C-MM-b	1100 ft.	32.591034 N, 85.442119 W	32.590912 N, 85.444596 W
SW-MM-b	650 ft.	32.568631 N, 85.451830 W	32.567873 N, 85.453612 W
SW-MM-c	1350 ft.	32.559094 N, 85.463712 W	32.558760 N, 85.466685 W

Site Number	Sample Date	Sample Time	Sample Collected By	Total Suspended Solids (mg/L)	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
NW-1-d	3/23/2017	0940	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
C-1	3/23/2017	1000	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
C-MM-a	3/23/2017	1010	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
NW-1-c	3/23/2017	0910	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
C-MM-b	3/23/2017	1030	Dusty Kimbrow	5.00	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	< 2.50	Standard Methods 2540D Mod-1997	3/26/2017	Yetunde Akingbemi (ERA)

Site Number	Sample Date	Sample Time	Sample Collected By	Water Temperature (F)	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	58.3	YSI model 5560	3/23/2017	Dusty Kimbrow
NW-1-d	3/23/2017	0940	Dusty Kimbrow	59.3	YSI model 5560	3/23/2017	Dusty Kimbrow
C-1	3/23/2017	1000	Dusty Kimbrow	57.7	YSI model 5560	3/23/2017	Dusty Kimbrow
C-MM-a	3/23/2017	1010	Dusty Kimbrow	61.2	YSI model 5560	3/23/2017	Dusty Kimbrow
NW-1-c	3/23/2017	0910	Dusty Kimbrow	57.9	YSI model 5560	3/23/2017	Dusty Kimbrow
C-MM-b	3/23/2017	1030	Dusty Kimbrow	60.7	YSI model 5560	3/23/2017	Dusty Kimbrow
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	60.9	YSI model 5560	3/23/2017	Dusty Kimbrow
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	63.6	YSI model 5560	3/23/2017	Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	pH	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	7.53	YSI model 1001	3/23/2017	Dusty Kimbrow
NW-1-d	3/23/2017	0940	Dusty Kimbrow	7.27	YSI model 1001	3/23/2017	Dusty Kimbrow
C-1	3/23/2017	1000	Dusty Kimbrow	7.66	YSI model 1001	3/23/2017	Dusty Kimbrow
C-MM-a	3/23/2017	1010	Dusty Kimbrow	7.08	YSI model 1001	3/23/2017	Dusty Kimbrow
NW-1-c	3/23/2017	0910	Dusty Kimbrow	7.48	YSI model 1001	3/23/2017	Dusty Kimbrow
C-MM-b	3/23/2017	1030	Dusty Kimbrow	7.48	YSI model 1001	3/23/2017	Dusty Kimbrow
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	7.36	YSI model 1001	3/23/2017	Dusty Kimbrow
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	7.94	YSI model 1001	3/23/2017	Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Dissolved Oxygen (mg/L)	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	10.62	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
NW-1-d	3/23/2017	0940	Dusty Kimbrow	9.79	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
C-1	3/23/2017	1000	Dusty Kimbrow	10.72	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
C-MM-a	3/23/2017	1010	Dusty Kimbrow	6.91	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
NW-1-c	3/23/2017	0910	Dusty Kimbrow	9.45	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
C-MM-b	3/23/2017	1030	Dusty Kimbrow	10.31	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	9.24	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	10.13	YSI model 2003 polarographic	3/23/2017	Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Specific Conductance (uS/cm)	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	149	YSI model 5560	3/23/2017	Dusty Kimbrow
NW-1-d	3/23/2017	0940	Dusty Kimbrow	176	YSI model 5560	3/23/2017	Dusty Kimbrow
C-1	3/23/2017	1000	Dusty Kimbrow	146.2	YSI model 5560	3/23/2017	Dusty Kimbrow
C-MM-a	3/23/2017	1010	Dusty Kimbrow	124.5	YSI model 5560	3/23/2017	Dusty Kimbrow
NW-1-c	3/23/2017	0910	Dusty Kimbrow	152	YSI model 5560	3/23/2017	Dusty Kimbrow
C-MM-b	3/23/2017	1030	Dusty Kimbrow	120.5	YSI model 5560	3/23/2017	Dusty Kimbrow
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	143.0	YSI model 5560	3/23/2017	Dusty Kimbrow
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	135.4	YSI model 5560	3/23/2017	Dusty Kimbrow

Site Number	Sample Date	Sample Time	Sample Collected By	Turbidity (NTU)	Analytical Method	Analysis Date	Analysis Performed By
NW-1-b	3/23/2017	0925	Dusty Kimbrow	2.85	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
NW-1-d	3/23/2017	0940	Dusty Kimbrow	1.88	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
C-1	3/23/2017	1000	Dusty Kimbrow	2.21	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
C-MM-a	3/23/2017	1010	Dusty Kimbrow	3.86	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
NW-1-c	3/23/2017	0910	Dusty Kimbrow	2.86	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
C-MM-b	3/23/2017	1030	Dusty Kimbrow	10.2	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
SW-MM-b	3/23/2017	1100	Dusty Kimbrow	4.17	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow
SW-MM-c	3/23/2017	1120	Dusty Kimbrow	5.18	Standard Methods 2130 B	3/23/2017	Dusty Kimbrow

3.0 Water Quality at Long-term Monitoring Sites

3.1 Purpose

The 2016 monitoring year represents the eleventh full year that the City has conducted weekly turbidity measurements at 40 stations throughout its MS4 jurisdiction. Monitoring at these sites is not included in the City's Water Quality Monitoring Plan, and is not required under the Phase II NPDES General Permit ALR040003. This monitoring is conducted by the City on a strictly voluntary basis. As with previous years, data from each individual watershed is evaluated independently by monitoring station and collectively as a representative watershed group. Each station's data is also evaluated against any neighboring upstream station, thereby assisting in the identification of potential sources of sediment. Turbidity monitoring locations were strategically chosen to allow for both monitoring of the effectiveness of erosion and sediment control at construction sites and also to analyze potential trends within each watershed.

Sediment plays an important role in the biological, chemical, and physical health of streams, lakes, wetlands, and other waterbodies. However, excess siltation can cause increases in stream temperatures, decreases in the passage of light through the water column, decreased dissolved oxygen, issues with color, clogging of fish and aquatic invertebrate gills, destruction of habitat, increased nutrient loading, channel and pond aggradation, and decreased recreational use. Therefore, it is important that we understand the various sources of sediment to these ecosystems and that we monitor and control any potential sources that would otherwise exceed the natural carrying capacity of the waterbody. Therein is the primary purpose for which the City of Auburn (hereafter the City) conducts monitoring for turbidity. In addition, this monitoring provides invaluable observations of other potential water quality concerns such as illegal dumping, illicit discharge violations, unauthorized construction activity, unauthorized stream buffer encroachment, etc. These data also support and enhance the effectiveness of the City's Construction Site Erosion and Sediment Control Inspection and Enforcement Program.

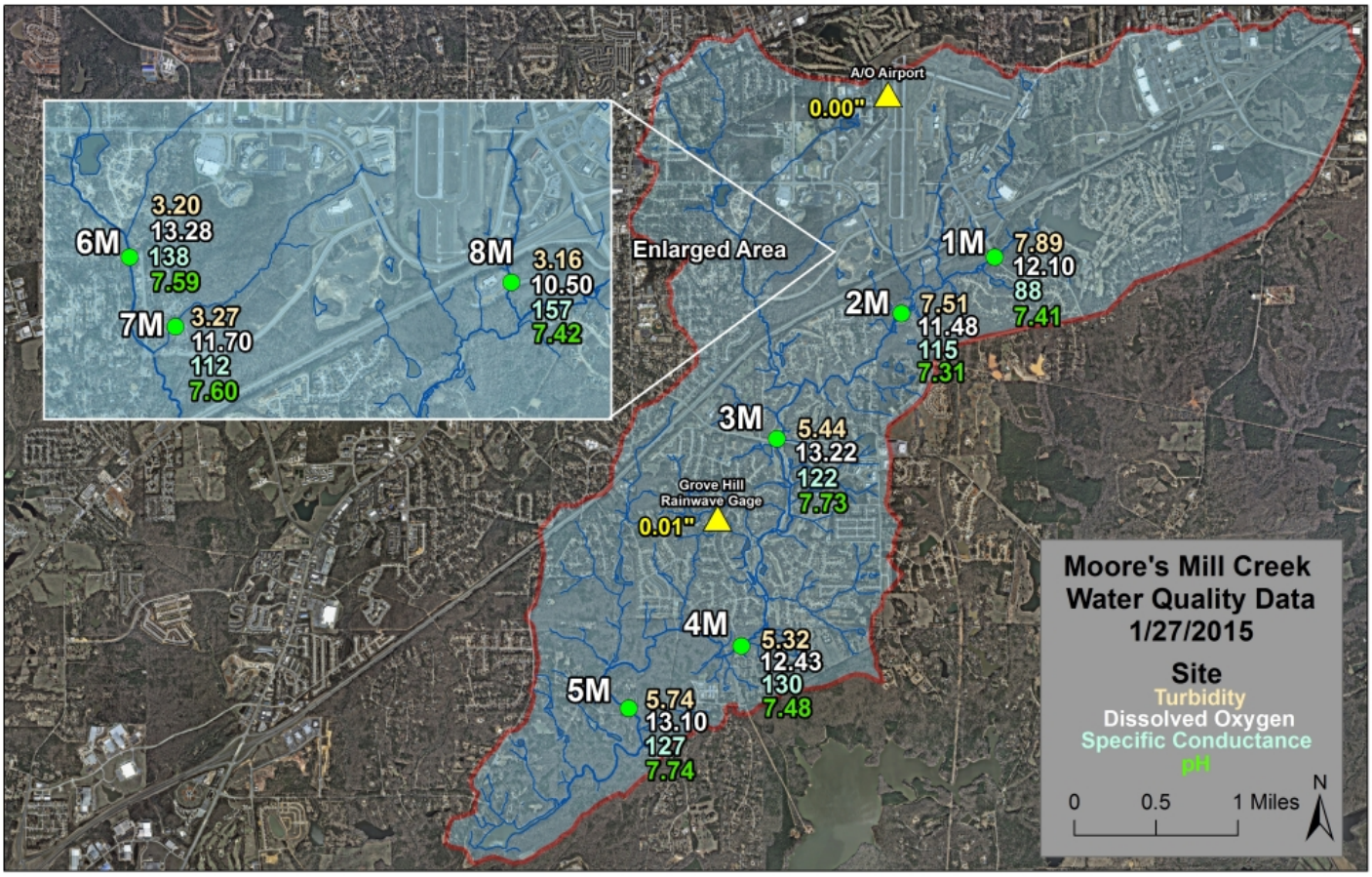
3.2 Definitions and Methods

Turbidity is the measure of the degree of transparency of a fluid as it affects the ability of light to pass through. Although it is not a direct measurement of sediment or Total Suspended Solids (TSS) within the water column, it has been identified as a useful surrogate indicator for monitoring sediment pollution in stormwater runoff from active construction sites and is often the monitoring parameter of choice for regulatory agencies. Currently, the Alabama Department of Environmental Management (ADEM) water quality criteria states that "*There shall be no turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of waters or interfere with any beneficial uses which they serve. Furthermore, in no case shall turbidity exceed 50 Nephelometric units above background*". Turbidity levels are most commonly measured using a turbidity meter which measures the amount of scattered light as it is passed through a sample at a 90° angle. The resulting numerical value is called a nephelometric turbidity unit (NTU) of which increasing values represent a decrease in light penetration through the sample. The City uses a LaMotte 2020 WE turbidimeter to measure turbidity.

The City began measuring physical and chemical parameters at each station in September 2014 using a YSI Professional Plus water quality meter http://www.ysi.com/productsdetail.php?Professional-Plus-18. These data are presented in map format on a watershed scale to staff in the Water Resource Management department. Presenting the data on a map allows Water Resource Management (WRM) staff to observe both trends and anomalies in a geospatial context. WRM staff use these data to develop water quality "signatures" for each site, dependent upon both season and antecedent precipitation. In addition to turbidity, the following parameters are collected on a weekly basis:

- Water Temperature – A measure of how hot or cool a substance is. For most designated uses, State Water Quality Criteria requires that temperature not exceed 90° Fahrenheit.
- pH – A measure of how basic or how acidic a substance is. For most designated uses, State Water Quality Criteria requires pH to be between 6.0 and 8.5.
- Dissolved Oxygen – A measure of the concentration of oxygen in its dissolved form within a substance. For most designated uses, State Water Quality Criteria requires dissolved oxygen to be a minimum of 5 mg/L except under "extreme conditions".
- Specific Conductance – A measure of a substance's ability to pass an electrical current. There are currently no State Water Quality Criteria for conductivity. Conductivity is directly correlated to the amount of dissolved ions within a substance and is a useful indicator of potential illicit discharges.

Quality control/quality assurance is an integral part of a successful water quality monitoring program. In order to develop a dependable database of water quality measurements for each sample site, WRM Staff calibrate all water quality instruments prior to field use. A detailed calibration log is filled out each time an instrument is calibrated. WRM staff also utilize field sheets to document sample site characteristics and observations such as stream color, geomorphic setting (riffle, pool, etc.), channel substrate and grain size, sample site location relative to the road crossing, sample time, and weather conditions.



Example of a Water Quality Map distributed to WRM Staff

3.3 Turbidity Summary

In general, turbidity at the majority of all stations exhibited a sustained trend of decreasing values for the ninth consecutive year. These decreases are seen in the minimum, median, average, and maximum values. No single factor can independently be attributed to these decreases. Rather, it is more than likely a combination of rainfall intensity and accumulation patterns (affecting stream flows), decreased construction activity and/or patterns of construction, increased stabilization of existing construction projects, increased professional education about erosion and sediment control, and increased erosion and sediment control inspection and enforcement that influenced this trend.

3.4 Water Quality Monitoring Sites

Chewacla Creek Watershed

Approximately 367 independent water quality measurements were collected in the Chewacla Creek watershed in 2016.

Monitoring Station Locations and Notes:

Station 1CW – Latitude *32, 35, 3.874 N*; Longitude *85, 25, 55.243 W.* Station 1CW is located along Moore's Mill Road, immediately east of the entrance to Bent Brooke Subdivision.

Station 2CW – Latitude *32, 34, 25.519 N*; Longitude *85, 25, 6.579 W.* Station 2CW is located along Moore's Mill Road, between CR 107/Estate Drive and Society Hill Road.

Station 4CW – Latitude *32, 33, 21.85 N*; Longitude *85, 24, 46.51 W.* Station 4CW is located at the crossing of CR 027 with Chewacla Creek. 4CW is a reference station used to evaluate turbidity as it enters Auburn's Phase II jurisdiction and discharges to Lake Ogletree.

Station 5CW – Latitude *32, 32, 52.236 N*; Longitude *85, 28, 1.713 W.* Station 5CW is located ½ mile downstream of the Lake Ogletree spillway and upstream of the Martin-Marietta Quarry discharge. 5CW is also a reference station monitored to evaluate turbidity within Chewacla Creek as it is discharged from Lake Ogletree, and before it leaves Auburn's Phase II jurisdiction. The relatively low values exhibited at this station can be attributed to the TSS removal provided by Lake Ogletree.

**See Insert for Maps of All Water Quality Monitoring Locations*

Turbidity (NTU)

1CW

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	9.80	3.46	5.50	6.60	6.10	5.89	5.35	8.68	11.1	10.9
MAX	320.00	650.00	290.00	110.00	220.00	300.00	59.90	176.00	142	77.7
AVG	48.69	74.92	51.93	30.55	40.41	31.27	18.82	23.67	26.17	21.34
MEDIAN	21.50	30.00	25.00	23.00	23.00	20.00	14.00	14.90	16.8	14.4

2CW

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	7.03	3.33	3.50	2.20	6.20	7.80	8.09	10.25	8.76	4.84
MAX	500.00	900.00	150.00	45.00	75.00	75.60	1145.00	3000	119	110
AVG	53.56	50.12	22.93	11.26	20.11	22.59	49.96	104.32	19.64	19.34
MEDIAN	16.00	13.00	13.00	9.45	17.00	16.50	19.80	23.4	16.39	7.02

4CW

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	4.33	4.70	3.70	3.90	4.40	2.50	3.04	2.54	3.91	5.02
MAX	400.00	1950.00	350.00	55.00	170.00	80.30	50.60	63.50	19	25.4
AVG	31.27	70.69	29.22	11.66	19.22	13.12	10.52	10.91	10.2	9.49
MEDIAN	16.50	18.00	13.00	9.50	13.50	11.00	8.03	7.36	9.09	8.1

5CW

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	1.40	0.95	1.30	1.10	1.30	0.93	0.52	0.1	1.14	1.59
MAX	55.00	33.00	95.00	23.00	19.00	8.60	28.17	57.03	9.27	27.4
AVG	7.02	4.68	8.51	4.26	3.59	3.33	5.21	6.90	3.17	7.09
MEDIAN	3.50	3.40	4.20	3.00	2.50	2.92	2.63	2.05	2.85	4.25

Water Temperature (F) | pH

1CW

	Water Temperature (F)			pH		
	2014	2015	2016	2014	2015	2016
MIN	48.3	48.4	50.0	6.64	6.61	6.77
MAX	69.7	78.4	77.0	7.6	7.7	7.95
AVG	60.2	63.5	65.0	7.28	7.07	7.39
MEDIAN	58.0	63.2	66.3	7.3	7.05	7.35

2CW

	2014	2015	2016	2014	2015	2016
MIN	45.8	44.9	49.8	6.83	6.74	6.95
MAX	69.0	77.6	77.8	7.1	7.46	7.78
AVG	59.3	61.9	65.7	7	7.03	7.33
MEDIAN	59.2	61.6	67.5	7.05	7.05	7.3

Water Temperature (F)				pH		
4CW				4CW		
	2014	2015	2016	2014	2015	2016
MIN	46.4	44.8	46.6	7.16	7.0	6.69
MAX	70.0	81	78.7	7.50	7.49	7.76
AVG	59.3	63.8	66.7	7.32	7.18	7.20
MEDIAN	56.9	65.5	69.3	7.30	7.16	7.17
5CW				5CW		
	2014	2015	2016	2014	2015	2016
MIN	51.3	50.4	51.5	7.30	7.43	7.11
MAX	72.6	84.5	82.4	7.90	8.02	8.65
AVG	62.5	67.9	67.6	7.68	7.70	7.67
MEDIAN	61.8	69.3	69.2	7.72	7.70	7.66
Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1CW				1CW		
	2014	2015	2016	2014	2015	2016
MIN	56	61	43	6.80	7.20	6.07
MAX	100	94	104	10.30	11.70	11.15
AVG	72	71	69	8.60	9.00	8.62
MEDIAN	70	67	65	8.90	8.80	8.62
2CW				2CW		
	2014	2015	2016	2014	2015	2016
MIN	54	43	29	4.00	6.20	4.66
MAX	64	68	64	9.53	11.77	10.28
AVG	60	57	52	7.21	8.57	8.23
MEDIAN	59	57	51	8.10	8.08	8.51
4CW				4CW		
	2014	2015	2016	2014	2015	2016
MIN	72	60	51	6.90	5.92	3.97
MAX	225	92	99	10.68	12.44	11.84
AVG	147	75	71	8.91	8.75	8.28
MEDIAN	135	73	65	9.25	8.08	8.61
5CW				5CW		
	2014	2015	2016	2014	2015	2016
MIN	127	78	53	6.60	6.72	5.75
MAX	164	123	185	10.00	11.52	10.95
AVG	147	100	99	8.66	8.67	8.61
MEDIAN	150	100	93	9.44	8.17	8.52

Choctafaula Creek Watershed

Approximately 300 independent water quality measurements were collected in the Choctafaula Creek watershed in 2016. Landcover within the Choctafaula Creek watershed consists of mostly forest and pasture, with relatively

little urban/suburban development. This is generally reflected in the turbidity data, as the Choctafaula stations often exhibit lower turbidity than the other streams within the City's MS4 jurisdiction. Noteworthy activity within this basin is the continued construction of the City of Auburn Technology Park West. This is an ongoing development located off Beehive Road, between Stations 1CH and 4CH. To date, there has been no recorded significant increase in turbidity downstream from the Auburn Technology Park West.

Monitoring Station Locations and Notes:

Station 1CH – Latitude *32, 34, 8.089 N*; Longitude *85, 32, 41.169 W.* Station 1CH is located on main stem Choctafaula Creek along Wire Road, immediately east of Talheim Street.

Station 2CH – Latitude *32, 34, 3.928 N*; Longitude *85, 33, 21.503 W.* Station 2CH is located on an unnamed tributary of Choctafaula Creek as it crosses under Wire Road, immediately east of CR 57. 2CH also receives flow from a mostly rural, forested basin and therefore generally exhibits low baseline and storm event turbidity values.

Station 4CH – Latitude *32, 32, 51.901 N*; Longitude *85, 33, 19.14 W.* Station 4CH is located on main stem Choctafaula Creek, as it crosses under Beehive Road, immediately west of the City of Auburn Tech Park West.

**See Insert for Maps of All Water Quality Monitoring Locations*

Statistical Analysis of Water Quality Data for the Choctafaula Creek Watershed

Turbidity (NTU)										
1CH										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.62	1.20	1.40	1.10	2.10	2.46	1.01	1.11	2.04	2.16
MAX	55.00	115.00	370.00	28.00	65.00	32.43	12.20	39.00	32.9	11.25
AVG	8.92	10.37	20.15	6.91	8.64	7.67	4.38	6.07	6.46	4.94
MEDIAN	8.10	4.23	8.50	5.10	5.45	5.60	3.90	4.63	4.12	4.2
2CH										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	1.27	1.07	1.30	0.98	1.20	0.91	0.23	0.10	0.69	1.17
MAX	240.00	110.00	350.00	24.00	130.00	88.30	11.40	111.00	108	4.86
AVG	15.02	8.61	13.92	4.44	8.48	7.95	3.46	9.28	7.95	2.94
MEDIAN	8.23	3.36	4.10	2.80	3.40	4.20	2.88	3.31	3.61	2.83
4CH										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.87	1.00	2.20	1.10	3.40	1.60	1.27	1.53	2.33	1.36
MAX	180.00	270.00	90.00	45.00	55.00	33.20	21.00	121.00	122	11.5
AVG	14.46	23.25	17.73	7.85	10.08	7.74	5.21	10.06	10.4	4.51
MEDIAN	6.18	5.00	8.50	5.50	6.40	6.09	3.79	5.24	5.04	3.71

Water Temperature (F)				pH		
1CH				1CH		
	2014	2015	2016	2014	2015	2016
MIN	41.8	43.1	52.9	7.19	7.05	6.36
MAX	80.4	79.0	80.0	7.80	7.65	7.80
AVG	65.1	63.1	68.8	7.51	7.33	7.38
MEDIAN	70	62.2	69.2	7.50	7.32	7.44
2CH				2CH		
	2014	2015	2016	2014	2015	2016
MIN	41.8	43.5	52.1	7.09	6.85	6.6
MAX	75.7	75.3	76.6	7.7	7.65	7.78
AVG	62.9	62.0	66.7	7.41	7.17	7.29
MEDIAN	68.1	62.2	67.1	7.4	7.16	7.38
4CH				4CH		
	2014	2015	2016	2014	2015	2016
MIN	42.7	45.2	51.6	7.17	6.95	6.81
MAX	78.7	77	80.6	7.6	7.57	7.73
AVG	65.3	63.3	68.8	7.4	7.3	7.41
MEDIAN	69.9	63.3	68.2	7.4	7.3	7.53
Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1CH				1CH		
	2014	2015	2016	2014	2015	2016
MIN	69	63	59	6.70	7.41	2.55
MAX	153	115	130	11.1	11.47	11.47
AVG	117	82	91	8.79	8.45	8.45
MEDIAN	125	82	86	8.4	8.87	8.87
2CH				2CH		
	2014	2015	2016	2014	2015	2016
MIN	62	53	49	6.10	6.71	1.86
MAX	81	75	84	11.0	12.85	11.47
AVG	69	64	66	8.05	9.36	7.80
MEDIAN	68	63	64	6.5	9.01	8.45
4CH				4CH		
	2014	2015	2016	2014	2015	2016
MIN	60	55	52	6.70	6.97	7.41
MAX	106	98	102	10.68	12.88	11.96
AVG	88	70	76	8.38	9.41	8.77
MEDIAN	92	67	76	7.10	8.74	8.71

Moore's Mill Creek Watershed

Approximately 799 independent water quality measurements were collected in the Moore's Mill Creek watershed in 2016.

Moore's Mill Creek remains on the ADEM list of impaired waters for siltation, with a TMDL expected to be drafted in 2017. Therefore, monitoring of turbidity in particular within Moore's Mill Creek is of critical importance in determining the potential sources of excess sediment loading and in evaluating opportunities for protection, enhancement, and restoration.

Monitoring Station Locations and Notes:

1M – Latitude *32, 36, 8.253 N*; Longitude *85, 25, 35.563 W.* Station 1M is the farthest upstream monitoring location on Moore's Mill Creek, and is located at Bent Creek Road. This station is representative of water quality as it enters the City's Phase II jurisdiction. There are currently no active construction or development activities upstream of this site within the City's MS4 jurisdiction.

2M – Latitude *32, 35, 50.808 N*; Longitude *85, 26, 9.911 W.* Station 2M is located on Moore's Mill Creek off Bonny Glen Road. 2M is downstream of the unnamed tributary that drains the Auburn University Regional Airport (AUO).

3M – Latitude *32, 35, 10.371 N*; Longitude *85, 26, 58.62 W.* Station 3M is located on Moore's Mill Creek at Moore's Mill Road.

4M – Latitude *32, 34, 4.675 N*; Longitude *85, 27, 12.574 W.* Station 4M is located on Moore's Mill Creek at Windway Road.

5M – Latitude *32, 33, 44.879 N*; Longitude *85, 27, 54.706 W.* Station 5M is the final downstream station on Moore's Mill Creek at Ogletree Road.

6M – Latitude *32, 36, 11.560 N*; Longitude *85, 27, 11.520 W.* 6M is located on an unnamed tributary to Moore's Mill Creek as it crosses under Old Mill Rd. near East University Dr.

7M – Latitude *32, 36, 0.433 N*; Longitude *85, 27, 2.378 W.* 7M is also located on an unnamed tributary to Moore's Mill Creek as it crosses under Jockish Road.

8M – Latitude 32, 36, *8.200 N*; Longitude *85, 25, 56.680 W.* 8M is located on an unnamed tributary to Moore's Mill Creek at Champions Blvd below AUO Airport.

**See Insert for Maps of All Water Quality Monitoring Locations*

Turbidity (NTU)										
1M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	2.13	1.76	2.00	1.30	2.20	0.90	1.67	0.75	1.54	1.79
MAX	1100	566.67	65.00	39.00	39.00	28.00	27.37	52.00	16.2	17.9
AVG	67.32	35.27	17.01	9.56	9.07	8.10	7.39	7.36	5.46	5.91
MEDIAN	16.00	13.00	12.00	6.20	5.80	6.85	5.27	4.15	3.74	3.79
2M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	5.70	5.23	4.70	5.20	4.60	3.00	2.79	1.76	3.75	4.1
MAX	1100	5150.00	310.00	40.00	45.00	31.00	53.00	64.00	31.1	43.7
AVG	91.56	200.40	29.51	11.79	14.00	10.51	8.80	10.24	9.03	10.95
MEDIAN	20.34	21.50	15.00	10.00	11.00	8.59	6.10	8.39	6.55	7.77
3M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	3.33	3.20	4.40	2.10	3.30	2.40	2.16	1.59	3.02	1.88
MAX	717	2200.00	250.00	70.00	50.00	57.10	30.20	84.30	48.9	76.8
AVG	55.42	82.11	30.75	10.90	11.33	11.53	6.76	10.51	9.59	13.38
MEDIAN	12.00	12.00	15.00	7.80	7.50	7.74	4.49	5.19	5.76	5.52
4M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	3.37	5.23	4.20	2.80	4.20	2.81	3.01	2.37	3.48	4.77
MAX	750	1100.00	200.00	90.00	95.00	110.00	34.80	153.00	60.9	69.2
AVG	58.31	73.42	29.02	14.33	14.66	13.69	8.19	12.80	10.7	13.35
MEDIAN	14.00	12.50	14.00	10.45	9.60	8.71	5.84	6.47	6.91	7.05
5M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	2.03	4.36	4.90	3.40	2.00	1.67	2.53	3.78	4.01	1.15
MAX	483	3200.00	320.00	170.00	85.00	50.20	31.77	205.00	68.8	42.8
AVG	57.84	92.97	34.26	14.88	15.43	11.57	8.17	14.55	11.34	9.62
MEDIAN	13.50	12.00	14.00	7.90	9.50	8.45	5.72	6.87	6.55	5.99
6M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.63	0.87	1.70	1.90	1.90	1.05	0.19	0.17	1.05	1.19
MAX	61.67	140.00	75.00	19.00	40.00	24.80	76.00	194.00	25.8	14.8
AVG	10.51	14.89	10.40	5.68	9.17	6.99	6.26	9.95	6.06	5.26
MEDIAN	6.90	6.42	6.20	4.45	5.80	5.70	3.30	3.83	3.33	4
7M										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.75	1.80	2.70	2.80	1.60	1.53	1.11	0.10	1.7	1.56
MAX	330	350.00	290.00	600.00	200.00	1225.00	147.00	293.00	194	68
AVG	39.41	42.60	34.20	35.03	23.11	53.03	9.64	12.26	20.9	13.76

8M										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	7.57	4.17	6.00	3.10	4.80	2.58	2.37	1.67	1.81	1.63
MAX	1100	4200.00	500.00	38.00	42.00	94.00	38.00	192.00	45	43.4
AVG	105.81	199.15	42.78	10.02	12.87	14.92	8.73	14.40	8.16	7.44
MEDIAN	17.50	21.00	16.00	7.00	10.00	10.12	5.58	6.33	4.5	5.06

Water Temperature (F)				pH		
1M				1M		
	2014	2015	2016	2014	2015	2016
MIN	46.6	47.8	50.3	7.20	7.15	7.04
MAX	77.1	82.9	81.9	7.50	7.48	7.54
AVG	64.8	66.9	68.3	7.36	7.35	7.32
MEDIAN	69.7	69.2	74.1	7.40	7.37	7.33
2M				2M		
	2014	2015	2016	2014	2015	2016
MIN	43.9	45.5	47.8	7.19	7.03	6.91
MAX	76.3	80.4	79.9	7.50	7.42	7.55
AVG	64.0	64.9	66.7	7.34	7.27	7.23
MEDIAN	69.8	66.8	71.2	7.30	7.25	7.20
3M				3M		
	2014	2015	2016	2014	2015	2016
MIN	49.9	47.0	44.2	7.40	7.33	7.05
MAX	79.2	85.5	86.1	7.80	8.50	8.37
AVG	65.3	66.1	67.5	7.57	7.77	7.61
MEDIAN	69.0	66.1	71.4	7.50	7.73	7.64
4M				4M		
	2014	2015	2016	2014	2015	2016
MIN	49.2	45.0	43.8	7.30	7.29	6.87
MAX	78.4	83.3	82.0	7.60	7.70	7.64
AVG	65.0	65.1	67.4	7.43	7.42	7.34
MEDIAN	67.1	64.8	70.5	7.40	7.39	7.37
5M				5M		
	2014	2015	2016	2014	2015	2016
MIN	49.0	45.6	45.1	7.30	7.15	6.95
MAX	75.3	81.3	81.2	7.90	7.98	7.86
AVG	64.0	64.8	66.5	7.58	7.62	7.45
MEDIAN	69.3	65.4	69.6	7.59	7.63	7.49
6M				6M		
	2014	2015	2016	2014	2015	2016
MIN	44.9	45.0	46.9	7.30	7.11	7.26
MAX	78.0	82.9	83.0	7.70	7.80	7.63
AVG	64.2	65.3	66.6	7.50	7.53	7.45
MEDIAN	67.6	65.6	68.0	7.51	7.53	7.46

Water Temperature (F)				pH		
7M				7M		
	2014	2015	2016	2014	2015	2016
MIN	45.0	45.1	45.9	7.33	7.19	7.17
MAX	74.5	76.6	77.6	7.70	7.74	7.64
AVG	62.7	63.0	64.5	7.53	7.53	7.44
MEDIAN	64.4	64.4	66.8	7.50	7.56	7.48
8M				8M		
	2014	2015	2016	2014	2015	2016
MIN	46.7	44.3	50.0	7.10	7.08	7.05
MAX	76.3	76.6	75.9	7.60	7.49	7.83
AVG	63.8	62.7	64.0	7.39	7.35	7.39
MEDIAN	68.2	63.0	67.3	7.35	7.34	7.36
Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1M				1M		
	2014	2015	2016	2014	2015	2016
MIN	74	67	70	4.30	5.04	4.63
MAX	222	197	227	10.23	12.56	10.98
AVG	136	109	124	7.31	8.38	7.83
MEDIAN	112	95	101	6.40	7.46	7.37
2M				2M		
	2014	2015	2016	2014	2015	2016
MIN	85	79	74	3.40	4.99	3.02
MAX	191	170	200	9.90	11.84	10.80
AVG	140	118	127	6.59	7.88	7.28
MEDIAN	133	114	112	5.50	7.26	7.55
3M				3M		
	2014	2015	2016	2014	2015	2016
MIN	82	85	77	5.50	6.80	5.94
MAX	167	168	185	11.60	13.22	12.73
AVG	130	124	128	8.65	9.86	9.47
MEDIAN	134	125	125	8.50	9.36	9.56
4M				4M		
	2014	2015	2016	2014	2015	2016
MIN	73	80	77	5.10	5.90	3.69
MAX	172	165	185	10.60	12.98	11.46
AVG	132	127	136	7.67	8.83	7.75
MEDIAN	137	130	132	6.30	8.27	7.73
5M				5M		
	2014	2015	2016	2014	2015	2016
MIN	68	78	74	6.30	7.4	5.84
MAX	171	163	163	11.60	13.35	11.92
AVG	130	125	129	8.70	9.65	8.81

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
	5M			5M		
MEDIAN	136	129	127	7.30	9.31	9.06
	6M			6M		
	2014	2015	2016	2014	2015	2016
MIN	83	83	99	6.00	7.46	5.25
MAX	148	156	140	12.10	13.90	11.95
AVG	118	134	127	8.71	9.98	9.10
MEDIAN	124	140	132	7.50	9.47	9.36
	7M			7M		
	2014	2015	2016	2014	2015	2016
MIN	91	67	104	7.10	7.36	7.10
MAX	128	177	234	11.30	12.76	11.95
AVG	102	130	151	8.84	9.60	9.02
MEDIAN	99	129	151	7.80	9.26	9.11
	8M			8M		
	2014	2015	2016	2014	2015	2016
MIN	60	95	85	6.70	7.54	7.20
MAX	196	168	177	10.60	11.58	11.65
AVG	155	146	144	8.13	9.31	9.05
MEDIAN	152	154	144	7.10	9.28	8.93

Parkerson's Mill Creek Watershed

Approximately 714 independent water quality measurements were collected in the Parkerson's Mill Creek watershed in 2016.

Monitoring Station Locations and Notes:

1P – Latitude *32, 35, 33.627 N*; Longitude *85, 29, 45.826 W.* Station 1P is the furthest upstream monitoring location on Parkerson's Mill Creek (located at the Lem Morrison Road crossing).

2P – Latitude *32, 34, 21.948 N*; Longitude *85, 30, 24.979 W.* Station 2P is located on Parkerson's Mill Creek main stem at the eastern most W. Longleaf Drive crossing.

3P – Latitude *32, 33, 44.574 N*; Longitude *85, 30, 25.114 W.* Station 3P is located on Parkerson's Mill Creek main stem at the W. Veterans Boulevard crossing.

4P – Latitude *32, 32, 13.799 N*; Longitude *85, 30, 21.591 W.* Station 4P is the furthest downstream monitoring location on Parkerson's Mill Creek main stem and is located at the CR 10/Sandhill Road crossing.

5P – Latitude *32, 35, 8.48 N*; Longitude *85, 30, 10.446 W.* Station 5P is located on Parkerson's Mill Creek main stem just downstream of Station 1P, at the Shug Jordan Parkway Crossing.

6P – Latitude *32, 35, 3.567 N*; Longitude *85, 31, 0.914 W.* Station 6P is located on an unnamed tributary near the intersection of Wire and Webster Roads.

7P – Latitude *32, 34, 22.578 N*; Longitude *85, 30, 38.989 W.* Station 7P is located downstream of Station P6 at the western most crossing on W. Longleaf Drive.

**See Insert for Maps of All Water Quality Monitoring Locations*

Statistical Analysis of Water Quality Data for the Parkerson's Mill Creek Watershed

Turbidity (NTU)										
1P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.78	0.67	1.90	1.60	2.50	0.67	0.22	0.00	0.68	0.68
MAX	153.33	550.00	450.00	90.00	230.00	70.00	14.90	38.10	28.5	13.3
AVG	21.07	41.29	38.48	9.66	27.31	12.02	4.24	5.53	5.16	4.99
MEDIAN	8.24	10.00	15.00	4.20	9.60	8.53	2.77	2.85	2.53	3.54
2P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.60	1.66	1.60	0.90	1.70	0.53	0.47	0.10	0.83	0.76
MAX	200.00	370.00	70.00	33.00	100.00	52.00	14.90	78.10	28.9	11.8
AVG	21.78	34.80	18.70	6.87	16.64	9.83	4.43	8.55	7.54	4.18
MEDIAN	7.48	8.38	12.00	5.40	6.60	6.79	2.51	4.33	3.84	3.12
3P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.30	1.70	1.10	1.20	2.00	1.17	0.69	0.12	1.32	1.31
MAX	240.00	1800.00	80.00	65.00	85.00	700.00	16.70	73.30	110	12.5
AVG	28.08	71.16	16.53	7.97	14.86	23.04	5.74	10.48	11.24	5.32
MEDIAN	8.72	7.57	9.00	4.95	7.10	7.15	3.60	4.92	4.45	3.62
4P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.78	0.46	3.10	0.85	1.50	0.73	0.30	1.00	1.53	0.97
MAX	333.33	330.00	150.00	38.00	130.00	163.00	24.20	160.00	47.4	13.2
AVG	31.63	37.58	24.02	8.68	18.11	12.59	6.55	14.96	10.41	5.38
MEDIAN		6.69	11.00	5.45	7.70	8.15	4.50	6.40	6.26	3.75
5P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.40	0.70	2.50	1.20	2.30	0.53	0.27	0.00	0.60	0.96
MAX	160.00	450.00	360.00	29.00	100.00	45.00	16.87	75.00	32.4	14.8
AVG	20.07	39.02	36.77	6.94	18.78	10.35	4.96	7.90	6.68	4.38
MEDIAN	7.40	9.55	14.00	4.60	9.00	8.89	2.53	4.32	4.29	2.87
6P										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	0.83	1.40	1.30	2.10	1.80	1.40	2.94	4.28	5.6	1.66
MAX	220.00	220.00	60.00	17.00	33.00	51.40	36.83	57.30	48.2	45.2
AVG	27.33	24.97	9.70	5.21	8.42	7.30	11.66	11.88	14.3	9.37
MEDIAN	12.00	7.13	6.20	4.80	5.60	5.40	10.93	8.13	9.7	7.10

Turbidity (NTU)										
7P										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	1.30	1.43	2.00	2.70	2.40	1.97	1.40	0.45	1.25	1.16
MAX	346.67	390.00	65.00	40.00	65.00	109.00	23.00	148.00	42.3	18.1
AVG	36.85	32.17	11.89	8.23	14.89	11.72	6.45	11.94	9.34	5.11
MEDIAN	11.00	7.57	6.30	5.80	9.25	6.64	5.40	5.58	5.06	4.05

Water Temperature (F)				pH		
1P				1P		
	2014	2015	2016	2014	2015	2016
MIN	45.2	44.1	44.3	7.04	7.17	6.45
MAX	77.7	77.5	80.4	7.70	7.66	7.77
AVG	64.6	64.3	66.6	7.37	7.43	7.29
MEDIAN	64.3	64.4	67.9	7.40	7.44	7.30
2P				2P		
	2014	2015	2016	2014	2015	2016
MIN	47.8	44.1	44.8	7.40	7.42	7.08
MAX	79.1	78.0	80.1	7.80	7.97	7.89
AVG	65.1	63.8	66.8	7.61	7.66	7.59
MEDIAN	69.7	63.9	67.8	7.60	7.67	7.64
3P				3P		
	2014	2015	2016	2014	2015	2016
MIN	46.9	44.3	44.8	7.44	7.32	7.17
MAX	77.9	80.9	82.8	7.60	7.83	7.68
AVG	64.3	64.1	66.6	7.53	7.53	7.50
MEDIAN	67.0	63.6	67.7	7.50	7.53	7.54
4P				4P		
	2014	2015	2016	2014	2015	2016
MIN	48.8	45.1	44.5	7.50	7.47	7.29
MAX	79.3	82.1	80.4	8.00	8.41	8.17
AVG	65.9	65.3	66.4	7.75	7.87	7.77
MEDIAN	70.9	65.5	66.9	7.75	7.88	7.77
5P				5P		
	2014	2015	2016	2014	2015	2016
MIN	42.7	44.2	44.5	7.30	7.28	6.88
MAX	79.7	78.5	80.4	7.70	8.00	8.19
AVG	64.5	64.4	66.4	7.48	7.62	7.49
MEDIAN	65.7	64.3	66.9	7.50	7.63	7.54

Water Temperature (F)				pH		
6P				6P		
	2014	2015	2016	2014	2015	2016
MIN	39.4	45.8	44.4	7.01	6.96	6.58
MAX	81.6	82	87.6	7.50	7.42	7.55
AVG	63.4	65.5	69.1	7.27	7.10	7.15
MEDIAN	65.6	65.3	68.6	7.25	7.08	7.20
7P				7P		
	2014	2015	2016	2014	2015	2016
MIN	47.6	45.6	45.3	7.33	7.12	7.16
MAX	77.0	78.7	79.1	7.70	7.80	7.84
AVG	64.0	63.4	65.6	7.52	7.43	7.53
MEDIAN	66.0	63.7	66.9	7.50	7.43	7.53

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1P				1P		
	2014	2015	2016	2014	2015	2016
MIN	202	107	159	5.20	6.11	3.98
MAX	402	422	454	9.74	12.98	13.04
AVG	320	305	304	7.48	8.63	8.99
MEDIAN	325	324	315	7.20	8.10	9.23
2P				2P		
	2014	2015	2016	2014	2015	2016
MIN	98	96	119	5.90	6.47	5.76
MAX	233	287	297	11.40	13.52	11.88
AVG	147	184	195	8.37	9.20	8.77
MEDIAN	136	187	187	7.30	8.90	8.87
3P				3P		
	2014	2015	2016	2014	2015	2016
MIN	85	93	110	6.10	7.18	7.08
MAX	219	262	274	11.00	13.38	12.38
AVG	150	160	174	8.29	9.52	9.35
MEDIAN	138	162	167	7.10	9.12	9.09
4P				4P		
	2014	2015	2016	2014	2015	2016
MIN	83	85	127	7.20	7.93	7.78
MAX	174	239	226	11.60	13.52	13.31
AVG	137	149	170	9.10	9.83	9.46
MEDIAN	150	156	173	7.90	9.54	9.18

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
5P				5P		
	2014	2015	2016	2014	2015	2016
MIN	113	88	142	5.30	6.34	7.06
MAX	398	441	450	11.10	13.21	13.02
AVG	254	250	271	8.15	9.12	9.17
MEDIAN	272	251	259	7.30	8.73	8.88
6P				6P		
	2014	2015	2016	2014	2015	2016
MIN	84	67	105	5.30	4.03	2.03
MAX	189	184	405	9.66	12.7	12.2
AVG	136	134	159	7.61	8.02	8.23
MEDIAN	134	138	150	7.50	7.64	8.45
7P				7P		
	2014	2015	2016	2014	2015	2016
MIN	92	88	107	6.50	7.03	5.43
MAX	142	171	177	10.80	13.08	11.89
AVG	126	135	141	8.32	9.18	8.54
MEDIAN	130	139	140	7.10	8.63	8.76

Saugahatchee Creek Watershed

Approximately 1386 independent water quality measurements were collected in the Saugahatchee Creek watershed in 2016.

Monitoring Station Locations and Notes:

1S – Latitude *32, 39, 28.708 N*; Longitude *85, 27, 33.229 W.* Station 1S is the furthest upstream monitoring location on Saugahatchee Creek main stem and is located at the US Highway 280 crossing. All construction activities contributing to this station are located outside of the City's MS4 jurisdiction.

2S – Latitude *32, 38, 54.075 N*; Longitude *85, 28, 56.552 W.* Station 2S is located on Saugahatchee Creek main stem at the N. College Street/AL 147 crossing.

3S – Latitude *32, 38, 32.179 N*; Longitude *85, 30, 14.658 W.* Station 3S is located on Saugahatchee Creek main stem at the N. Donahue Drive/CR 182 crossing.

4S - Latitude *32, 37, 40.252 N*; Longitude *85, 32, 51.6 W* Station 4S is the furthest downstream monitoring location on Saugahatchee Creek main stem and is located immediately upstream of the Northside Water Pollution Control Facility (WPCF).

5S – Latitude *32, 37, 30.273 N*; Longitude *85, 32, 45.009 W.* Station 5S is located on an unnamed tributary to Saugahatchee Creek immediately west of the Northside Water Pollution Control Facility.

6S – Latitude *32, 37, 48.368 N*; Longitude *85, 27, 7.52 W.* Station 6S is located on an unnamed tributary at the Gatewood Drive crossing near Uncle Bob's Storage.

7S – Latitude *32, 38, 10.933 N*; Longitude *85, 27, 56.368 W.* Station 7S is located downstream of 15S on an unnamed tributary to Saugahatchee Creek at the Shelton Mill Road crossing near The City Church (formerly Victory Prayer Center).

8S – Latitude *32, 37, 30.543 N*; Longitude *85, 28, 27.074 W.* Station 8S is located on an unnamed tributary to Saugahatchee Creek at the Shelton Mill Road crossing near the Covenant Presbyterian Church.

12S – Latitude *32, 38, 10.167 N*; Longitude *85, 28, 54.883 W.* Station 12S is located on an unnamed tributary to Saugahatchee Creek downstream of 8S near the intersection of N. College Street/AL 147 and Shug Jordan Parkway.

14S – Latitude *32, 39, 28.523 N*; Longitude *85, 32, 13.711 W.* Station 14S is located on W. Farmville Road on an unnamed tributary to Loblockee Creek at the discharge of the primary spillway of The Preserve pond.

15S – Latitude *32, 38, 6.51 N*; Longitude *85, 27, 34.675 W.* Station 15S is located on an unnamed tributary to Saugahatchee Creek at N. Dean Road, just downstream of 6S.

16S – Latitude *32, 38, 10.238 N*; Longitude *85, 29, 20.643 W.* Station 16S is located on the same unnamed tributary as 8S and 12S and is downstream of 12S along Shug Jordan Parkway.

17S – Latitude *32, 39, 15.106 N*; Longitude *85, 32, 1.977 W.* Station 17S is located on an unnamed tributary at the discharge of the primary spillway of the Shadow Woods pond (in Shadow Woods Subdivision off Mrs. James Road/CR 081).

18S – Latitude *32, 39, 53.844 N*; Longitude *85, 28, 51.164 W.* 18S is located on an unnamed tributary along Farmville Road, immediately downstream of Tuscany Hills.

**See Insert for Maps of All Water Quality Monitoring Locations*

Statistical Analysis of Water Quality Data for the Saugahatchee Creek Watershed

Turbidity (NTU)										
1S										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	1.00	2.66	2.46	2.20	2.40	1.25	2.16	2.03	2.42	1.35
MAX	327.67	450.00	200.00	40.00	110.00	44.70	20.57	88.50	27.2	20.4
AVG	30.55	49.54	28.28	11.22	12.69	7.42	6.71	11.44	9.95	8.87
MEDIAN	10.50	8.85	12.00	7.80	6.40	5.29	5.47	7.86	8.78	6.74
2S										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	1.53	3.26	3.23	3.30	2.70	1.40	2.59	2.51	3.35	3.22
MAX	380.00	400.00	230.00	55.00	180.00	63.30	37.10	180.00	48.9	23.1
AVG	34.83	49.72	34.85	12.69	19.09	10.53	9.28	19.00	16.04	10.58
MEDIAN	11.00	9.80	14.00	9.50	8.00	7.30	6.67	11.50	11.9	9.49

Turbidity (NTU)										
3S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.90	3.90	3.30	4.20	3.00	1.60	1.97	2.49	2.95	2.86
MAX	260.00	550.00	450.00	75.00	150.00	72.60	45.27	299.00	58.4	21.5
AVG	33.70	52.12	45.16	14.25	18.72	11.98	10.53	22.86	14.77	11.3
MEDIAN	11.00	10.50	14.00	10.25	9.10	8.65	8.40	11.85	10.72	10.0
4S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.70	3.56	2.70	3.40	2.70	1.90	1.53	1.77	3	2.76
MAX	300.00	500.00	270.00	140.00	110.00	100.40	52.80	441.00	52.4	63.8
AVG	32.25	48.54	35.53	15.76	18.84	13.54	11.31	27.21	13.25	13.7
MEDIAN	10.50	8.10	13.00	8.60	9.60	9.15	8.79	10.52	9.69	11.6
5S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	8.83	3.23	5.20	3.10	4.80	7.47	2.56	2.79	6.32	6.09
MAX	683.67	400.00	160.00	45.00	70.00	293.00	40.47	54.30	34.9	17.4
AVG	90.47	41.68	22.99	13.26	15.58	25.54	9.78	13.94	12.33	9.46
MEDIAN	**22.33**	13.50	12.00	10.60	11.00	12.00	7.34	11.00	10.58	8.37
6S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	4.27	2.03	4.20	3.40	3.40	3.20	2.17	1.09	2.41	2.74
MAX	28.67	50.00	38.00	26.00	32.00	17.60	65.00	58.40	53.8	12.1
AVG	14.01	11.07	11.07	9.44	10.58	8.71	7.41	6.50	9.13	5.52
MEDIAN	13.00	8.54	9.20	8.10	9.70	8.01	5.37	4.46	5.89	4.55
7S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	3.07	2.23	2.20	1.60	2.80	1.67	1.61	1.67	2.47	2.94
MAX	62.00	75.00	110.00	27.00	37.00	19.60	19.60	22.20	55.5	11.2
AVG	15.38	13.76	13.80	6.45	8.43	5.99	5.57	6.76	8.09	4.98
MEDIAN	10.00	7.05	8.40	5.40	6.00	5.50	4.48	5.76	4.49	4.32
8S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.33	1.83	1.70	1.40	2.30	0.80	0.89	1.00	1.18	1.41
MAX	650.00	220.00	150.00	28.00	85.00	38.20	24.57	178.00	42.2	22.4
AVG	36.90	26.99	15.50	5.49	10.64	10.76	5.47	11.46	7.48	4.64
MEDIAN	9.49	8.43	7.90	4.55	5.20	7.29	3.42	4.43	4.33	3.43
12S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.40	2.26	3.70	2.40	3.60	2.60	3.19	1.51	3.28	2.73
MAX	190.00	500.00	400.00	40.00	60.00	50.60	37.70	258.00	43	10.33
AVG	24.02	31.94	31.58	8.21	11.55	10.34	8.77	15.99	9.62	6.22
MEDIAN	14.00	7.93	13.00	6.85	7.30	7.75	6.90	7.09	6.67	5.17

Turbidity (NTU)										
14S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	3.83	4.20	3.50	3.00	5.50	3.63	1.95	0.56	4.6	4.82
MAX	996.67	950.00	55.00	85.00	65.00	50.00	32.40	55.60	48.5	32.5
AVG	82.53	64.97	14.97	15.69	19.29	16.68	7.98	13.73	13.54	10.9
MEDIAN	30.50	14.50	11.00	13.00	16.00	12.90	5.86	9.76	9.52	8.4
15S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	1.57	2.20	3.20	2.40	2.80	1.73	2.16	0.88	1.85	2.13
MAX	280.00	65.00	65.00	55.00	40.00	17.70	17.43	23.60	40.2	11.9
AVG	21.42	13.46	14.64	7.42	8.94	6.07	5.62	7.11	7.25	4.96
MEDIAN	13.00	8.57	10.00	5.50	6.30	5.35	4.32	5.69	5.1	3.94
16S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	3.20	2.60	3.70	2.20	3.80	3.94	1.44	1.38	3.18	3.08
MAX	220.00	270.00	310.00	55.00	55.00	49.30	29.13	49.50	52.9	10.7
AVG	27.07	25.86	29.79	7.99	12.09	10.61	8.20	9.73	9.39	5.66
MEDIAN	13.00	7.48	10.60	5.75	7.80	7.00	5.38	7.23	6.79	4.86
17S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	12.67	8.90	11.00	8.70	15.00	17.00	4.56	6.40	9.17	5.59
MAX	550.00	400.00	135.00	55.00	90.00	147.00	60.47	116.00	43.8	22.7
AVG	80.01	56.91	25.37	23.84	36.58	34.99	23.43	30.12	23.3	13.9
MEDIAN	47.50	25.00	21.00	21.00	29.00	29.50	20.37	23.14	21.9	12.6
18S										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
MIN	2.30	2.26	2.30	1.80	2.20	2.66	2.98	2.00	2.85	4.11
MAX	1100	360.00	200.00	29.00	33.00	30.50	57.43	42.60	41.3	11.4
AVG	56.92	30.39	16.00	5.49	6.66	6.54	8.18	7.77	9.39	6.66
MEDIAN	13.00	7.51	7.30	4.35	4.45	5.35	6.13	5.75	6.23	5.69

Water Temperature (F)				pH		
1S				**1S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	45.1	43.6	47.5	7.20	7.11	7.08
MAX	81.5	79.5	81.9	7.70	7.61	7.68
AVG	66.6	64.3	65.6	7.36	7.43	7.36
MEDIAN	68.9	64.3	65.7	7.30	7.48	7.37
2S				**2S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	45.2	43.1	46.5	6.80	6.65	6.9
MAX	80.0	79.5	83.0	7.30	7.30	7.41
AVG	63.1	64.6	65.4	7.11	7.13	7.13
MEDIAN	66.0	64.8	67.6	7.14	7.17	7.14

Water Temperature (F)				pH		
3S				3S		
	2014	2015	2016	2014	2015	2016
MIN	44.3	43.0	46.5	7.20	7.00	6.88
MAX	80.5	79.6	84.1	7.50	7.51	7.80
AVG	63.7	63.7	64.7	7.34	7.28	7.34
MEDIAN	65.0	63.7	65.6	7.30	7.29	7.30
4S				4S		
	2014	2015	2016	2014	2015	2016
MIN	45.8	42.6	47.5	7.10	7.08	6.49
MAX	84.2	85.2	84.1	7.70	7.84	7.57
AVG	66.2	64.5	66.3	7.31	7.31	7.14
MEDIAN	68.0	62.8	66.2	7.25	7.28	7.21
5S				5S		
	2014	2015	2016	2014	2015	2016
MIN	44.9	42.9	47.4	6.70	6.78	6.06
MAX	78.9	80.8	77.5	7.60	7.62	7.58
AVG	64.1	64.0	64.6	7.12	7.20	7.01
MEDIAN	65.3	64.1	66.4	7.10	7.16	7.05
6S				6S		
	2014	2015	2016	2014	2015	2016
MIN	50.7	47.9	47.4	6.70	6.40	6.6
MAX	82.4	84.1	77.5	7.30	7.24	7.56
AVG	67.2	67.0	64.6	7.04	6.90	7.04
MEDIAN	69.9	67.8	66.4	7.10	6.93	7.09
7S				7S		
	2014	2015	2016	2014	2015	2016
MIN	44.7	44.5	45.6	6.90	6.97	7.03
MAX	78.6	82.7	81.8	7.40	7.49	7.46
AVG	65.4	64.8	64.1	7.20	7.20	7.23
MEDIAN	68.9	65.0	66.6	7.20	7.16	7.21
8S				8S		
	2014	2015	2016	2014	2015	2016
MIN	48.4	42.6	47.2	7.10	6.95	6.5
MAX	78.2	77.8	78.9	7.40	7.44	7.49
AVG	65.6	64.2	63.7	7.27	7.20	7.12
MEDIAN	67.5	63.8	66.4	7.30	7.20	7.16
12S				12S		
	2014	2015	2016	2014	2015	2016
MIN	43.8	42.7	46.0	7.00	6.9	6.78
MAX	80.2	80.3	80.0	7.40	7.51	7.49
AVG	64.7	64.2	63.8	7.24	7.22	7.14
MEDIAN	67.7	63.7	66.5	7.27	7.23	7.14

Water Temperature (F)				pH		
14S				14S		
	2014	2015	2016	2014	2015	2016
MIN	47.6	45.8	47.7	6.60	6.57	6.73
MAX	87.6	87.3	89.1	7.40	7.49	7.63
AVG	67.4	68.0	67.2	6.99	7.10	7.23
MEDIAN	70.7	68.4	68.1	6.92	7.13	7.24
15S				15S		
	2014	2015	2016	2014	2015	2016
MIN	49.4	45.5	45.9	7.10	7.05	6.92
MAX	80.8	84.1	83.7	7.50	7.53	7.57
AVG	67.2	66.6	65.7	7.33	7.28	7.24
MEDIAN	70.8	67.2	68.0	7.35	7.29	7.23
16S				16S		
	2014	2015	2016	2014	2015	2016
MIN	43.6	43.0	46.5	7.10	7.1	6.64
MAX	78.9	80.9	83.5	7.40	7.5	7.47
AVG	63.6	64.8	64.7	7.29	7.25	7.18
MEDIAN	67.3	64.8	67.9	7.30	7.24	7.17
17S				17S		
	2014	2015	2016	2014	2015	2016
MIN	47.0	45.9	48.9	6.34	6.24	6.34
MAX	94.5	89.0	96.0	7.20	7.32	7.83
AVG	67.7	68.8	70.5	6.80	6.63	7.12
MEDIAN	70.1	70.4	71.4	6.80	6.55	7.09
18S				18S		
	2014	2015	2016	2014	2015	2016
MIN	45.9	43.3	48.8	6.71	6.83	6.76
MAX	76.1	75.4	75.4	7.40	7.44	7.53
AVG	64.2	62.1	62.6	7.07	7.12	7.21
MEDIAN	65.6	62.2	64.4	7.10	7.14	7.23
Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1S				1S		
	2014	2015	2016	2014	2015	2016
MIN	118	63	76	6.80	7.39	7.17
MAX	221	235	343	10.37	12.86	12.11
AVG	154	124	144	7.95	9.46	9.27
MEDIAN	154	115	115	7.30	9.07	9.47

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
2S				**2S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	115	63	77	6.10	6.36	6.29
MAX	236	246	327	10.20	12.47	10.71
AVG	155	119	141	7.53	8.65	8.26
MEDIAN	137	110	105	6.60	8.42	8.03
3S				**3S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	104	63	81	6.10	6.19	6.30
MAX	202	202	339	10.70	12.33	10.45
AVG	149	118	140	7.76	8.66	8.28
MEDIAN	145	110	117	6.60	8.54	8.49
4S				**4S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	103	65	76	6.40	6.62	6.30
MAX	175	202	241	10.40	12.62	12.88
AVG	141	119	127	7.76	8.98	8.83
MEDIAN	138	114	112	7.00	8.81	8.86
5S				**5S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	67	61	60	5.30	5.26	4.62
MAX	118	133	133	9.84	12.51	12.36
AVG	96	85	83	6.78	8.48	8.11
MEDIAN	95	79	74	5.80	7.84	8.21
6S				**6S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	70	62	88	5.30	4.18	5.30
MAX	128	158	163	9.80	10.55	10.00
AVG	109	112	122	7.28	7.54	7.16
MEDIAN	112	112	119	6.60	7.28	7.13
7S				**7S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	73	65	90	5.70	6.46	6.36
MAX	109	123	136	10.30	11.68	11.52
AVG	98	99	110	7.22	8.53	8.41
MEDIAN	102	102	108	6.30	8.13	8.36
8S				**8S**		
	2014	**2015**	**2016**	**2014**	**2015**	**2016**
MIN	80	85	84	6.50	6.72	6.52
MAX	170	181	175	10.60	12.41	13.27
AVG	140	141	141	7.97	9.03	9.25
MEDIAN	145	143	145	7.00	8.50	8.99

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
12S				12S		
	2014	2015	2016	2014	2015	2016
MIN	66	69	59	6.20	6.86	7.11
MAX	136	142	163	11.32	12.38	12.50
AVG	109	112	122	7.81	9.02	9.13
MEDIAN	115	112	124	6.80	8.80	9.13
14S				14S		
	2014	2015	2016	2014	2015	2016
MIN	69	63	67	3.30	2.40	2.70
MAX	126	157	213	10.50	12.27	10.70
AVG	92	86	105	6.99	7.54	6.75
MEDIAN	86	79	81	5.30	7.67	7.20
15S				15S		
	2014	2015	2016	2014	2015	2016
MIN	70	64	80	6.20	6.73	6.40
MAX	99	118	128	10.46	12.15	11.99
AVG	88	89	101	7.86	8.70	8.65
MEDIAN	93	92	100	6.60	8.30	8.30
16S				16S		
	2014	2015	2016	2014	2015	2016
MIN	84	64	11	6.10	6.79	6.73
MAX	130	139	158	11.26	12.08	13.25
AVG	109	111	117	8.19	8.99	9.05
MEDIAN	105	112	118	6.80	8.81	8.90
17S				17S		
	2014	2015	2016	2014	2015	2016
MIN	38	36	30	4.10	1.75	4.18
MAX	50	51	56	10.30	11.62	9.35
AVG	45	43	44	7.50	7.85	7.98
MEDIAN	46	42	43	7.60	7.91	8.11
18S				18S		
	2014	2015	2016	2014	2015	2016
MIN	76	58	42	5.60	5.84	4.75
MAX	158	100	175	8.74	11.34	10.43
AVG	103	79	88	6.44	8.20	8.01
MEDIAN	104	78	80	5.70	7.96	8.02

Town Creek Watershed

Approximately 400 independent water quality measurements were collected in the Town Creek watershed in 2016.

Monitoring Station Locations and Notes:

1T – Latitude *32, 35, 55.414 N*; Longitude *85, 28, 18.325 W*. Station 1T is located on Town Creek just upstream of the Samford Avenue crossing.
2T – Latitude *32, 35, 3.724 N*; Longitude *85, 28, 27.539 W*. Station 2T is located on Town Creek at the crossing of Gay Street.
3T – Latitude *32, 34, 46.858 N*; Longitude *85, 28, 42.094 W*. Station 3T is located on Town Creek at the crossing of East University Drive.
4T - Latitude *32, 39, 53.844 N*; Longitude *85, 28, 51.164 W*. Station 4T is located on Town Creek at the crossing of Shell-Toomer Parkway.

**See Insert for Maps of All Water Quality Monitoring Locations*

Statistical Analysis of Water Quality Data for the Town Creek Watershed

Turbidity (NTU)										
1T										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.40	0.97	0.75	1.10	1.20	0.64	0.74	0.10	0.67	0.99
MAX	55.00	65.00	33.00	31.00	35.00	22.50	27.00	596.00	59.6	11.20
AVG	9.89	8.83	7.04	4.10	5.66	4.94	3.66	23.94	6.31	2.63
MEDIAN	5.87	2.80	4.25	2.50	3.10	3.21	2.09	3.25	1.74	1.72
2T										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.52	0.95	0.65	0.82	1.30	0.73	0.25	0.10	0.96	0.91
MAX	73.33	70.00	35.00	33.00	32.00	23.30	144.00	193.00	38.3	16.9
AVG	11.27	10.00	8.13	4.52	6.30	5.41	10.68	13.05	6.39	3.75
MEDIAN	6.57	3.42	4.60	2.80	3.80	3.50	2.98	3.92	2.55	2.87
3T										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.48	0.88	1.00	0.93	1.30	1.21	0.75	1.65	1.73	2.81
MAX	66.67	65.00	58.00	48.00	41.00	21.90	18.60	153.00	30.7	94.6
AVG	11.70	10.48	10.38	5.51	8.36	5.29	5.59	10.41	7.39	12.57
MEDIAN	7.15	4.02	5.80	3.00	5.10	3.95	4.02	4.65	4.73	6.47
4T										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
MIN	0.15	0.72	2.00	0.75	1.30	0.57	0.92	0.10	0.83	0.91
MAX	70.00	80.00	55.00	45.00	39.00	32.30	27.20	77.30	32.2	89.1
AVG	11.91	11.72	10.46	5.10	7.92	6.21	5.38	7.56	5.46	7.65
MEDIAN	6.69	4.27	6.05	2.60	4.80	4.45	3.25	2.68	2.7	2.71

Water Temperature (F)				pH		
1T				1T		
	2014	2015	2016	2014	2015	2016
MIN	48.9	48.0	51.1	6.90	6.80	6.84
MAX	75.4	82.4	76.1	7.20	7.41	7.45
AVG	65.0	64.9	64.6	7.04	7.08	7.23
MEDIAN	65.9	64.8	65.5	7.01	7.07	7.25
2T				2T		
	2014	2015	2016	2014	2015	2016
MIN	42.9	42.1	44.6	7.20	7.32	7.18
MAX	77.4	80.5	79.6	7.71	7.93	7.74
AVG	63.3	63.6	64.3	7.41	7.60	7.45
MEDIAN	62.8	63.6	65.4	7.40	7.57	7.43
3T				3T		
	2014	2015	2016	2014	2015	2016
MIN	43.9	42.7	47.6	7.10	6.92	6.19
MAX	78.0	80.8	79.0	7.40	7.59	7.73
AVG	65.1	64.1	64.8	7.25	7.32	7.29
MEDIAN	66.5	63.7	65.3	7.23	7.33	7.31
4T				4T		
	2014	2015	2016	2014	2015	2016
MIN	47.1	45.1	43.9	7.30	7.03	6.75
MAX	77.9	79.3	79.7	7.83	8.05	8.09
AVG	64.2	63.7	65.4	7.65	7.67	7.56
MEDIAN	64.2	63.5	66.9	7.70	7.67	7.63
Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
1T				1T		
	2014	2015	2016	2014	2015	2016
MIN	103	100	132	5.60	5.42	6.38
MAX	170	205	189	9.62	12.37	10.45
AVG	152	168	160	7.10	8.52	8.29
MEDIAN	155	173	158	6.47	8.39	8.12
2T				2T		
	2014	2015	2016	2014	2015	2016
MIN	88	69	98	6.30	7.70	6.56
MAX	135	158	155	12.00	13.91	14.31
AVG	114	128	130	8.73	9.95	9.51
MEDIAN	120	132	131	7.50	9.75	9.37

Specific Conductance (uS/cm)				Dissolved Oxygen (mg/L)		
3T				3T		
	2014	2015	2016	2014	2015	2016
MIN	89	63	101	4.70	3.83	0.53
MAX	137	148	211	10.40	13.03	11.77
AVG	110	123	131	7.21	8.63	6.91
MEDIAN	112	126	127	6.35	8.20	7.56
4T				4T		
	2014	2015	2016	2014	2015	2016
MIN	82	70	54	6.80	7.86	4.84
MAX	130	144	179	11.40	13.41	11.97
AVG	107	120	125	8.80	9.88	8.97
MEDIAN	104	128	123	7.30	9.30	8.91

4.0 Multi-parameter Monitoring

4.1 Purpose

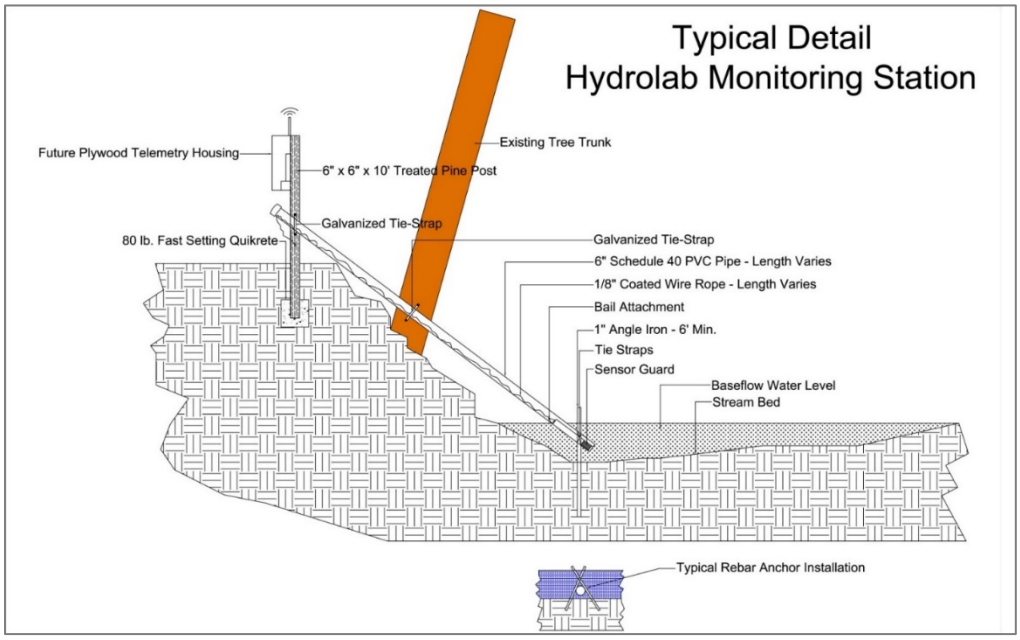
There is no single water quality parameter available to determine the health of a waterbody. Rather, the overall health of aquatic ecosystems is determined by a wide range of biological, chemical, physiochemical, and physical characteristics. Furthermore, these characteristics often vary from region-to-region, stream-to-stream, season-to-season, and day-to-day (diurnal patterns). Therefore, the City has committed itself to trying to better understand each of its major receiving waters by monitoring year-round. Monitoring throughout the year is performed to determine if the various waterbodies are attaining State Water Quality across multiple parameters and to determine if, when, and where causes for concern may exist. The water quality sondes utilized in this multi-parameter monitoring may also be operated as secondary devices for detection and tracing of illicit discharges.

4.2 Definition and Methods

The Water Resource Management Department is equipped with two Hach Hydrolab DS5 Multi-parameter Water Quality Sondes (Hydrolab). These Hydrolab units allow for the monitoring of multiple water quality parameters and are capable of being launched unattended for extended periods of time to conduct linear, in-situ sampling. In years past, both sondes were launched simultaneously at an upstream and downstream location within the City's Phase II jurisdictional territory for a period of 72 hours and with a logging interval of one reading per 20 minutes (equal to 72 readings per 24 hours). However, in 2012 the Water Resource Management Department constructed 10 permanent stations for which to perform long-term deployment of the Hydrolabs, starting with Parkerson's Mill Creek. Each deployment will last one calendar year, for which the monitoring of Parkerson's Mill was performed between July 27, 2012 and July 18, 2012 and the monitoring of Saugahatchee Creek began on August 1, 2013. The Hydrolabs were moved to Moore's Mill Creek beginning August 13, 2014. Monitoring of Town Creek began in December of 2015, but the sondes were removed in April of 2016 due to sensor malfunction. Each sonde is cleaned and data downloaded once per week and is shipped to the manufacturer once per quarter for performance testing, evaluation, and calibration. Parameters that the Hydrolab measures and records are temperature, pH, turbidity, dissolved oxygen, conductivity, salinity, oxidation-reduction potential, total dissolved solids, and resistance. The sondes will analyze these water quality parameters at an interval of 15 minutes/logging for one full year. Each individual probe uses EPA approved methods for analysis of each parameter. Analyzing each parameter individually and collectively over extended periods of time allows for a holistic analysis of water quality. These parameters are defined as:

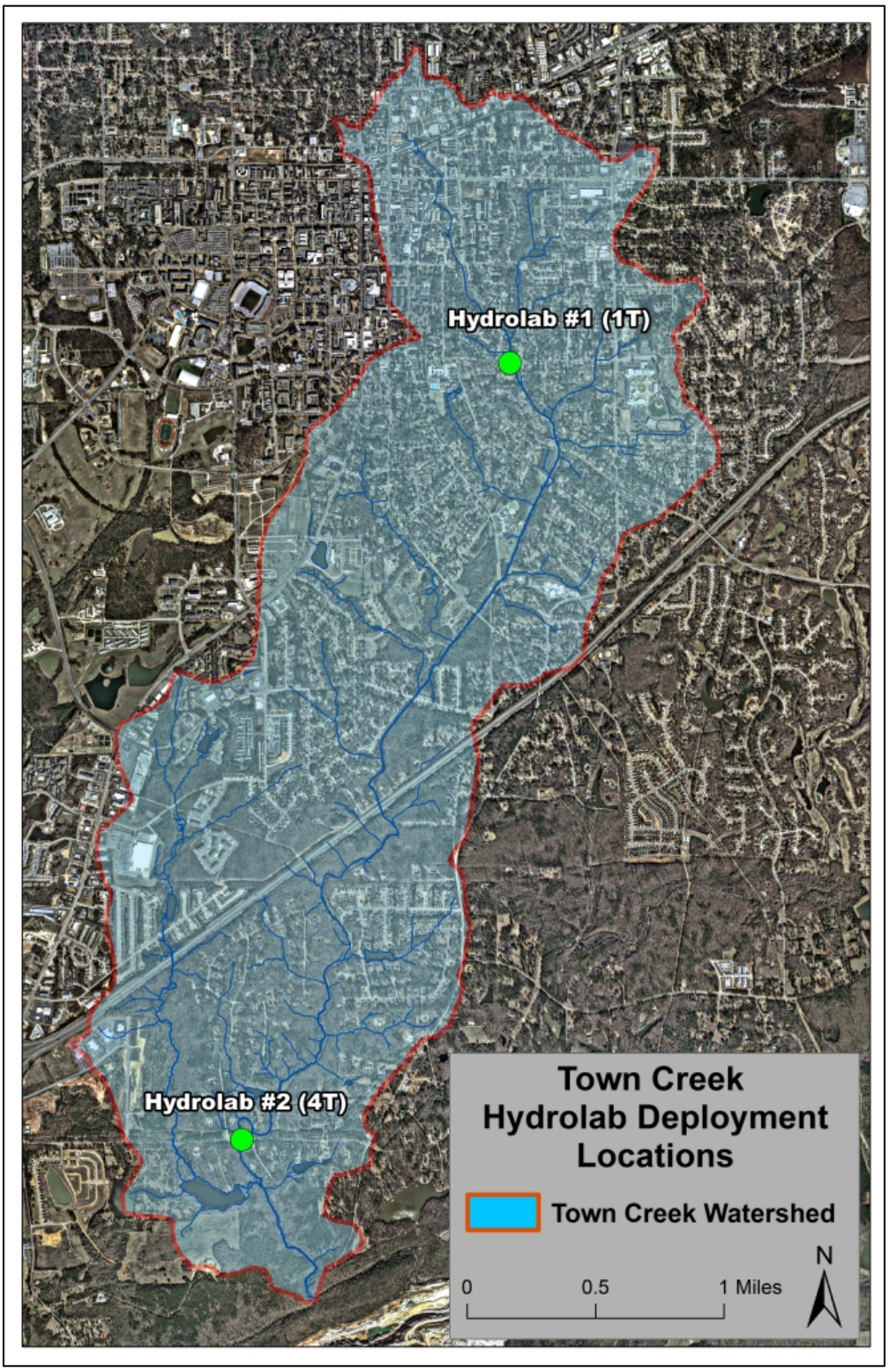
- Temperature – A measure of how hot or cool a substance is. For most designated uses, State Water Quality Criteria requires that temperature not exceed 90° Fahrenheit.
- pH – A measure of how basic or how acidic a substance is. For most designated uses, State Water Quality Criteria requires pH to be between 6.0 and 8.5.
- Turbidity – A measure of the degree of transparency of a fluid as it affects the ability of light to pass through.
- Dissolved Oxygen – A measure of the concentration of oxygen in its dissolved form within a substance. For most designated uses, State Water Quality Criteria requires dissolved oxygen to be a minimum of 5 mg/L except under "extreme conditions".
- Conductivity – A measure of a substance's ability to pass an electrical current. There are currently no State Water Quality Criteria for conductivity. Conductivity is directly correlated to the amount of dissolved ions within a substance and is a useful indicator of potential illicit discharges.

*Information regarding individual sensor range, accuracy, and resolution and analytical method can be found at http://www.hydrolab.com/web/ott_hach.nsf/id/pa_datasonde_5.html.

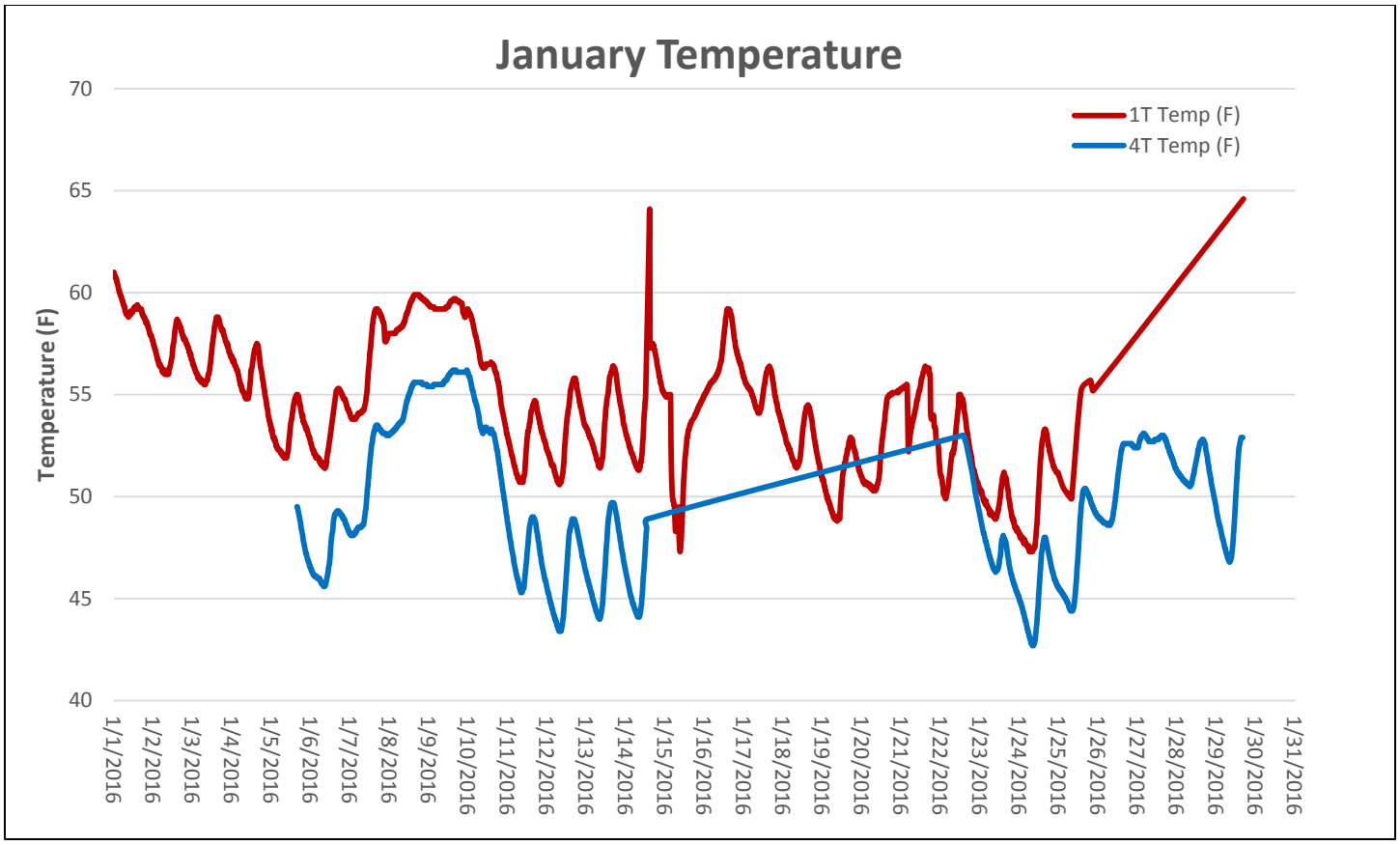


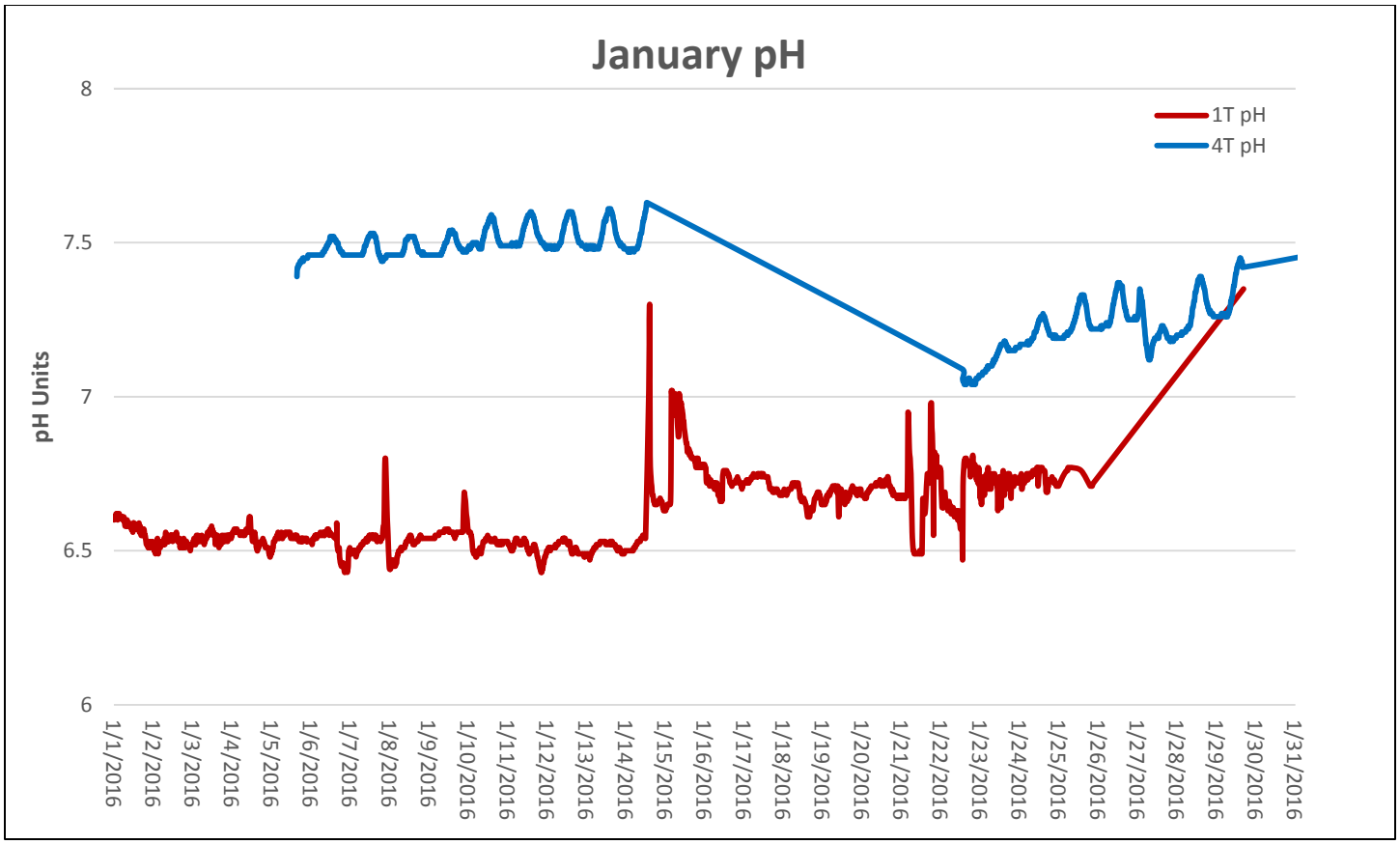
4.3 Multi-parameter Monitoring Data

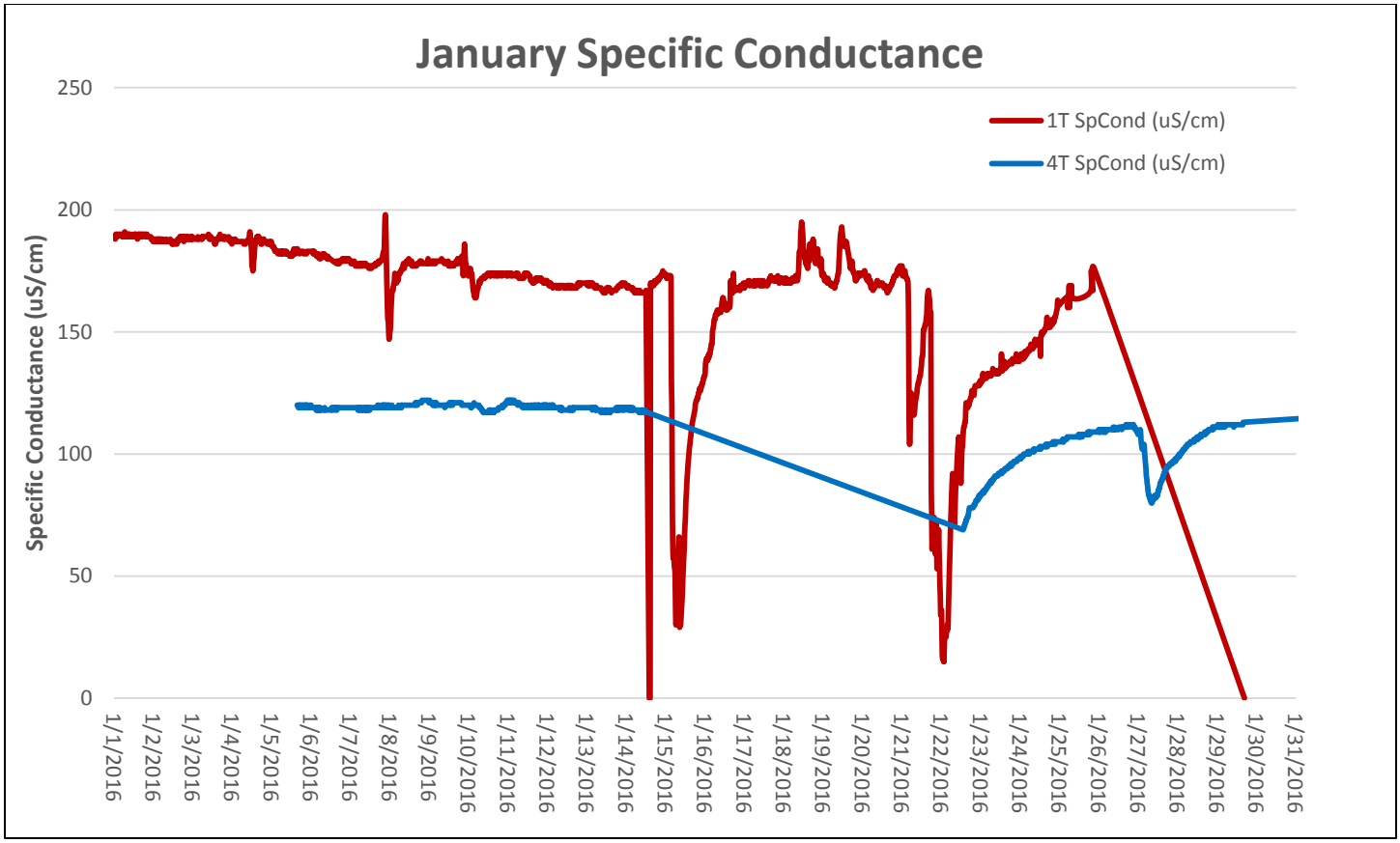
Multi-parameter monitoring began on Town Creek on December 15, 2015, and continued to April 12, 2016. Below is a map of the Hydrolab locations on Town Creek. Monthly data collected during this extended deployment are graphed below. Site number 1T refers to Hydrolab #1, and site number 4T refers to Hydrolab #2.

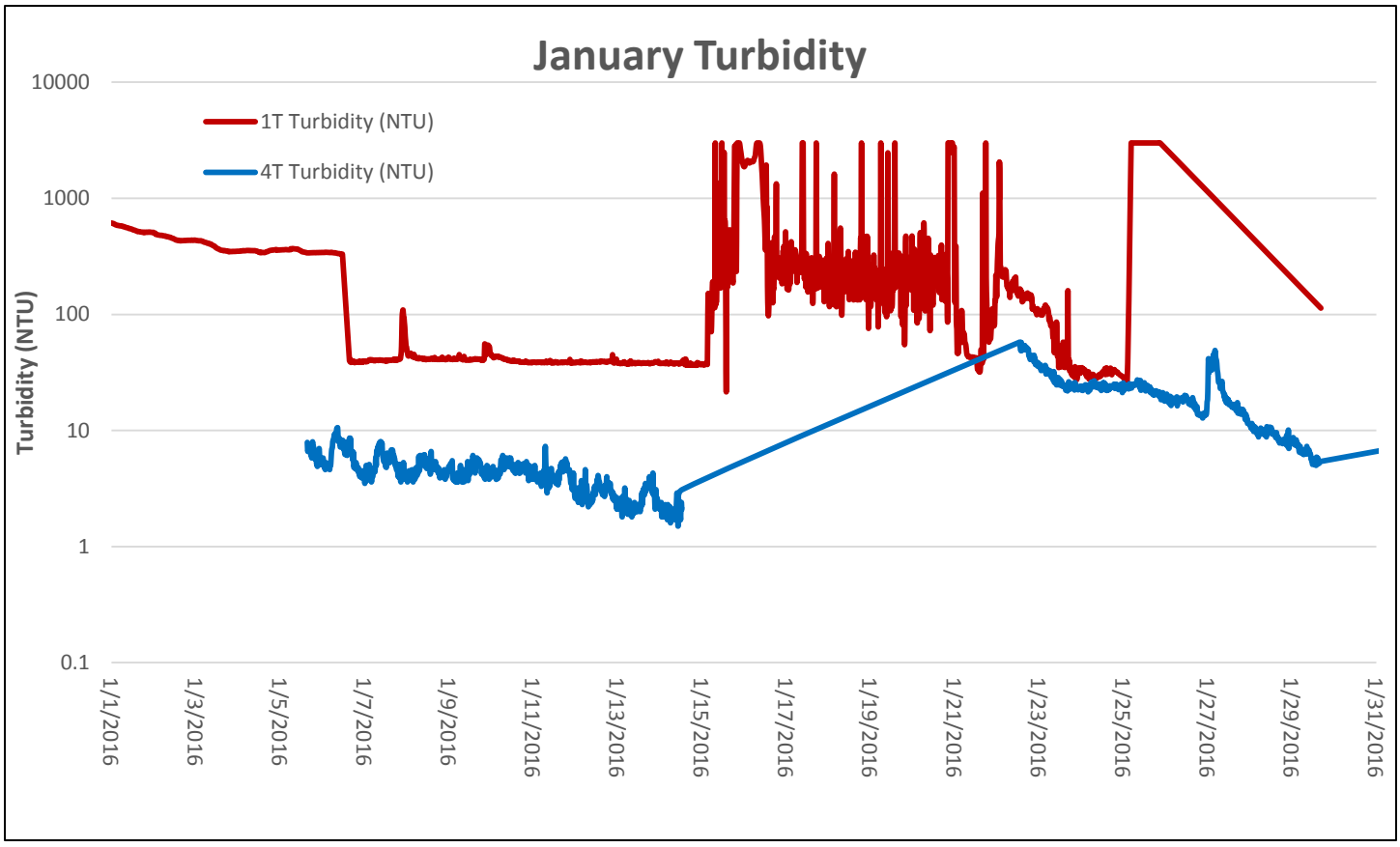


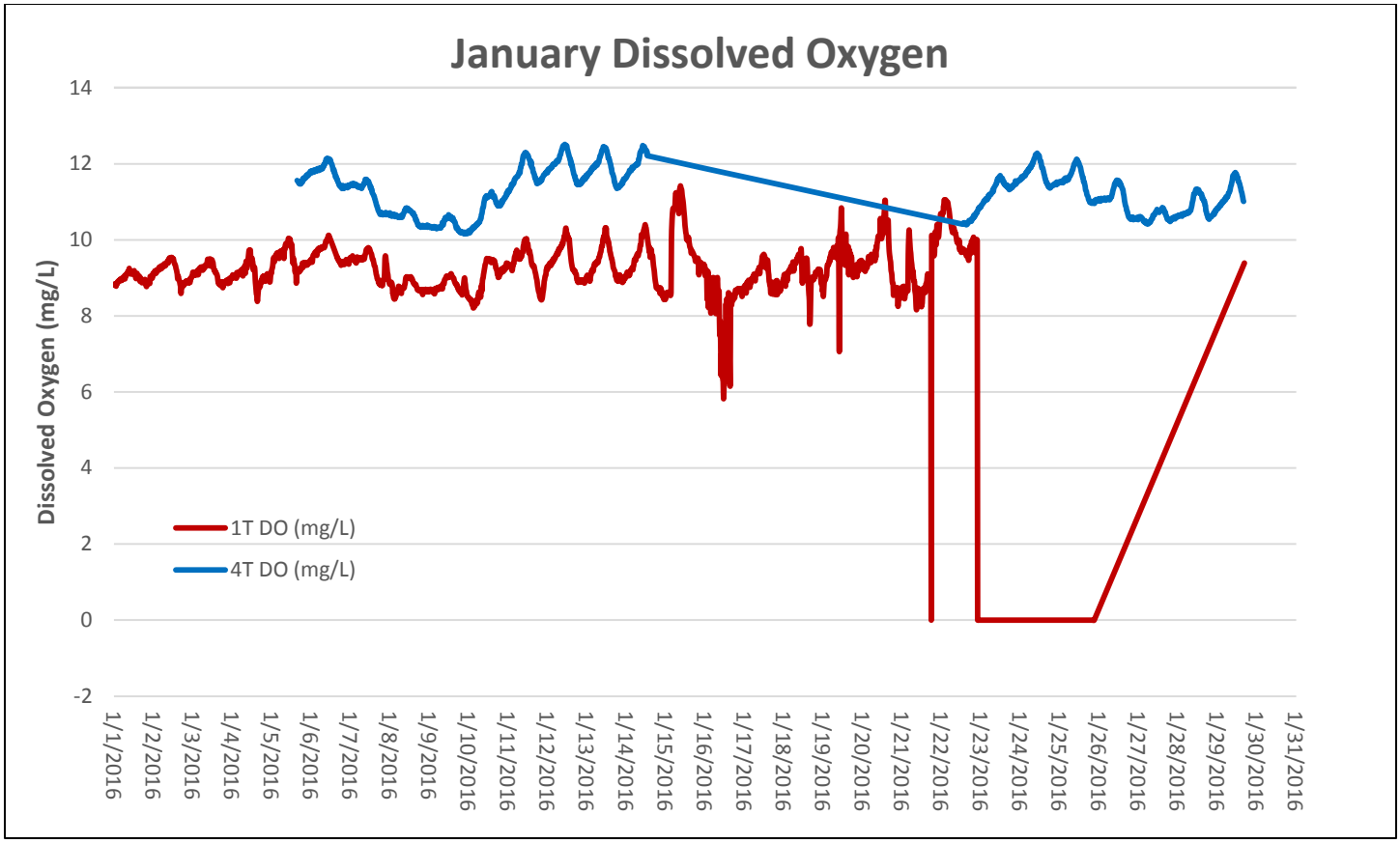
January 2016



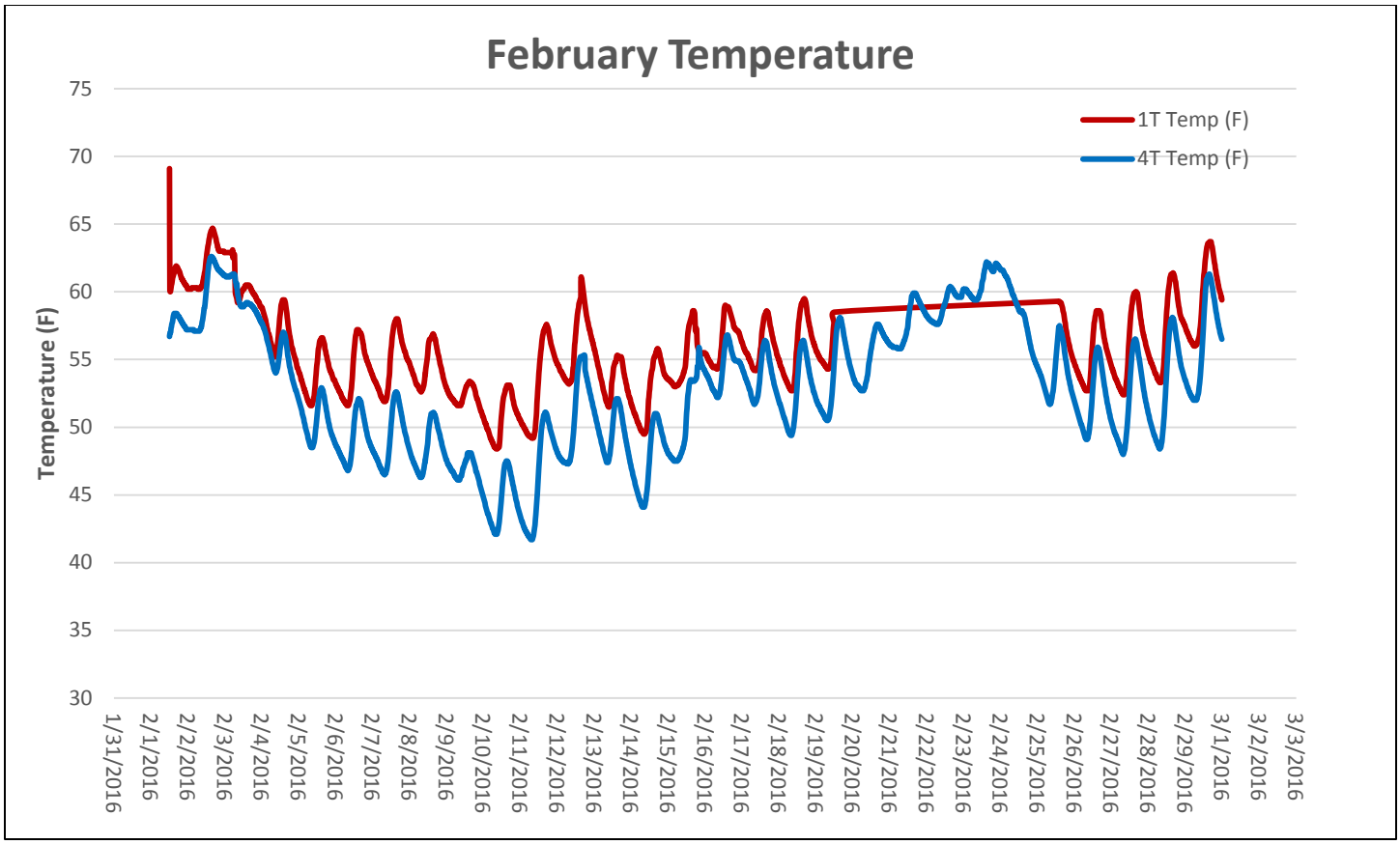


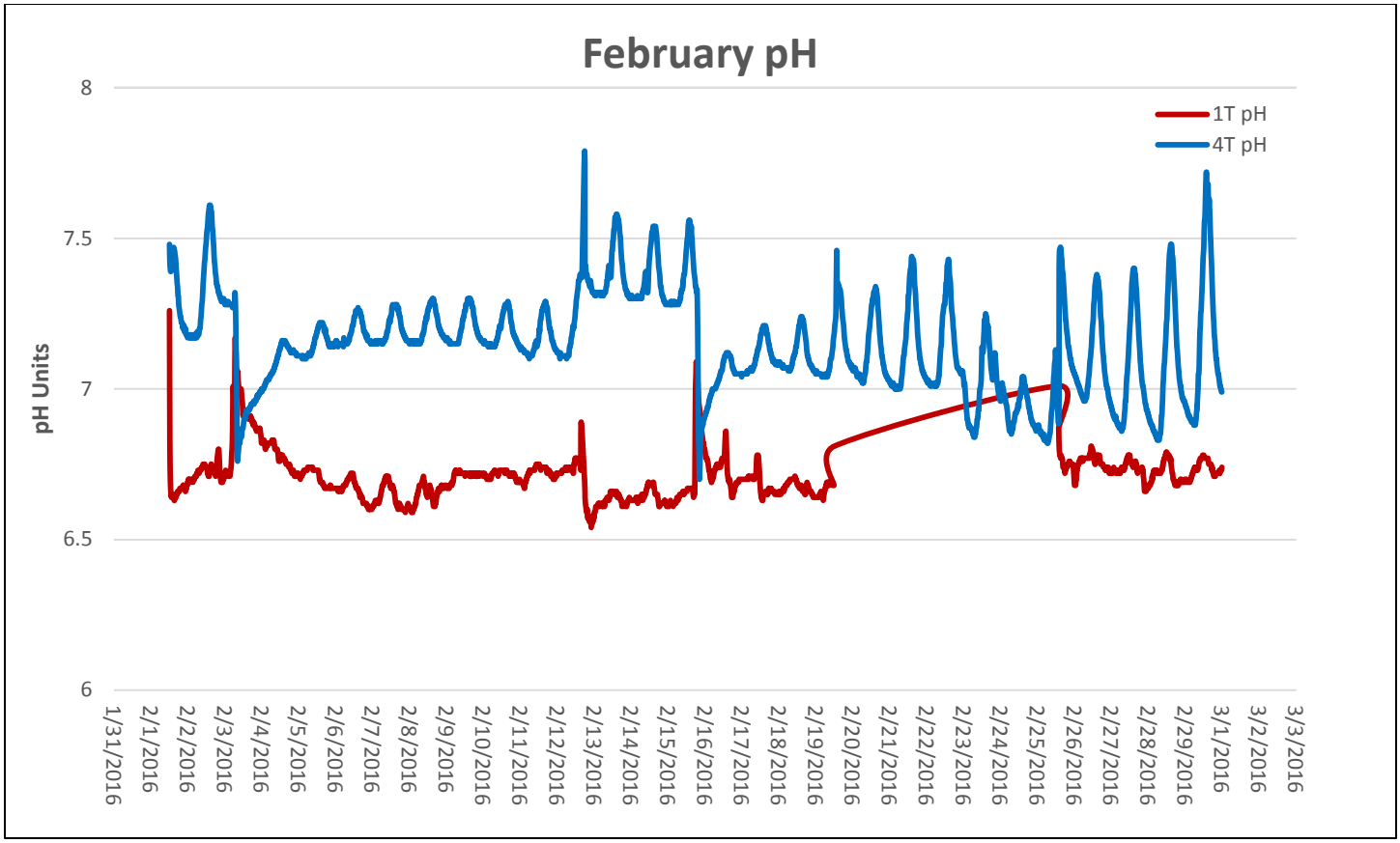

January Specific Conductance
Specific Conductance (uS/cm)
250
200
150
100
50
0
1T SpCond (uS/cm)
4T SpCond (uS/cm)
1/1/2016
1/2/2016
1/3/2016
1/4/2016
1/5/2016
1/6/2016
1/7/2016
1/8/2016
1/9/2016
1/10/2016
1/11/2016
1/12/2016
1/13/2016
1/14/2016
1/15/2016
1/16/2016
1/17/2016
1/18/2016
1/19/2016
1/20/2016
1/21/2016
1/22/2016
1/23/2016
1/24/2016
1/25/2016
1/26/2016
1/27/2016
1/28/2016
1/29/2016
1/30/2016
1/31/2016

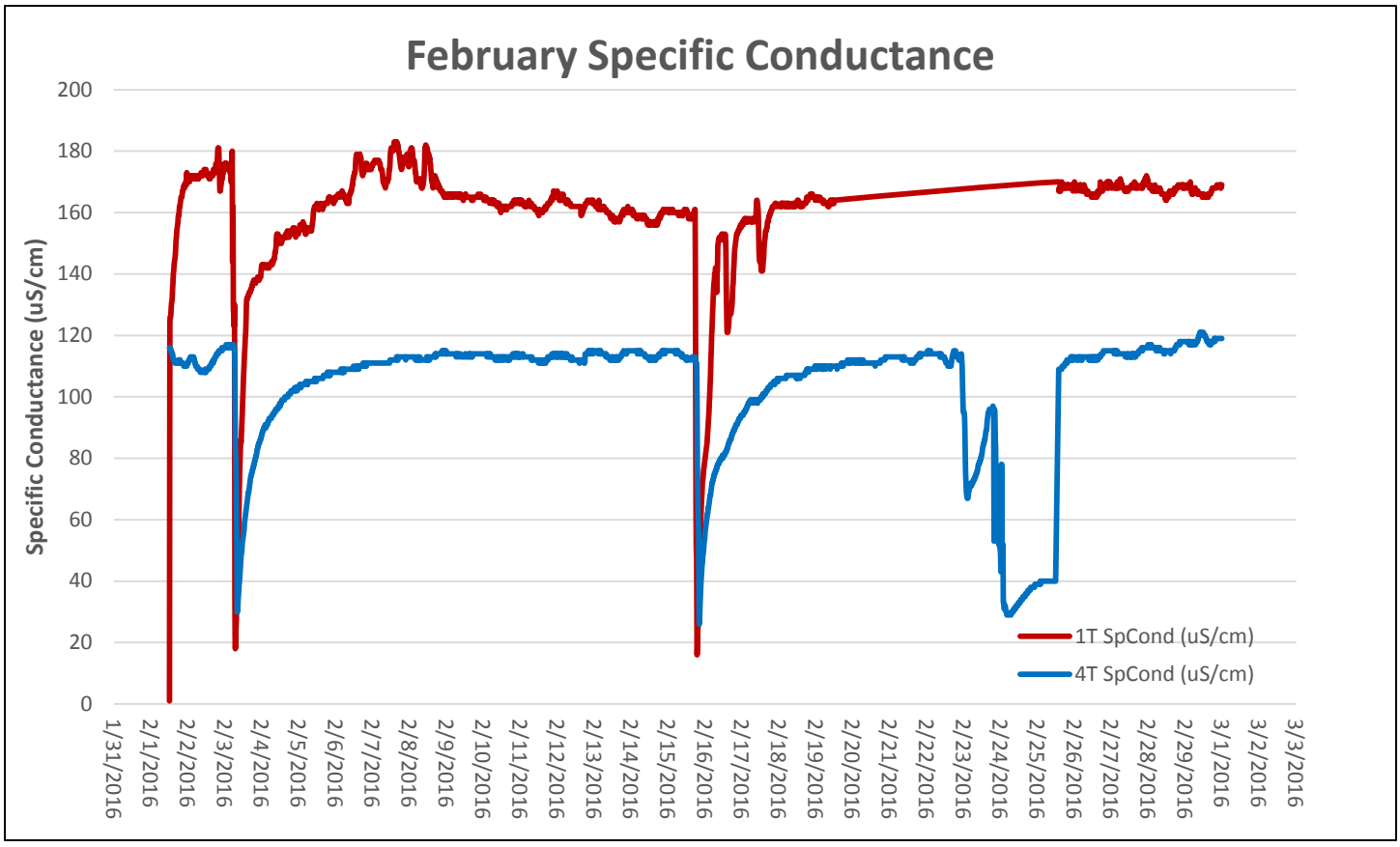

January Turbidity
Turbidity (NTU)
10000
1000
100
10
1
0.1
1T Turbidity (NTU)
4T Turbidity (NTU)
1/1/2016
1/3/2016
1/5/2016
1/7/2016
1/9/2016
1/11/2016
1/13/2016
1/15/2016
1/17/2016
1/19/2016
1/21/2016
1/23/2016
1/25/2016
1/27/2016
1/29/2016
1/31/2016

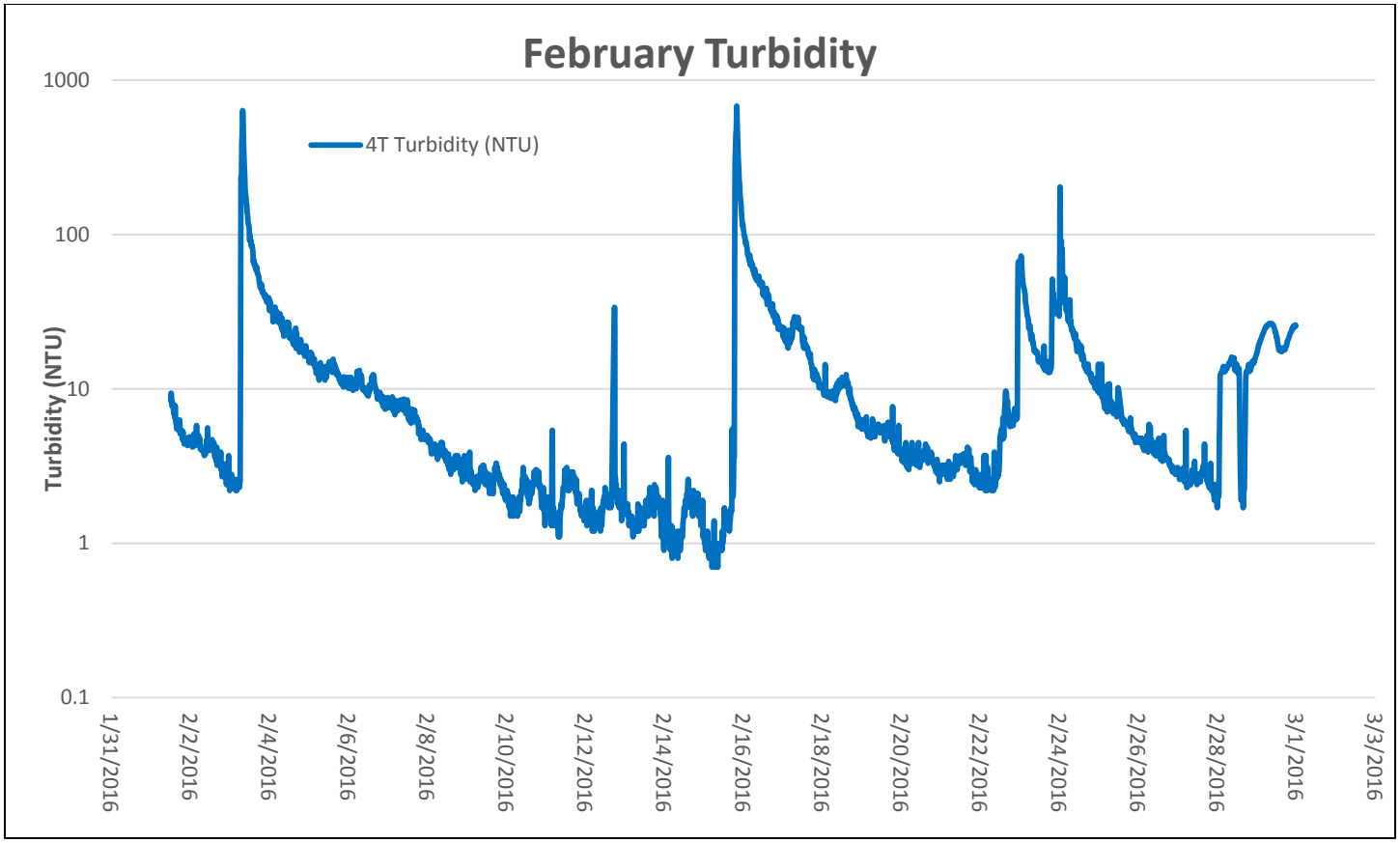


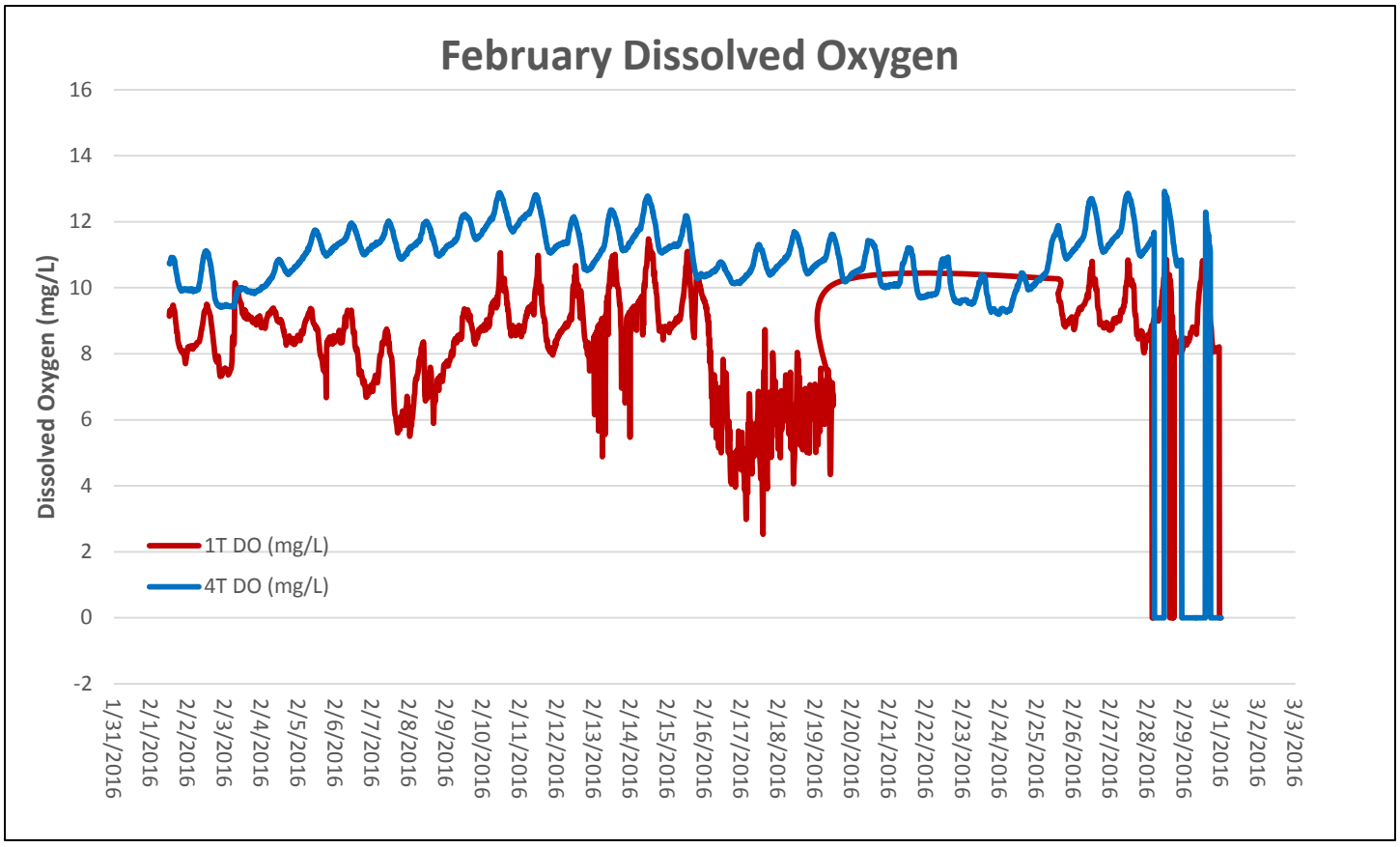
February 2016




February pH
pH Units
8
7.5
7
6.5
6
1T pH
4T pH
1/31/2016
2/1/2016
2/2/2016
2/3/2016
2/4/2016
2/5/2016
2/6/2016
2/7/2016
2/8/2016
2/9/2016
2/10/2016
2/11/2016
2/12/2016
2/13/2016
2/14/2016
2/15/2016
2/16/2016
2/17/2016
2/18/2016
2/19/2016
2/20/2016
2/21/2016
2/22/2016
2/23/2016
2/24/2016
2/25/2016
2/26/2016
2/27/2016
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016


February Specific Conductance
Specific Conductance (uS/cm)
200
180
160
140
120
100
80
60
40
20
0
1T SpCond (uS/cm)
4T SpCond (uS/cm)
1/31/2016
2/1/2016
2/2/2016
2/3/2016
2/4/2016
2/5/2016
2/6/2016
2/7/2016
2/8/2016
2/9/2016
2/10/2016
2/11/2016
2/12/2016
2/13/2016
2/14/2016
2/15/2016
2/16/2016
2/17/2016
2/18/2016
2/19/2016
2/20/2016
2/21/2016
2/22/2016
2/23/2016
2/24/2016
2/25/2016
2/26/2016
2/27/2016
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016


February Turbidity
1000
100
10
1
0.1
Turbidity (NTU)
4T Turbidity (NTU)
1/31/2016
2/2/2016
2/4/2016
2/6/2016
2/8/2016
2/10/2016
2/12/2016
2/14/2016
2/16/2016
2/18/2016
2/20/2016
2/22/2016
2/24/2016
2/26/2016
2/28/2016
3/1/2016
3/3/2016


February Dissolved Oxygen
16
14
12
10
8
6
4
2
0
-2
Dissolved Oxygen (mg/L)
1T DO (mg/L)
4T DO (mg/L)
1/31/2016
2/1/2016
2/2/2016
2/3/2016
2/4/2016
2/5/2016
2/6/2016
2/7/2016
2/8/2016
2/9/2016
2/10/2016
2/11/2016
2/12/2016
2/13/2016
2/14/2016
2/15/2016
2/16/2016
2/17/2016
2/18/2016
2/19/2016
2/20/2016
2/21/2016
2/22/2016
2/23/2016
2/24/2016
2/25/2016
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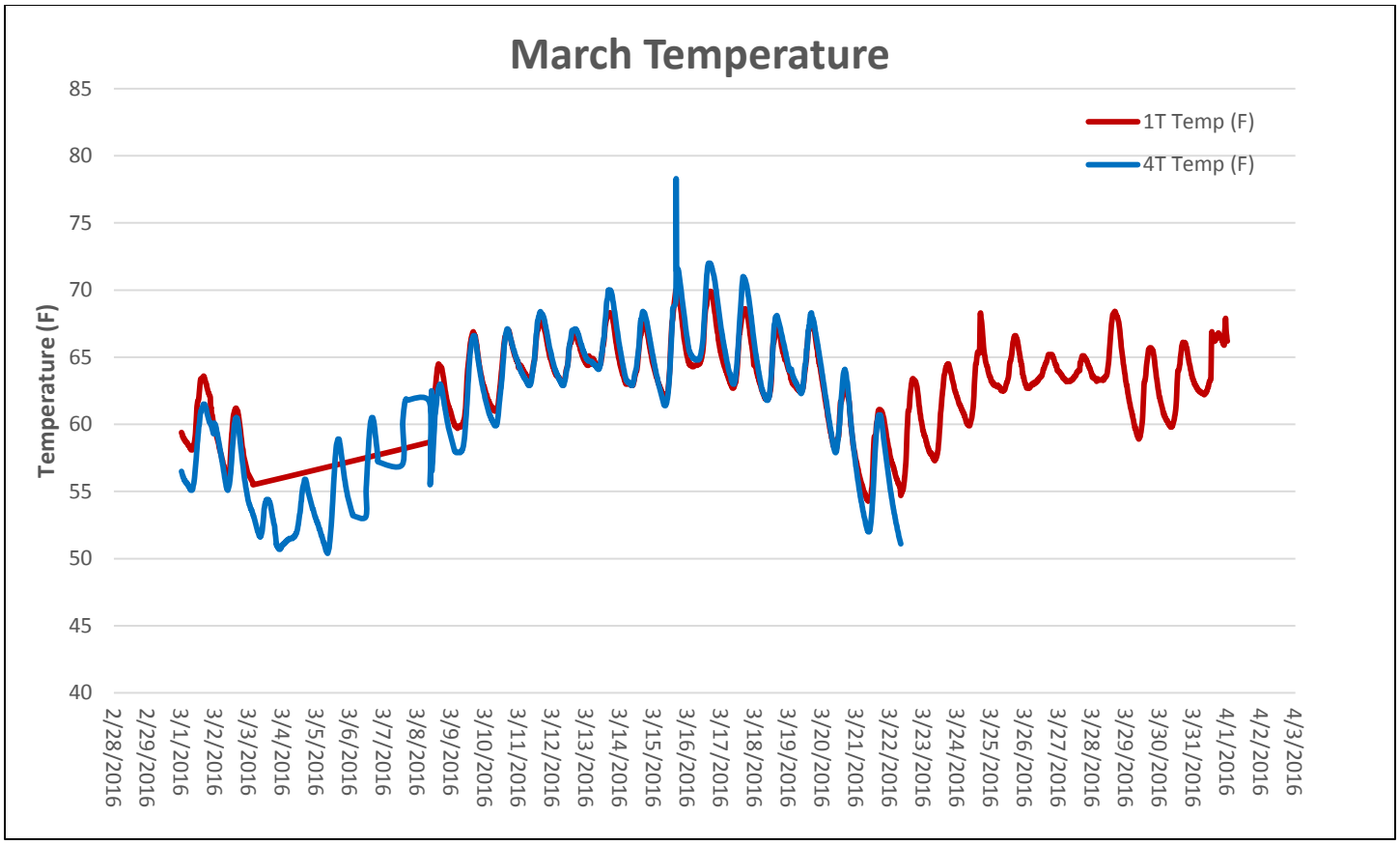
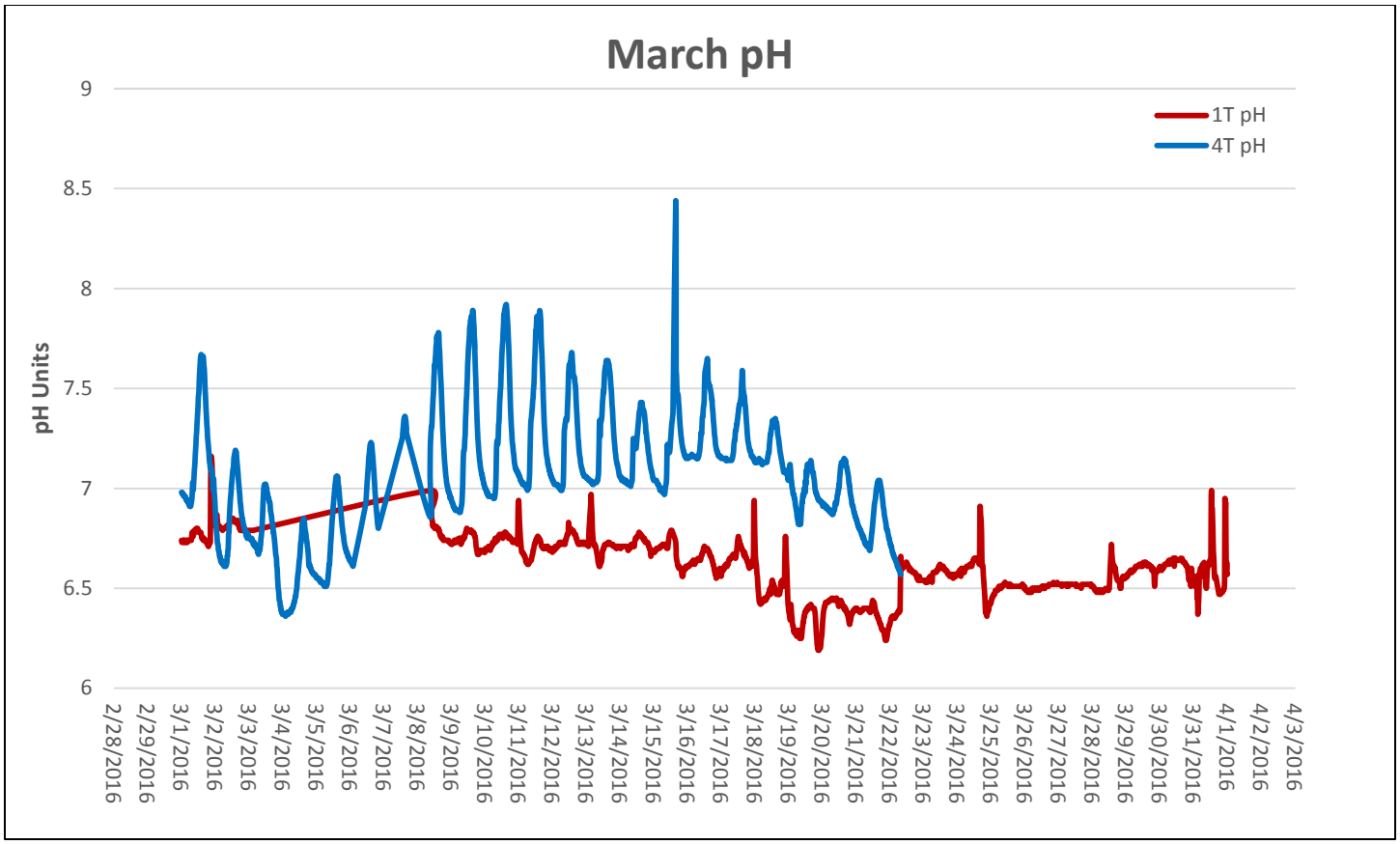
2/29/2016
3/1/2016
3/2/2016
3/3/2016

March 2016


March Temperature
1T Temp (F)
4T Temp (F)
Temperature (F)
85
80
75
70
65
60
55
50
45
40
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016
3/4/2016
3/5/2016
3/6/2016
3/7/2016
3/8/2016
3/9/2016
3/10/2016
3/11/2016
3/12/2016
3/13/2016
3/14/2016
3/15/2016
3/16/2016
3/17/2016
3/18/2016
3/19/2016
3/20/2016
3/21/2016
3/22/2016
3/23/2016
3/24/2016
3/25/2016
3/26/2016
3/27/2016
3/28/2016
3/29/2016
3/30/2016
3/31/2016
4/1/2016
4/2/2016
4/3/2016


March pH
1T pH
4T pH
pH Units
9
8.5
8
7.5
7
6.5
6
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016
3/4/2016
3/5/2016
3/6/2016
3/7/2016
3/8/2016
3/9/2016
3/10/2016
3/11/2016
3/12/2016
3/13/2016
3/14/2016
3/15/2016
3/16/2016
3/17/2016
3/18/2016
3/19/2016
3/20/2016
3/21/2016
3/22/2016
3/23/2016
3/24/2016
3/25/2016
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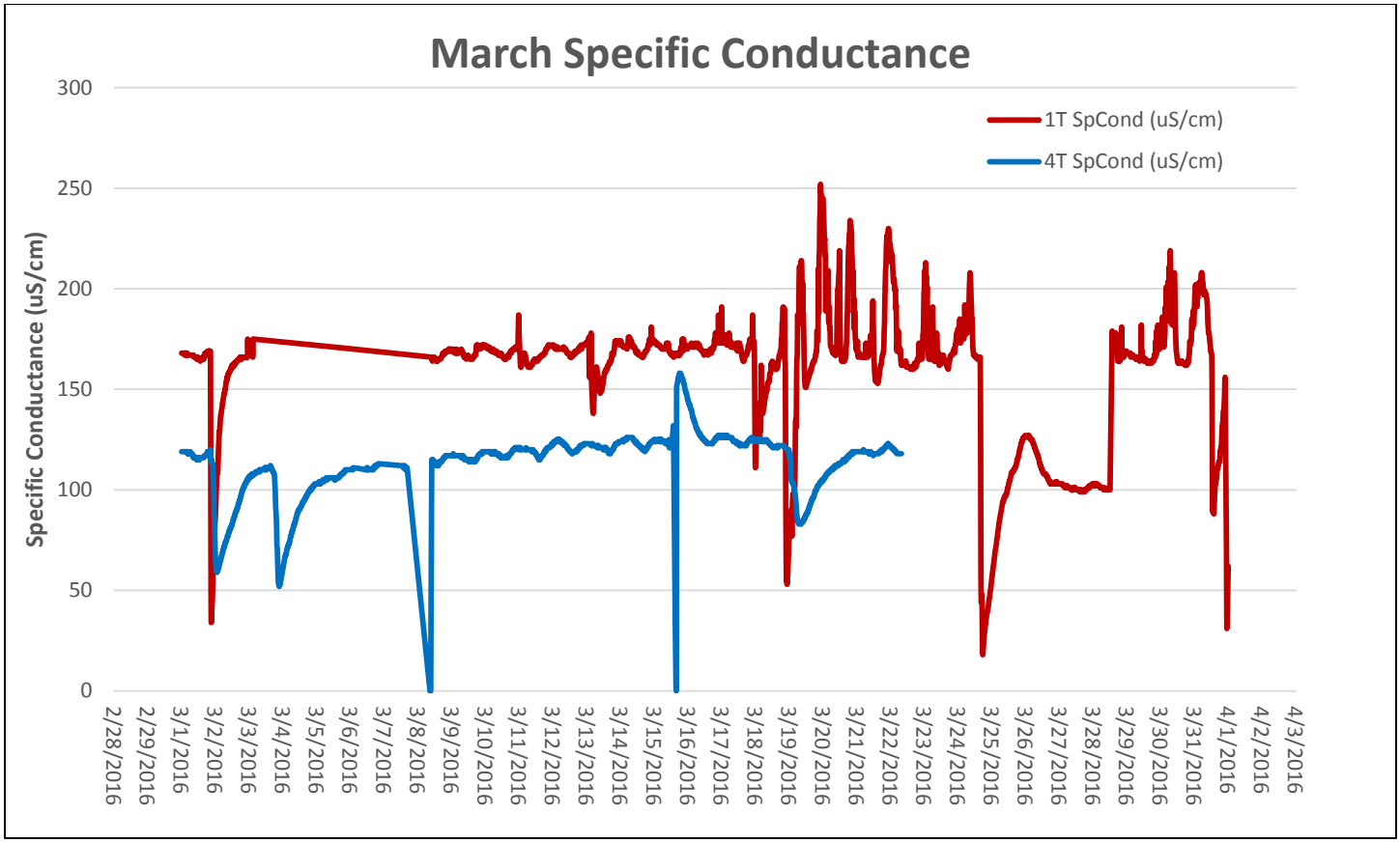
3/31/2016
4/1/2016
4/2/2016
4/3/2016


March Specific Conductance
1T SpCond (uS/cm)
4T SpCond (uS/cm)
Specific Conductance (uS/cm)
300
250
200
150
100
50
0
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016
3/4/2016
3/5/2016
3/6/2016
3/7/2016
3/8/2016
3/9/2016
3/10/2016
3/11/2016
3/12/2016
3/13/2016
3/14/2016
3/15/2016
3/16/2016
3/17/2016
3/18/2016
3/19/2016
3/20/2016
3/21/2016
3/22/2016
3/23/2016
3/24/2016
3/25/2016
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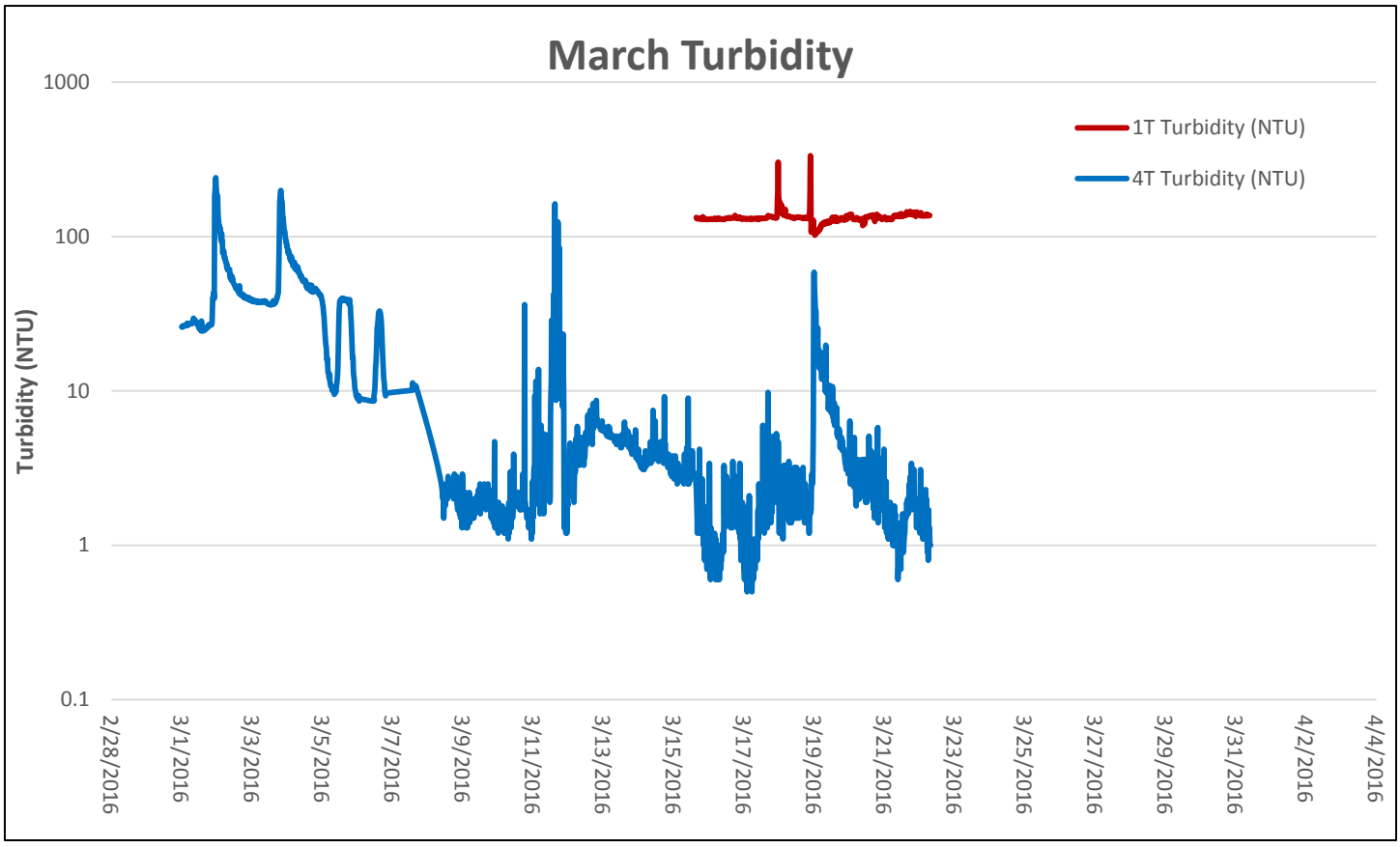
3/29/2016
3/30/2016
3/31/2016
4/1/2016
4/2/2016
4/3/2016


March Turbidity
1T Turbidity (NTU)
4T Turbidity (NTU)
Turbidity (NTU)
1000
100
10
1
0.1
2/28/2016
3/1/2016
3/3/2016
3/5/2016
3/7/2016
3/9/2016
3/11/2016
3/13/2016
3/15/2016
3/17/2016
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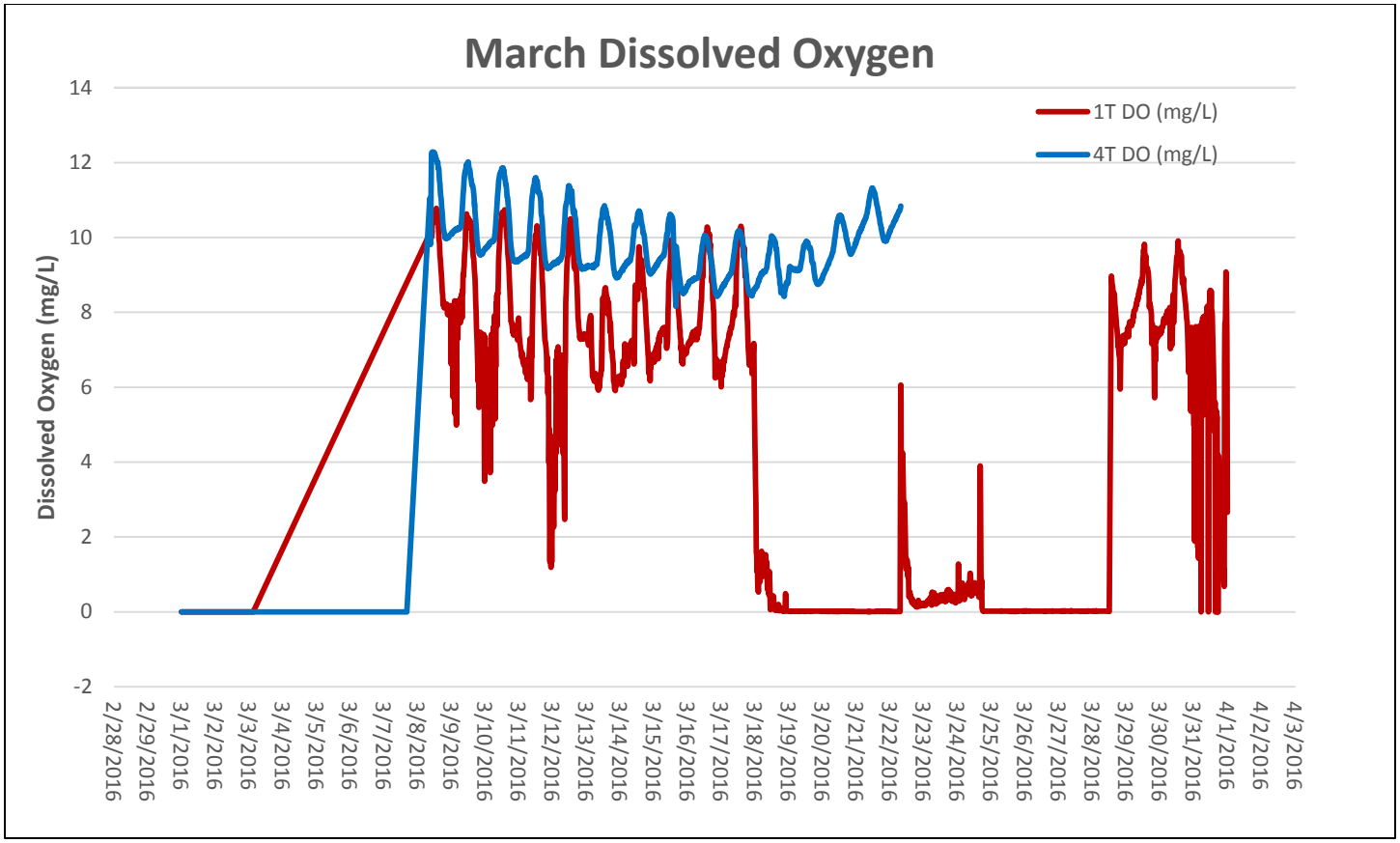
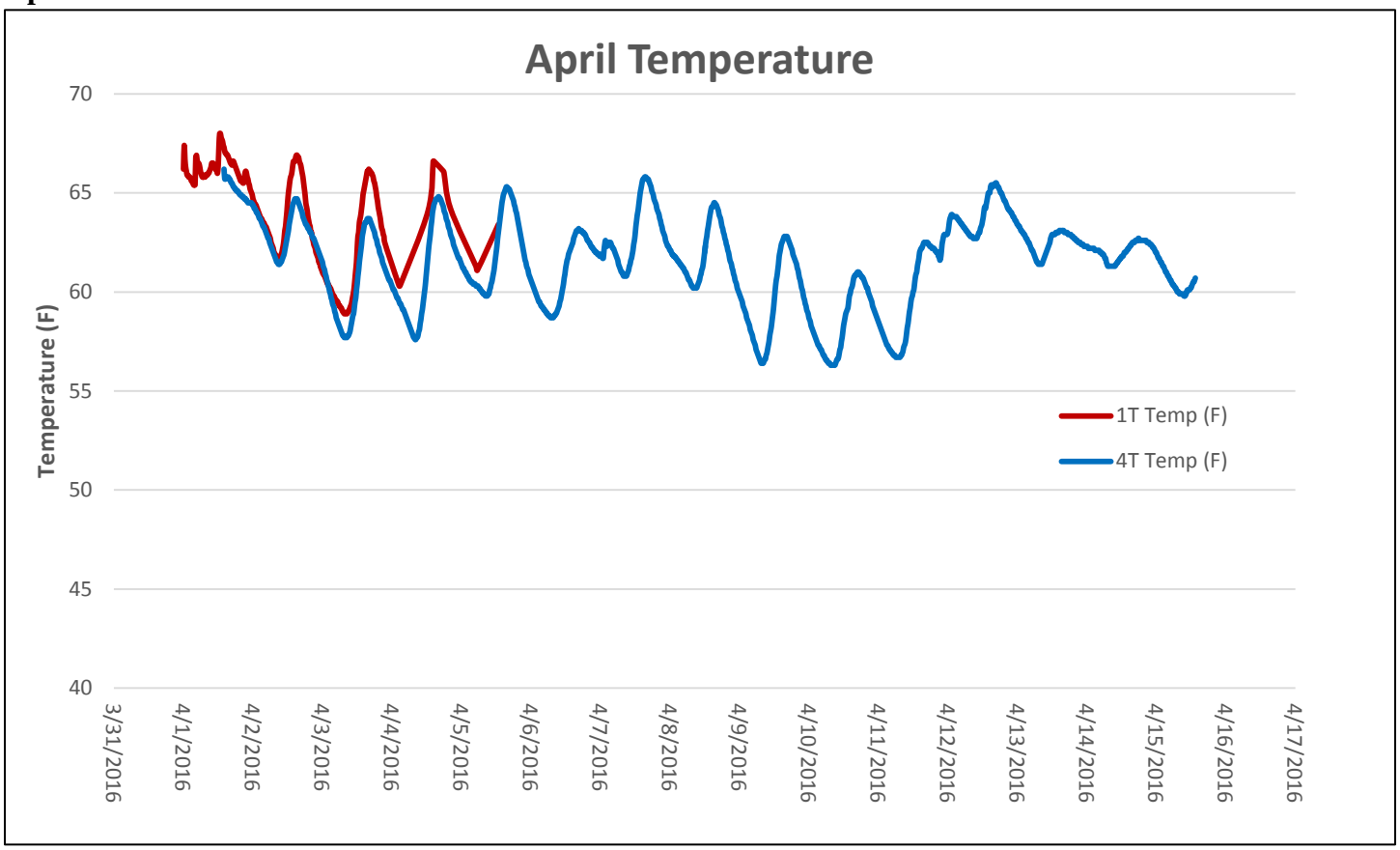
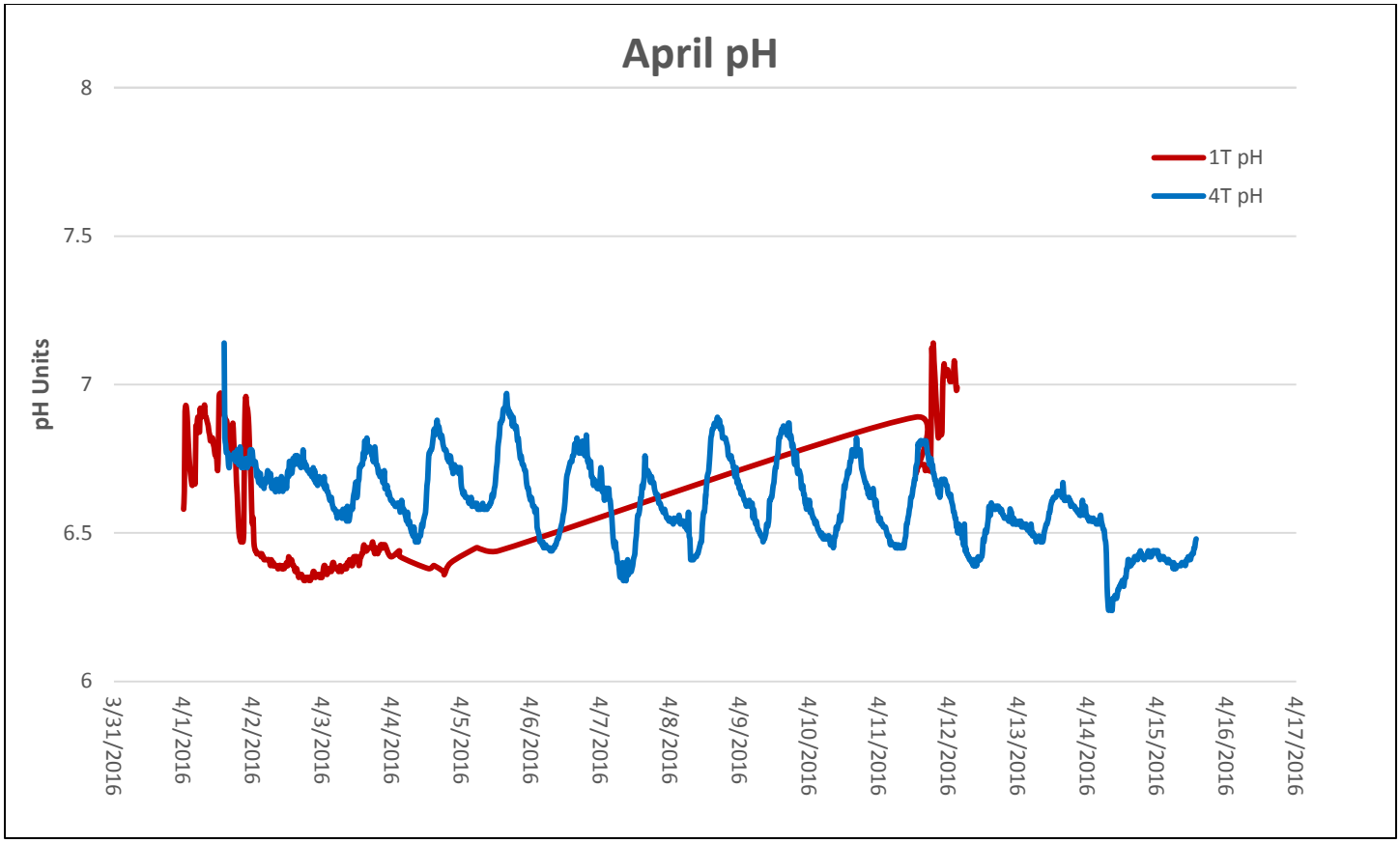
3/29/2016
3/31/2016
4/2/2016
4/4/2016


March Dissolved Oxygen
Dissolved Oxygen (mg/L)
1T DO (mg/L)
4T DO (mg/L)
14
12
10
8
6
4
2
0
-2
2/28/2016
2/29/2016
3/1/2016
3/2/2016
3/3/2016
3/4/2016
3/5/2016
3/6/2016
3/7/2016
3/8/2016
3/9/2016
3/10/2016
3/11/2016
3/12/2016
3/13/2016
3/14/2016
3/15/2016
3/16/2016
3/17/2016
3/18/2016
3/19/2016
3/20/2016
3/21/2016
3/22/2016
3/23/2016
3/24/2016
3/25/2016
3/26/2016
3/27/2016
3/28/2016
3/29/2016
3/30/2016
3/31/2016
4/1/2016
4/2/2016
4/3/2016

April 2016


April Temperature
Temperature (F)
1T Temp (F)
4T Temp (F)
70
65
60
55
50
45
40
3/31/2016
4/1/2016
4/2/2016
4/3/2016
4/4/2016
4/5/2016
4/6/2016
4/7/2016
4/8/2016
4/9/2016
4/10/2016
4/11/2016
4/12/2016
4/13/2016
4/14/2016
4/15/2016
4/16/2016
4/17/2016


April pH
8
7.5
7
6.5
6
pH Units
1T pH
4T pH
3/31/2016
4/1/2016
4/2/2016
4/3/2016
4/4/2016
4/5/2016
4/6/2016
4/7/2016
4/8/2016
4/9/2016
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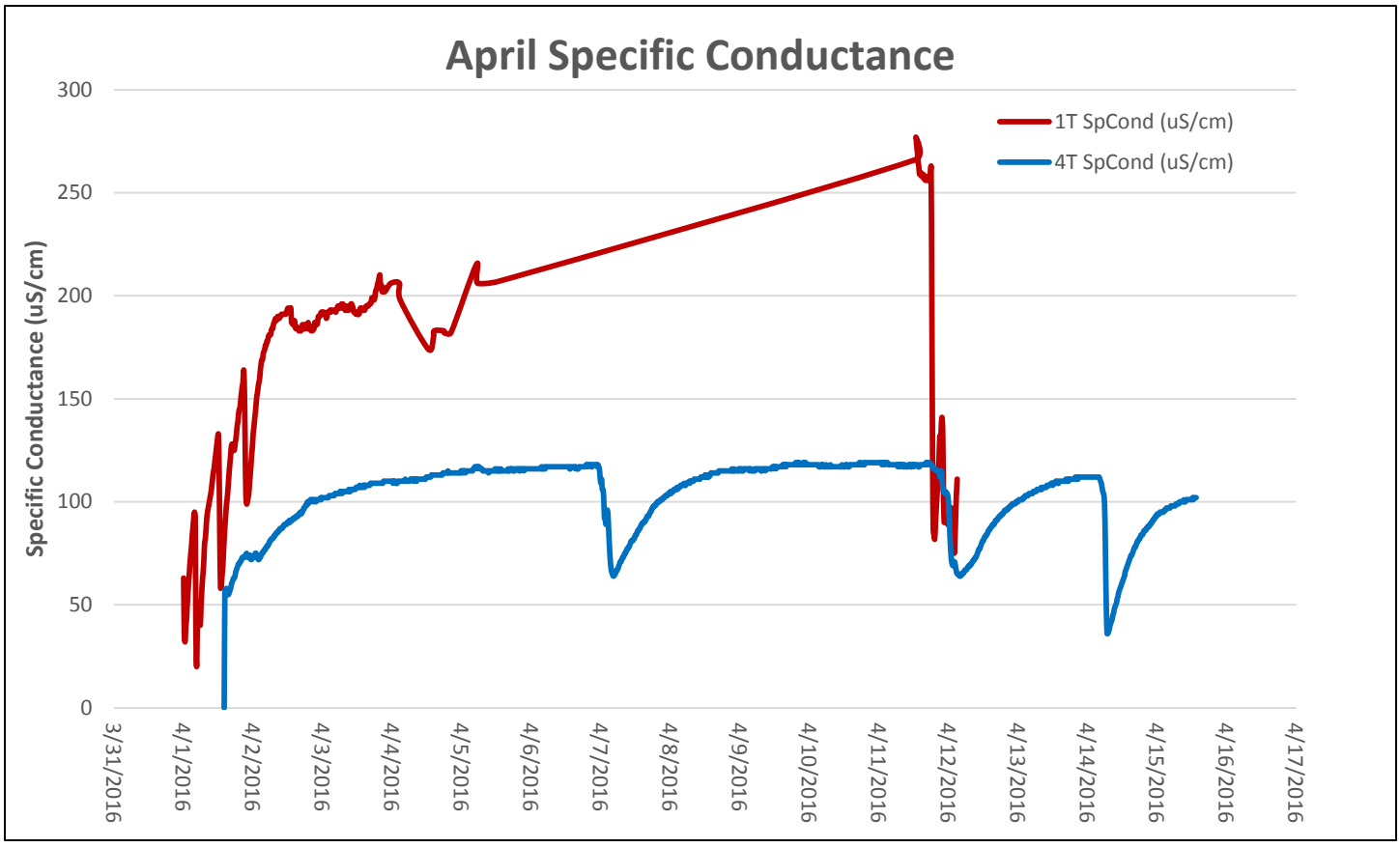
4/14/2016
4/15/2016
4/16/2016
4/17/2016


April Specific Conductance
300
250
200
150
100
50
0
Specific Conductance (uS/cm)
1T SpCond (uS/cm)
4T SpCond (uS/cm)
3/31/2016
4/1/2016
4/2/2016
4/3/2016
4/4/2016
4/5/2016
4/6/2016
4/7/2016
4/8/2016
4/9/2016
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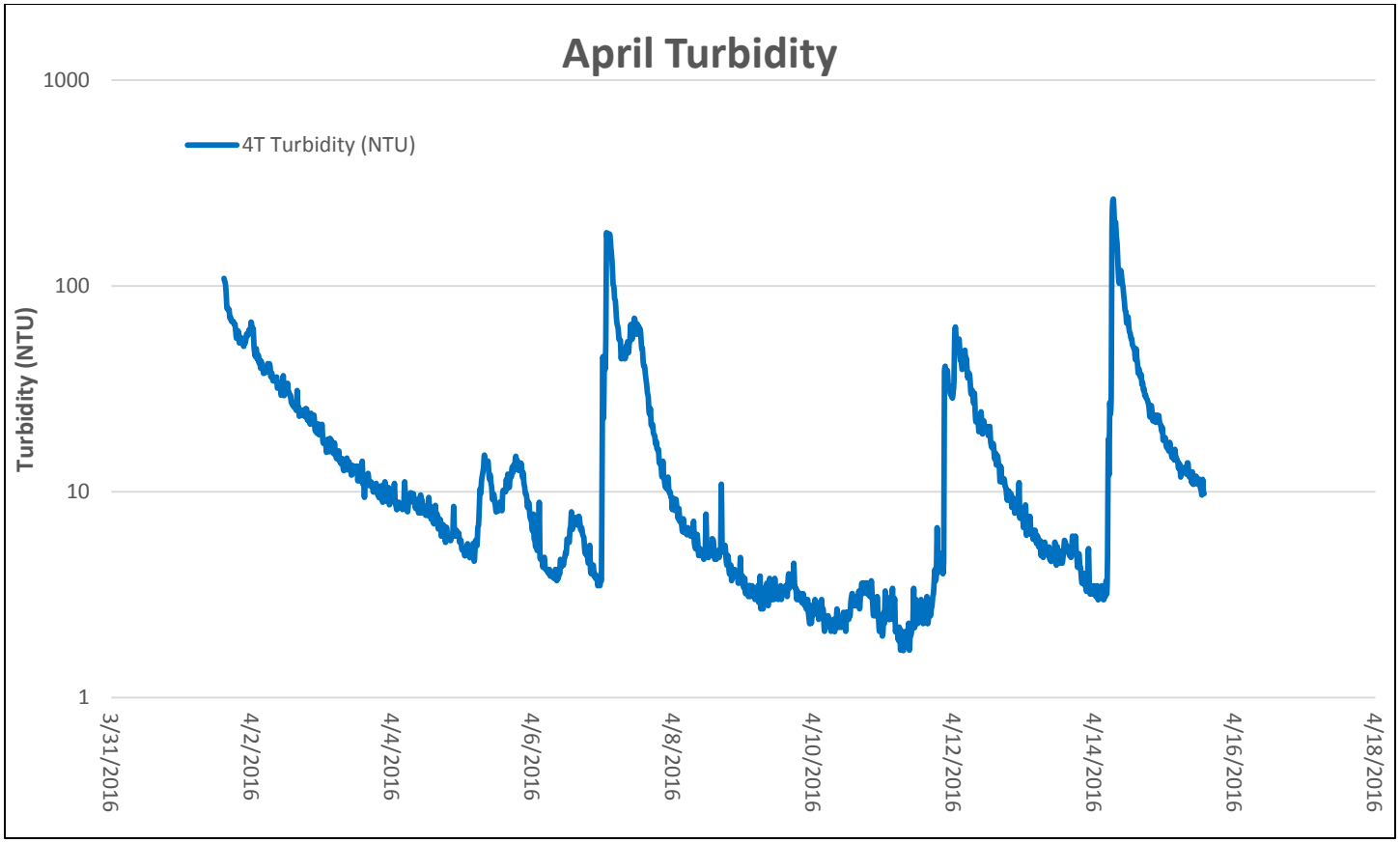
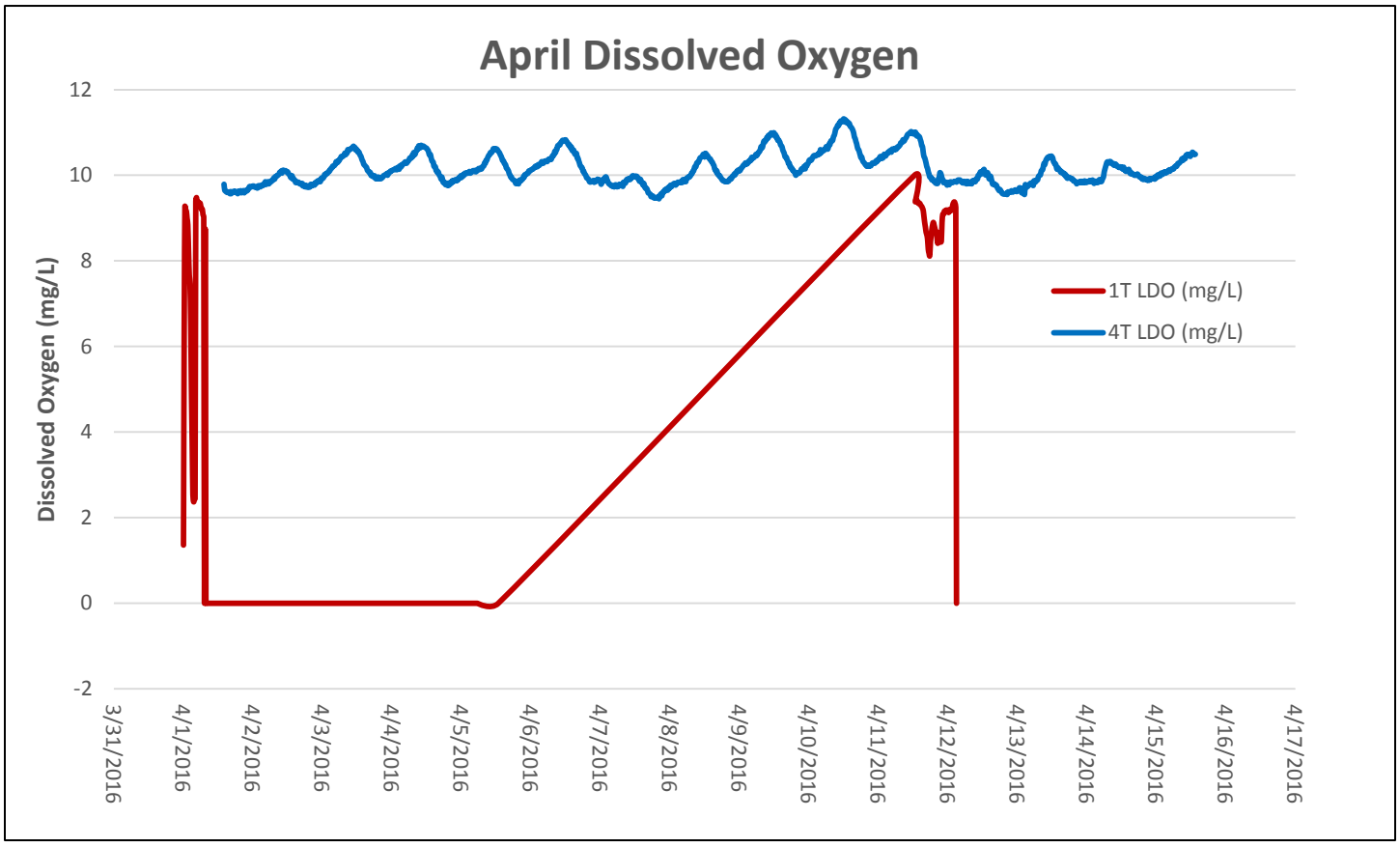
4/12/2016
4/13/2016
4/14/2016
4/15/2016
4/16/2016
4/17/2016


April Turbidity
1000
100
10
1
Turbidity (NTU)
4T Turbidity (NTU)
3/31/2016
4/2/2016
4/4/2016
4/6/2016
4/8/2016
4/10/2016
4/12/2016
4/14/2016
4/16/2016
4/18/2016


April Dissolved Oxygen
12
10
8
6
4
2
0
-2
Dissolved Oxygen (mg/L)
1T LDO (mg/L)
4T LDO (mg/L)
3/31/2016
4/1/2016
4/2/2016
4/3/2016
4/4/2016
4/5/2016
4/6/2016
4/7/2016
4/8/2016
4/9/2016
4/10/2016
4/11/2016
4/12/2016
4/13/2016
4/14/2016
4/15/2016
4/16/2016
4/17/2016

5.0 WPCF Dissolved Oxygen Monitoring

5.1 Purpose

As an expansion of the Water Resource Management Department's water quality monitoring program, staff began collecting in-stream dissolved oxygen data upstream and downstream of both WPCF's effluent discharge points beginning in August of 2006. This monitoring provides valuable data assuring that the effluent discharged from Auburn's WPCFs is not causing decreases in the dissolved oxygen content of Parkerson's Mill or Saugahatchee Creek during the critical summer months. Monitoring at the Northside WPCF was discontinued in 2013 due to closure of the plant. Monitoring is performed on a frequent basis (almost daily) using a YSI (Clark Cell) and/or Hach (LDO) dissolved oxygen probe at points both upstream and downstream of each effluent discharge location.

5.2 Definition and Methods

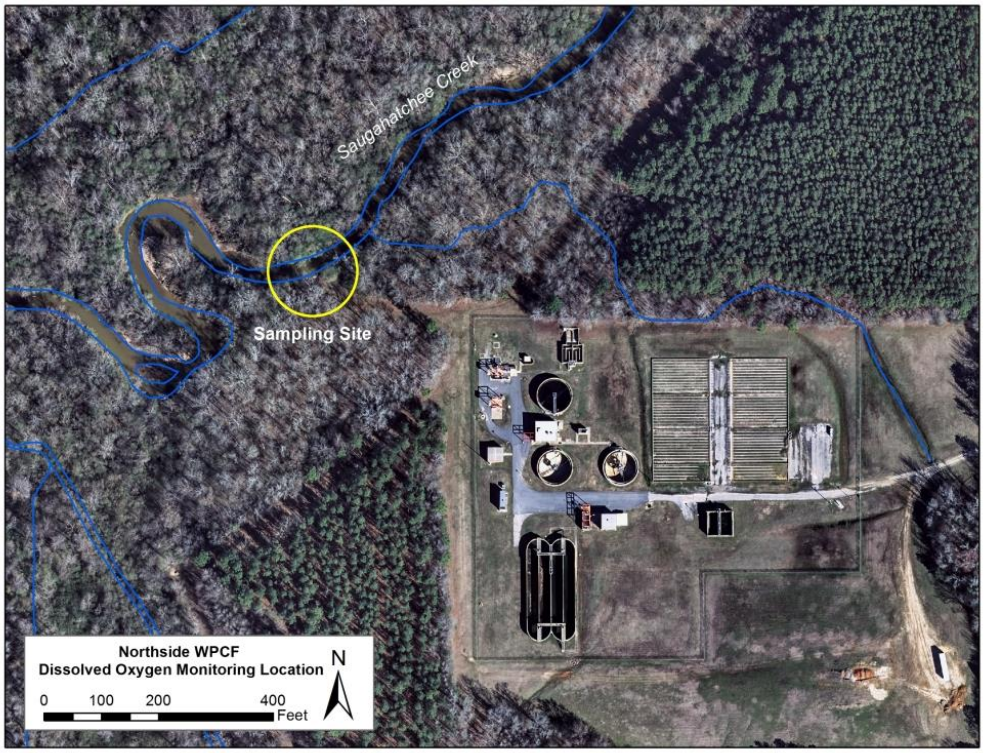
As noted above, dissolved oxygen measurements are taken with a YSI (Clark Cell) and/or HACH (Luminescent Dissolved Oxygen) probe.

- Dissolved Oxygen – This is the amount of oxygen that has been dissolved in the water column, which comes from both the atmosphere and photosynthesis by aquatic plants.

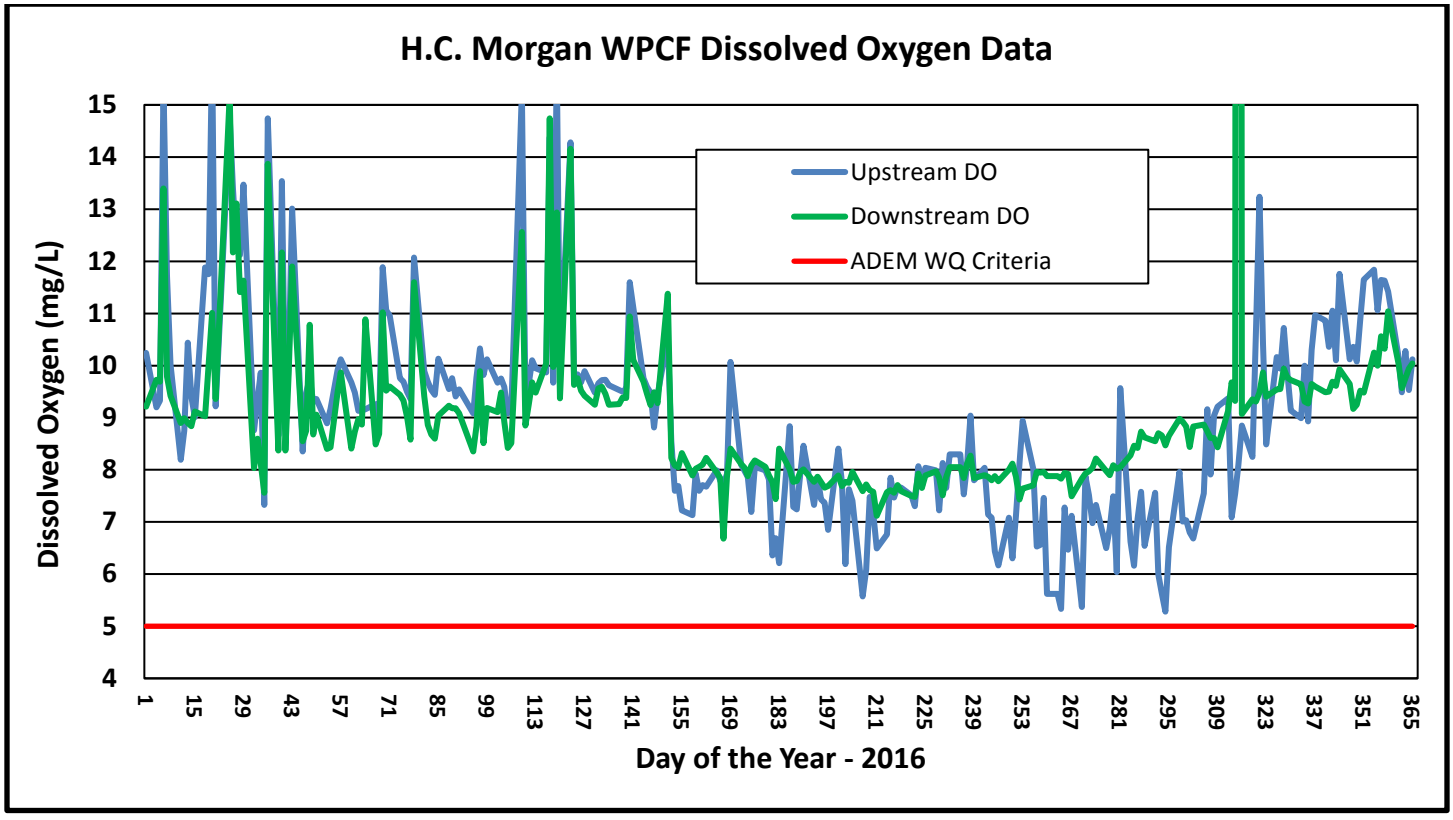
5.3 Monitoring Stations

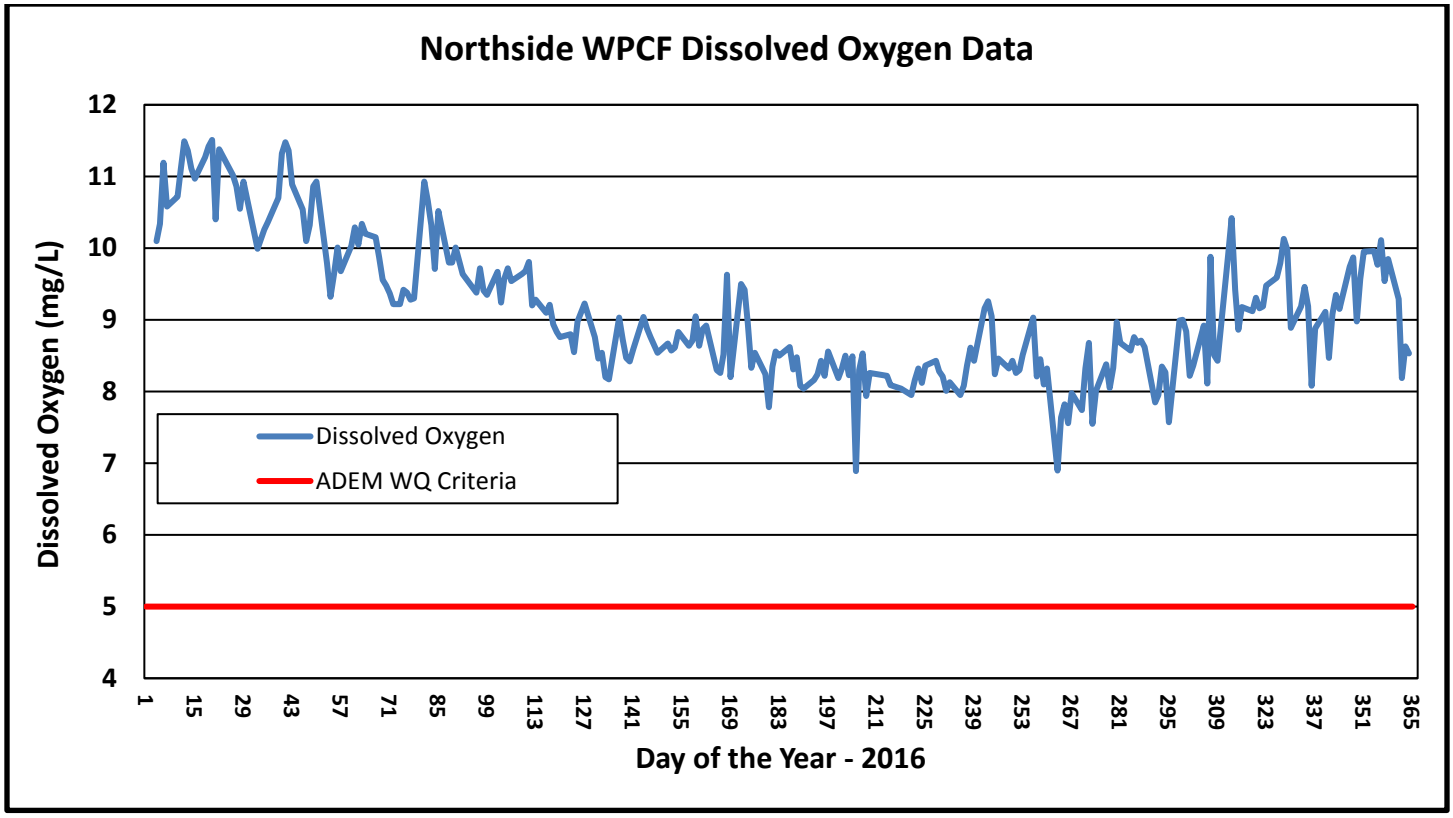
H.C. Morgan WPCF Upstream Latitude *32, 32, 9.890 N;* Longitude *85, 30, 20.443 W*
H.C. Morgan WPCF Downstream Latitude *32, 33, 9.077 N;* Longitude *85, 30, 19.699 W*

Northside WPCF Latitude *32, 37, 41.32 N;* Longitude *85, 32, 44.75 W*



5.4 Data





6.0 Outfall Screening

6.1 Purpose

According to ADEM Phase II NPDES General Permit ALR040003, the permitee shall implement an ongoing program to detect and eliminate illicit discharges to the MS4 to the maximum extent practicable. The permit requires a dry weather screening program to detect and address non-stormwater discharges to the MS4. The tables that follow include the water quality monitoring data that were collected at stormwater outfalls in 2016.

6.2 Data

Date	Site	Water Temp (F)	Dissolved Oxygen (mg/L)	pH	Specific Conductance (uS/cm)	Ammonia (mg/L)	Potassium (mg/L)	Surfactants (mg/L)	E-Coli (CFU/100mL)
11/17/16	P59	63.1	3.12	6.87	309	0.27	1	1.5	250
6/1/16	P61	88.7	7.18	6.9	83	0.28	0.6	0	50
6/1/16	P63	79	5.86	6.71	95	0.17	0.7	0	50
6/1/16	P64	79.4	6.62	6.91	94.9	0.18	0.6	0	0
5/25/16	P142	70.2	9.22	8.09		0.13	0.4	0	650
5/25/16	P145	73.5	8.89	7.59		0.26	0.5	0	0
4/27/16	P70	64.2	8.86	7.1	438	0.18	1.6	2.9	100
4/27/16	P71	64.8	7.61	6.36	161	1.68	0.8	2.16	200
4/27/16	P73	63.2	4.5	5.85	104	0.63	1	2	150
4/20/16	P66	71.3	7.15	6.91	310	0.01	1.3	3.4	200
4/20/16	P67	72.5	6.9	7.21	176				
4/20/16	P83	66.6	3.2	6.42	118	0.4	0.8	4.13	

Date	Site	Water Temp (F)	Dissolved Oxygen (mg/L)	pH	Specific Conductance (uS/cm)	Ammonia (mg/L)	Potassium (mg/L)	Surfactants (mg/L)	E-Coli (CFU/100mL)
4/11/16	P81	64	7.68	7.15	205	0.03	0.7	1.8	0
4/11/16	P82	68.4	6.22	7.11	215	0.05	0.7	1.1	100
4/6/16	P16	62.6	9.95	7.18	213				
4/6/16	P17	63.8	7.05	6.76	321	0.063	1.1	0	
4/6/16	P77	60.3	7.57	7.08	265				
3/30/16	P1	60.9	6.49	6	235	0.52	3.1	0	
3/30/16	P1P					0	0		
3/30/16	P72	62.6	8.42	7.35	181	0.08	0.7	0	
3/24/16	P2P	63.3	8.09	8.5	228	0.15	4	0	
3/24/16	P4	57.5	0.72	6.58	435	4.68	2.8	0	
3/9/16	P10	61.4	6.5	6.84	422	0.07	3.8	2.4	
3/9/16	P12	60.4	8.51	7.05	250	0.13	2	1.5	
2/10/16	P2			6.87		0.04	1.5	2.3	
2/10/16	P4			6.9		0.4	4.1	2.4	

7.0 Source Water Monitoring Program (Lake Ogletree)

7.1 Purpose

The Lake Ogletree reservoir, located in southeast Auburn, Alabama, is the City of Auburn's primary drinking water source. At full pool its surface area is approximately 300 acres with a volumetric capacity of approximately 1.5 billion gallons of water. Chewacla Creek is the primary feeder stream of Lake Ogletree, which has a 33 square mile watershed (as delineated from the Lake Ogletree dam and spillway). Although mostly forested and agricultural lands, the Lake Ogletree watershed includes industrial, commercial/retail, and residential land-uses, which should increase as the population of Lee County increases. Although a recently updated Source Water Assessment Program (SWAP) determined Lake Ogletree to be at low to moderate risk from stormwater-driven pollutants, it is imperative that water quality monitoring be performed to identify potential threats to water quality and to protect the health and vitality of Chewacla Creek and the encompassing watershed. Therefore, the Water Works Board of the City of Auburn (AWWB) is committed to performing monitoring and analysis of a wide range of physical, chemical, and mineral water quality parameters both in Lake Ogletree and its contributing watershed.

7.2 Methods

AWWB conducts water quality sampling and analysis at 14 locations throughout the Lake Ogletree Watershed. Water quality assessment includes sampling at locations along the main stem of Chewacla Creek ("C-Sites"), its smaller tributaries ("T-Sites"), and Lake Ogletree ("L-Sites"). Parameters monitored once every two months at these locations include fecal coliforms, E. coli, chlorophyll-a, ammonia, orthophosphate, total phosphorus, nitrate-nitrite, kjeldahl-N, pH, temperature, turbidity, specific conductance, dissolved oxygen and an array of minerals. A QA/QC field blank for ammonia, orthophosphate, total phosphorus, nitrate-nitrite, and kjeldahl-N is collected at a single randomly selected site during each sampling round. Bi-weekly monitoring is also conducted at these sites for temperature, pH, specific conductance, dissolved oxygen, and turbidity. Off-flavor compounds

(2-methylisoborneol and geosmin) are sampled for at the drinking water intake (site L2) on a biweekly to weekly basis, depending on the time of year. The following are the parameters which are included in this program and the method of analysis.

- Temperature – YSI ProPlus Quatro
- Specific Conductance – YSI ProPlus Quatro
- Dissolved Oxygen – YSI 2003 polarographic sensor
- pH – YSI 1001
- Chlorophyll a - SM 10200H-2-1994
- Turbidity – LaMotte 2020WE turbidimeter
- Nitrate+Nitrite – EPA 353.2
- Total Kjeldahl Nitrogen – EPA 351.2
- Orthophosphate – SM 4500 PE-1999
- Total Phosphorus – EPA 365.4
- E. coli - SM 9223B-2004
- 2-Methylisoborneol – SM 6040 D
- Geosmin – SM 6040 D

7.3 Monitoring Stations and Data

T11 – Station T11 is located on lower Robinson Creek at Moore's Mill Road (CR 146). Latitude *32, 33, 48.221 N*; Longitude *85, 23, 23.423 W*

T12N – Station T12N is located upper Robinson Creek, just upstream of Highway 51 and downstream from an Opelika sanitary sewer lift station. Latitude *32, 37, 1.72 N*; Longitude *85, 22, 9.316 W*

T19 – Station T19 is located on an unnamed tributary upstream of Emerald Lake. Latitude *32, 35, 36.364 N*; Longitude *85, 20, 37.00 W*

T22 – Station T22 is located on upper Robinson Creek, just downstream of Highway 51 and downstream from three Opelika sanitary sewer lift stations. Latitude *32, 36, 2.361 N*; Longitude *85, 22, 45.426 W*

T32 – Station T32 is located near the mouth of Nash Creek just before the confluence with Chewacla Creek. Latitude *32, 33, 18.484 N*; Longitude *85, 25, 30.655 W*

T34 – Station T34 is located on Chewacla Creek, upstream of Station C8. Latitude *32, 34, 32.672 N*; Longitude *85, 21, 49.692 W*

C1 – Station C1 is located at the forebay of Lake Ogletree, immediately downstream of the Society Hill Road bridge crossing. Latitude *32, 33, 20.161 N*; Longitude *85, 25, 36.026 W*

C2 – Station C2 is located at the bridge crossing of CR 027 with Chewacla Creek. Latitude *32, 33, 21.387 N*; Longitude *85, 24, 46.384 W*

C5 – Station C5 is located at the bridge crossing of Lee Road. 112 with Chewacla Creek. Latitude *32, 33, 6.291 N*; Longitude *85, 23, 41.151 W*

C7 – Station C7 is located at the bridge crossing of Highway 51 (Marvyn Parkway) with Chewacla Creek. Latitude *32, 33, 41.868 N*; Longitude *85, 22, 20.559 W*

C8 – Station C8 is located upstream of the bridge crossing of CR 146 (Moore's Mill Road) with Chewacla Creek. Latitude *32, 34, 5.715 N*; Longitude *85, 21, 42.033 W*

L1 – Station L1 is located in Lake Ogletree, immediately northeast of the Lake Ogletree spillway. Latitude *32, 32, 50.846 N*; Longitude *85, 26, 52.83 W*

L2 – Station L2 is located in Lake Ogletree near the water intake pump house. Latitude *32, 33, 5.626 N*; Longitude *85, 26, 45.038 W*

L5 – Station L5 is located along the northwest finger of Lake Ogletree, near the confluence with the East Lake/Green Chapel tributary. Latitude *32, 33, 37.961 N*; Longitude *85, 25, 38.369 W*

**See Insert for Maps of All Water Quality Monitoring Locations*

Date	Site	Sample Time	MIB (ug/L)	Geosmin (ug/L)	Temperature (F)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Chlorophyll-a (ng/L)
2/9/2017	C1	1035			56.8	10.36	7.22	11.4	
12/19/2016	C1	1015			50	11.62	7.58	4.43	
10/31/2016	C1	1225			67.5	9.95	7.7	2.04	
8/17/2016	C1	1030			80.5	8.27	7.51	3.64	
6/22/2016	C1	1450			89.5	7.7	8.31	6.26	
4/28/2016	C1	1430			80.4	9.23	8.08	3.76	
2/17/2016	C1	1015			51.5	11.04	7.23	15.6	
2/9/2017	C2	1130			56.4	10.07	7.14	10.03	
6/22/2016	C2	915			71.4	7.04	6.69	9.32	
4/28/2016	C2	925			67	8.76	7.45	8.27	
2/17/2016	C2	1215			52.5	10.61	7.18	12.6	
2/9/2017	C5	1145			56.4	9.74	7.12	10.41	
12/19/2016	C5	1045			48.5	10.18	7.44	3.88	
10/31/2016	C5	1155			62	4.61	7.86	5.28	
8/17/2016	C5	1105			77.6	5.36	7.2	8.67	
6/22/2016	C5	940			70.1	7.76	6.86	6.03	
4/28/2016	C5	950			63.8	8.03	7.36	6.81	
2/17/2016	C5	1230			52.8	10.74	7.24	13.2	
2/9/2017	C7	1200			55.4	9.43	6.97	9.93	
12/19/2016	C7	1105			49.7	8.2	7.25	5.21	
8/17/2016	C7	1120			80.6	5.65	7.15	9.1	
6/22/2016	C7	950			70.3	7.02	6.95	9.76	
4/28/2016	C7	1005			68.7	7.94	7.18	8.32	
2/17/2016	C7	1250			52.7	10.45	7.12	12.2	
2/9/2017	C8	1210			57	10.95	7.05	11.92	
12/19/2016	C8	1120			48.5	10.01	7.21	3.75	
10/31/2016	C8	1215			65.9	5.4	7.45	2.55	
8/17/2016	C8	1135			77.8	4.2	6.87	6.07	

Date	Site	Sample Time	MIB (ug/L)	Geosmin (ug/L)	Temperature (F)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Chlorophyll-a (ng/L)
6/22/2016	C8	1005			72.6	7.35	6.98	5.69	
4/28/2016	C8	1025			70.4	8.41	7.16	6.49	
2/17/2016	C8	1300			54.5	11.13	7.17	13.5	
2/9/2017	L1	955			55.6	10.33	7.12	6.06	
12/20/2016	L1	1020			53.1	11.15	8.11	10.33	
12/19/2016	L1	915			52.9	10.51	7.9	11.1	
10/31/2016	L1	1050			71.3	10.5	8.85	8.28	17.92
8/17/2016	L1	1405			90.4	8.01	8.69	5.67	
6/22/2016	L1	1415			85.6	6.7	8.67	3.86	
4/28/2016	L1	1405			75.9	9.09	8.3	3.23	
2/17/2016	L1	955			51.3	10.81	7.2	17.2	
3/29/2017	L2	850	0	23.7	68.9	9.93	7.85	1.77	
3/15/2017	L2	1350	0	11	58	10.25	7.57	5.26	
3/1/2017	L2	935	0	11.1	61.3	10.31	7.72	3.69	
2/15/2017	L2	840	0	6.7	57.8	10.53	7.46	5.84	
2/9/2017	L2	1005			55.4	10	7.22	6.1	
1/31/2017	L2	930	0	10.1	54	9.63	7.24	10.27	
1/10/2017	L2	1325			51.4	8.98	7.4	19.8	
12/28/2016	L2		0	19.1	61.4	11.73	8.58		
12/20/2016	L2	940			52	11.36	8.09	10.52	
12/19/2016	L2	905			52.6	10.52	7.78	11.6	
11/15/2016	L2	955			61.2	8.97	7.89	14.1	
11/8/2016	L2	1030	8	13.5	66.1	7.42	8.09	14.7	
11/1/2016	L2	1115	6.2	15.4	71.8	10.28	9	8.05	
10/31/2016	L2	1050			71	10.3	8.79	8.69	15.34
10/24/2016	L2	1030	6.3	24.1	68.2	9.5	8.5	8.93	
10/18/2016	L2	1020			74.6	10.35	8.9	7.54	
10/12/2016	L2	1030			71.7	9.25	8.4	10.86	
10/5/2016	L2	1130	5.7	5.8	76.6	8.2	8.43	13.7	
9/27/2016	L2	1130			83.9	9.06	8.73	8.67	
9/20/2016	L2	1010			83.1	8.48	8.38	11.34	
9/13/2016	L2	1030	10.8	3.7	83.5	7.81	8.37	6.83	
8/30/2016	L2	1115	4.7	4	86.5	7.05	7.48	7.8	
8/17/2016	L2	1350			89.5	8.1	7.69	7.18	
8/16/2016	L2	1010	5.2	5.8	88.2	7.24	8.61	9.54	
7/27/2016	L2	1010	2.4	8.3	87.9	6.53	8.73	5.72	
7/13/2016	L2	1045	2.4	7.7	87.7	7.98	8.61	5.25	
6/28/2016	L2	915	4.7	7.8	86.5	8.6	8.86	4.65	
6/22/2016	L2	1345			86.8	7.72	8.4	4.25	
6/14/2016	L2	1135	1.7	5.4	88.4	8.12	8.43	4.18	
6/1/2016	L2	1310	3.6	5.6	87.5	8.83	8.62	3.07	
5/17/2016	L2	1200	0	6.6	76.8	8.95	7.98	3.11	

Date	Site	Sample Time	MIB (ug/L)	Geosmin (ug/L)	Temperature (F)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Chlorophyll-a (ng/L)
5/4/2016	L2	850	4	11.7	75.8	9.1	7.97	3.62	
4/28/2016	L2	1345			77.6	9.25	8.25	3.07	
4/19/2016	L2	850	3.9	15.8	67	9.5	7.3	10.96	
4/5/2016	L2	1010	0	12.5	66.1	8.23	6.9	32	
3/23/2016	L2				55.1	3.89	6.88		
3/22/2016	L2	1005	2.9	60.7	63.6	9.05	7.09	3.98	
3/9/2016	L2	1130	0		61.5	10.76	7.41	8.19	
3/1/2016	L2	935	0	52.8	57.2	10.89	7.28	11.3	
2/17/2016	L2	850	0	34.5	51.5	10.9	7.44	17.6	
2/9/2016	L2	915	0	25.4	51	10.23	7.24	20.6	
1/12/2016	L2	1105	1.3	5.4	51.5	7.36	7.26	26.8	
2/9/2017	L5	1025			57.3	9.57	7.22	11.2	
12/19/2016	L5	955			48.9	11.04	7.62	2.32	
10/31/2016	L5	1250			64.3	6.22	7.34	0.67	
8/17/2016	L5	1010			77.1	7.35	7.09	1.19	
6/22/2016	L5	1430			89.6	6.14	8.37	5.69	
4/28/2016	L5	1420			81.5	8.98	8.01	3.45	
2/17/2016	L5	1005			52.9	10.49	7.17	33.6	
2/9/2017	T11	1335			57.3	10.2	7.2	12.04	
12/19/2016	T11	1300			50.4	11.13	7.28	4.12	
10/31/2016	T11	1315			63.7	7.15	7	3.37	
8/17/2016	T11	1325			78.7	7.35	7.14	4.99	
6/22/2016	T11	1135			71.2	8.24	7.15	4.34	
4/28/2016	T11	1140			65.4	9.25	7.19	5.88	
2/17/2016	T11	1420			54.7	10.82	7.21	17.2	
2/9/2017	T12N	1255			58	9.58	7.09	4.13	
12/19/2016	T12N	1210			55.2	10.05	7.28	1.27	
10/31/2016	T12N	1325			72.1	7.72	7.5	1.17	
8/17/2016	T12N	1250			80.6	7.23	7.3	1.48	
6/22/2016	T12N	1050			74.2	7.59	7.17	1.87	
4/28/2016	T12N	1105			65.3	8.93	7.06	6.29	
2/17/2016	T12N	1340			56	10.02	7.07	8.01	
2/9/2017	T19	1310			57.8	9.74	7.14	13	
12/19/2016	T19	1230			49.9	10.52	7.29	6.12	
10/31/2016	T19	1345			66.3	2.59	7.01	14.6	
8/17/2016	T19	1305			76	4.12	6.94	11.3	
6/22/2016	T19	1110			71.5	6.52	7.05	10.7	
4/28/2016	T19	1120			71.8	7.91	7.16	10.8	
2/17/2016	T19	1355			54.6	10.49	7.22	14.3	
2/9/2017	T22	1240			56.7	11.5	7.04	10.41	
12/19/2016	T22	1150			49.5	11.01	7.22	6.2	
10/31/2016	T22	1315			63	8.34	7.49	4.39	

Date	Site	Sample Time	MIB (ug/L)	Geosmin (ug/L)	Temperature (F)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Chlorophyll-a (ng/L)
8/17/2016	T22	1235			76.1	7.11	7.1	3.95	
6/22/2016	T22	1035			69.8	8.02	7.06	5.74	
4/28/2016	T22	1050			64.9	8.29	7.12	6.23	
2/17/2016	T22	1330			55.1	10.62	7.09	20.5	
2/9/2017	T32	1045			54.9	10.63	7.25	26	
12/19/2016	T32	1025			48.7	11.6	7.56	3.86	
10/31/2016	T32	1215			63.1	6.3	7.2	0.95	
8/17/2016	T32	1040			75.9	8.01	7.49	6.34	
6/22/2016	T32	1500			75.6	7.03	8.03	6.09	
4/28/2016	T32	1445			70.5	9.25	7.77	7.28	
2/17/2016	T32	1020			50.9	11.23	7.32	21.1	
2/9/2017	T34	1225			55.1	10.47	7.02	11.48	
12/19/2016	T34	1420			48.7	9.97	7.33	3.76	
8/17/2016	T34	1150			77.4	4.66	6.82	7.13	
6/22/2016	T34	1020			73.5	6.76	6.99	5.76	
4/28/2016	T34	1035			70.8	8.05	7.14	7.09	
2/17/2016	T34	1315			54.7	10.97	7.14	14	

Date	Site	Sample Time	Nitrate (mg/L)	Secchi Depth (ft.)	Specific Conductance (uS/cm)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)	Kjeldahl Nitrogen (mg/L)	E-Coli (MPN)
2/9/2017	C1	1035	0.062		64	0	0	0	411
12/19/2016	C1	1015	0.031		110	0.025	0	1.42	7
10/31/2016	C1	1225	0.024		94	0	0	0	18
8/17/2016	C1	1030	0.103		92	0.058	0	0	16
6/22/2016	C1	1450	0		79	0.069	0	0.437	2
4/28/2016	C1	1430	0.0445		56	0.019	0	0	4
2/17/2016	C1	1015	0.0963		54	0.0614	0	0	143
2/9/2017	C2	1130	0.081		66	0	0.075	0	548
6/22/2016	C2	915	0.151		85	0.021	0	0	117
4/28/2016	C2	925	0.108		61	0.0227	0.05	0	248
2/17/2016	C2	1215	0.0862		54	0.0411	0	0	308
2/9/2017	C5	1145	0.049		66	0.026	0.093	0	579
12/19/2016	C5	1045	0.03		135	0.013	0	0	219
10/31/2016	C5	1155	0		194	0	0	0	57
8/17/2016	C5	1105	0.098		123	0.049	0	0	238
6/22/2016	C5	940	0.162		90	0.074	0	0	
4/28/2016	C5	950	0.102		55	0.0374	0	0	291
2/17/2016	C5	1230	0.0806		57	0.0928	0	0	148
2/9/2017	C7	1200	0.091		76	0	0.096	0	548

Date	Site	Sample Time	Nitrate (mg/L)	Secchi Depth (ft.)	Specific Conductance (uS/cm)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)	Kjeldahl Nitrogen (mg/L)	E-Coli (MPN)
12/19/2016	C7	1105	0.101		94	0.036	0	0	1300
8/17/2016	C7	1120	0.118		84	0.015	0.054	0	58
6/22/2016	C7	950	0.203		76	0.025	0	0	291
4/28/2016	C7	1005	0.115		66	0.0208	0	0	162
2/17/2016	C7	1250	0.118		60	0	0	0	167
2/9/2017	C8	1210	0.128		78	0.021	0	0	345
12/19/2016	C8	1120	0.078		84	0.019	0.0871	0	649
10/31/2016	C8	1215	0.088		210	0	0.161	0	921
8/17/2016	C8	1135	0.093		143	0.069	0.098	0	40
6/22/2016	C8	1005	0.176		81	0.058	0	0	1203
4/28/2016	C8	1025	0.074		67	0.13	0	0	276
2/17/2016	C8	1300	0.101		60	0	0	0	461
2/9/2017	L1	955	0.123		81	0	0	0	6
12/20/2016	L1	1020			176				
12/19/2016	L1	915	0.061		158	0.037	0	0	7
10/31/2016	L1	1050	0	1.65	146	0	0	0	0
8/17/2016	L1	1405	0		94	0.06	0	0	2
6/22/2016	L1	1415	0		69	0.019	0	0	0
4/28/2016	L1	1405	0		52	0.0393	0	0	1
2/17/2016	L1	955	0.0989		49	0.0356	0	0	11
3/29/2017	L2	850		6.13	77				
3/15/2017	L2	1350		3.5	77				
3/1/2017	L2	935		4.45	76				
2/15/2017	L2	840		3.55	80				
2/9/2017	L2	1005	0.123		81	0	0	0	10
1/31/2017	L2	930		2.65	84				
1/10/2017	L2	1325		1.55	91.3				
12/28/2016	L2				167				
12/20/2016	L2	940		2.3	163				
12/19/2016	L2	905	0.063		162	0.023	0	0	10
11/15/2016	L2	955			159				
11/8/2016	L2	1030		1.55	155				
11/1/2016	L2	1115		1.95	152				
10/31/2016	L2	1050	0	1.8	148	0	0	0	17
10/24/2016	L2	1030		1.63	143				0
10/18/2016	L2	1020		2.23	137				
10/12/2016	L2	1030		1.65	128	0			
10/5/2016	L2	1130		1.9	121	0			
9/27/2016	L2	1130		2.35	117				0
9/20/2016	L2	1010		1.85	108				0
9/13/2016	L2	1030	0.1	2.6	103	0			0

Date	Site	Sample Time	Nitrate (mg/L)	Secchi Depth (ft.)	Specific Conductance (uS/cm)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)	Kjeldahl Nitrogen (mg/L)	E-Coli (MPN)
8/30/2016	L2	1115		3.45	95				230
8/17/2016	L2	1350	0		101	0	0.075	0	3
8/16/2016	L2	1010		3	96				
7/27/2016	L2	1010	0.06	3	87.5	0			
7/13/2016	L2	1045	0.1	3.95	76	0.01			
6/28/2016	L2	915	0.05	3.4	71	0			
6/22/2016	L2	1345	0		69	0.015	0	0	5
6/14/2016	L2	1135	0.13	4.45	67	0.04			0
6/1/2016	L2	1310		5.2	64				0
5/17/2016	L2	1200	0.14		59	0.04			0
5/4/2016	L2	850	0.05		55	0.0267			
4/28/2016	L2	1345	0		52	0.0264	0.0738	0	3
4/19/2016	L2	850			49				500
4/5/2016	L2	1010	0.0755		45	0			100
3/23/2016	L2				58				
3/22/2016	L2	1005	0		56	0.013			
3/9/2016	L2	1130			53				
3/1/2016	L2	935			52				
2/17/2016	L2	850	0.0996		49	0.0208	0	0	20
2/9/2016	L2	915			48				
1/12/2016	L2	1105			43.9				
2/9/2017	L5	1025	0.049		68	0	0	0	387
12/19/2016	L5	955	0.048		88	0.045	0	0.704	108
10/31/2016	L5	1250	0.041		84	0	0	0	10
8/17/2016	L5	1010	0.177		93	0.045	0	0	58
6/22/2016	L5	1430	0		82	0.045	0.0549	0	0
4/28/2016	L5	1420	0		57	0.043	0	0	9
2/17/2016	L5	1005	0.121		55	0.0448	0	0	461
2/9/2017	T11	1335	0.024		87	0.017	0	0	114
12/19/2016	T11	1300	0.032		166	0.025	0	0	186
10/31/2016	T11	1315	0		194	0	0	0	53
8/17/2016	T11	1325	0.08		120	0.03	0	0	33
6/22/2016	T11	1135	0.094		94	0.013	0	0	48
4/28/2016	T11	1140	0.0623		67	0.0319	0	0	160
2/17/2016	T11	1420	0.0462		57	0	0	0	214
2/9/2017	T12N	1255	0.238		156	0.085	0.191	0	0
12/19/2016	T12N	1210	0.368		196	0.172	0.226	0	0
10/31/2016	T12N	1325	0.16		206	0	0.258	0	0
8/17/2016	T12N	1250	0.069		176	0.187	0.215	0	37

Date	Site	Sample Time	Nitrate (mg/L)	Secchi Depth (ft.)	Specific Conductance (uS/cm)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)	Kjeldahl Nitrogen (mg/L)	E-Coli (MPN)
6/22/2016	T12N	1050	0.255		168	0.193	0.22	0	0
4/28/2016	T12N	1105	0.139		133	0.0818	0.0975	0	38
2/17/2016	T12N	1340	0.16		121	0.019	0	0	96
2/9/2017	T19	1310	0.078		104	0	0.075	0	121
12/19/2016	T19	1230	0		159	0.032	0.068	0	194
10/31/2016	T19	1345	0		130	0	0	0	33
8/17/2016	T19	1305	0.102		81	0.128	0	0	46
6/22/2016	T19	1110	0.125		94	0.052	0	0	47
4/28/2016	T19	1120	0.0561		94	0.0245	0.0518	0	276
2/17/2016	T19	1355	0.13		92	0.0264	0	0	135
2/9/2017	T22	1240	0.089		127	0.03	0.102	0	83
12/19/2016	T22	1150	0.172		164	0.098	0.118	0	72
10/31/2016	T22	1315	0.037		213	0	0.156	0	16
8/17/2016	T22	1235	0.068		168	0.097	0.104	0	816
6/22/2016	T22	1035	0.203		153	0.08	0.106	0	33
4/28/2016	T22	1050	0.0918		108	0.0522	0.0629	0	167
2/17/2016	T22	1330	0.106		90	0.0264	0	0	194
2/9/2017	T32	1045	0.035		61	0	0	0	579
12/19/2016	T32	1025	0.022		78	0.021	0.095	0	84
10/31/2016	T32	1215	0.027		104	0	0	0	73
8/17/2016	T32	1040	0.15		72	0.065	0	0	93
6/22/2016	T32	1500	0.161		70	0.026	0	0	111
4/28/2016	T32	1445	0.0607		58	0.0467	0	0	96
2/17/2016	T32	1020	0.0765		50	0.0541	0	0	157
2/9/2017	T34	1225	0.073		73	0	0	0	228
12/19/2016	T34	1420	0.095		76	0.026	0.0809	0	517
8/17/2016	T34	1150	0.101		81	0.052	0	0	40
6/22/2016	T34	1020	0.154		75	0.03	0	0	261
4/28/2016	T34	1035	0.0583		66	0.0282	0.0718	0	137
2/17/2016	T34	1315	0.0936		60	0.0633	0	0	141

APPENDIX G

ANNUAL STORMWATER SURVEY RESULTS

3/31/2017

2016/2017 SWMP SURVEY – RESULTS

City of Auburn

Water Resource Management Department | Watershed Division

Introduction:

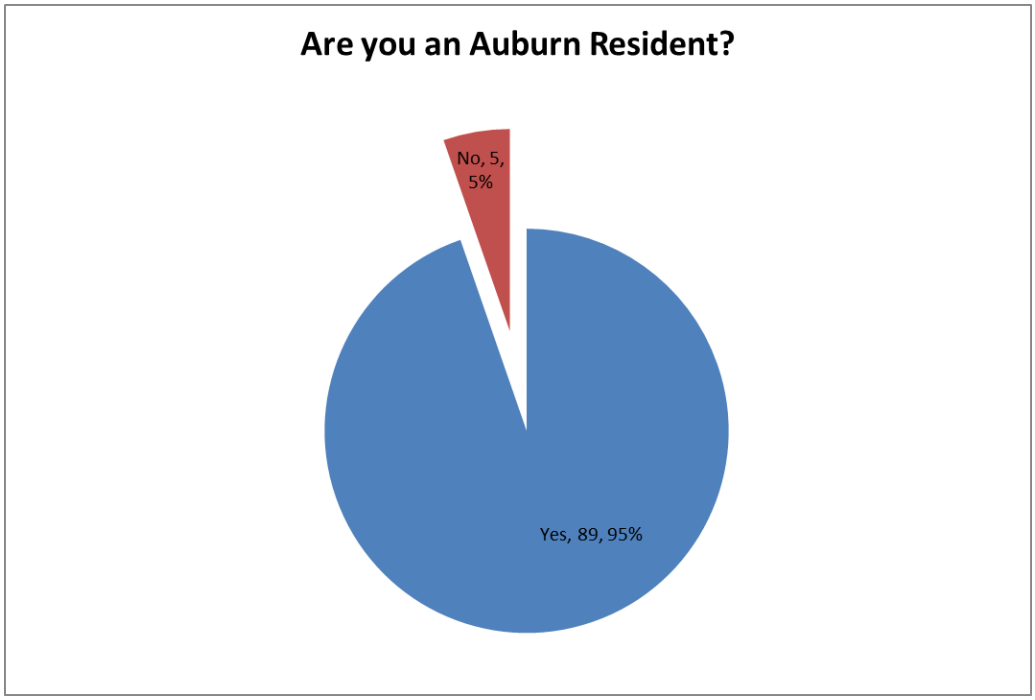
During the original development of the City of Auburn's (City) Stormwater Management Program (SWMP) the City sought public input through the limited distribution of a hardcopy survey questionnaire. The purpose of this survey was to 1) gage the level of awareness of the public regarding the City's SWMP, 2) to gather feedback regarding citizen interests and/or concerns related to stormwater and watershed management within the City, and 3) to allow the City an opportunity to tailor its SWMP and guiding Stormwater Management Program Plan (SWMPP) to address any areas for improvement, interests, or concerns identified through the survey. This survey was updated to a web-based survey in September of 2015 and distributed to a much larger portion of the citizen base via social media and digital press release. This survey was repeated during the current reporting year.

Press Release - http://www.auburnalabama.org/stormwater-management-plan-survey.html

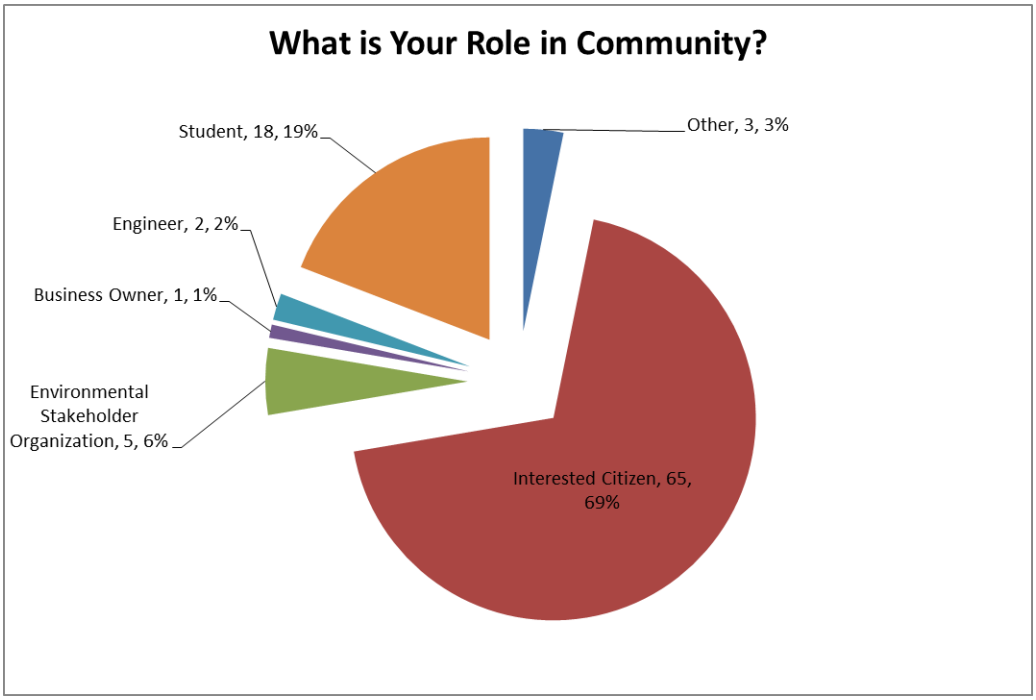
The results of this survey are summarized below. This survey will be reviewed, revised as necessary, and distributed annually to allow the City to better tailor its education and public involvement offerings based upon current citizen input. These survey results will help guide and improve the City's Public Education and Involvement Program over the coming years and will provide a necessary tool to measure the success of those offerings.

Disclaimer – This survey does not represent a statistically valid sample size of the population of Auburn, Alabama and the City of Auburn does not make any claim that these results are in any way reflective or representative of the community. Results are for general informational purposes only. Any unauthorized reuse of these data without permission is strictly prohibited.

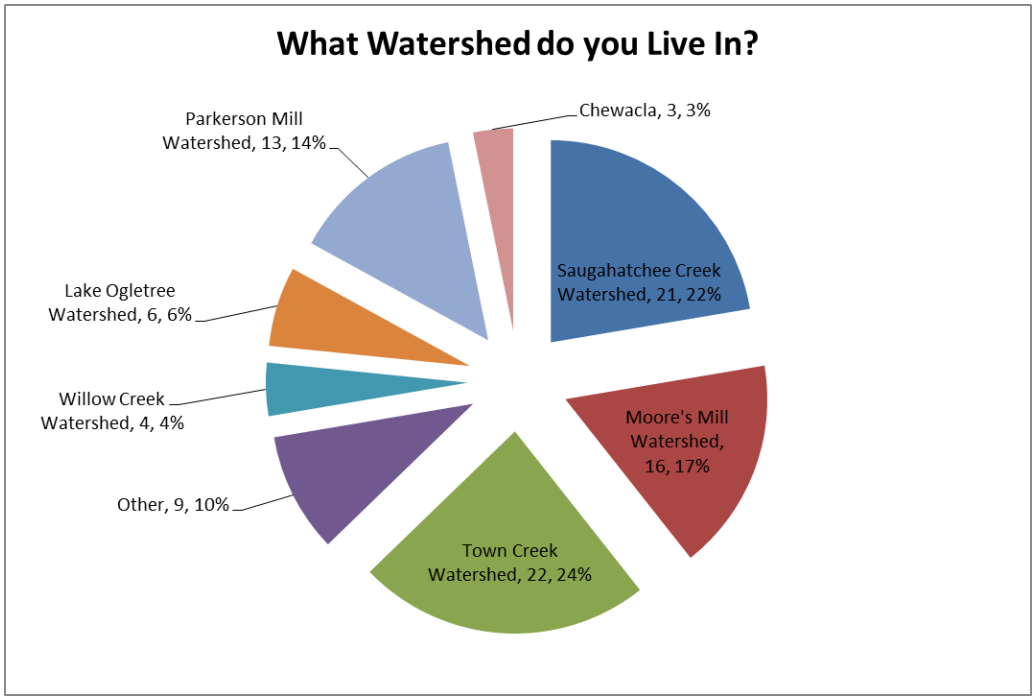
Question 1



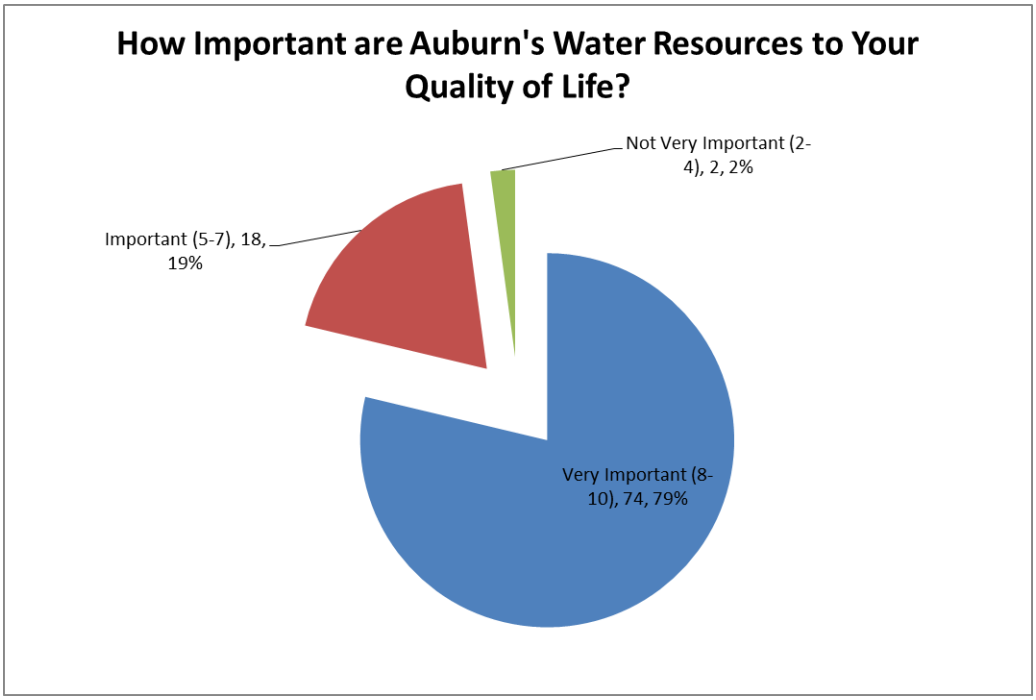
Question 2



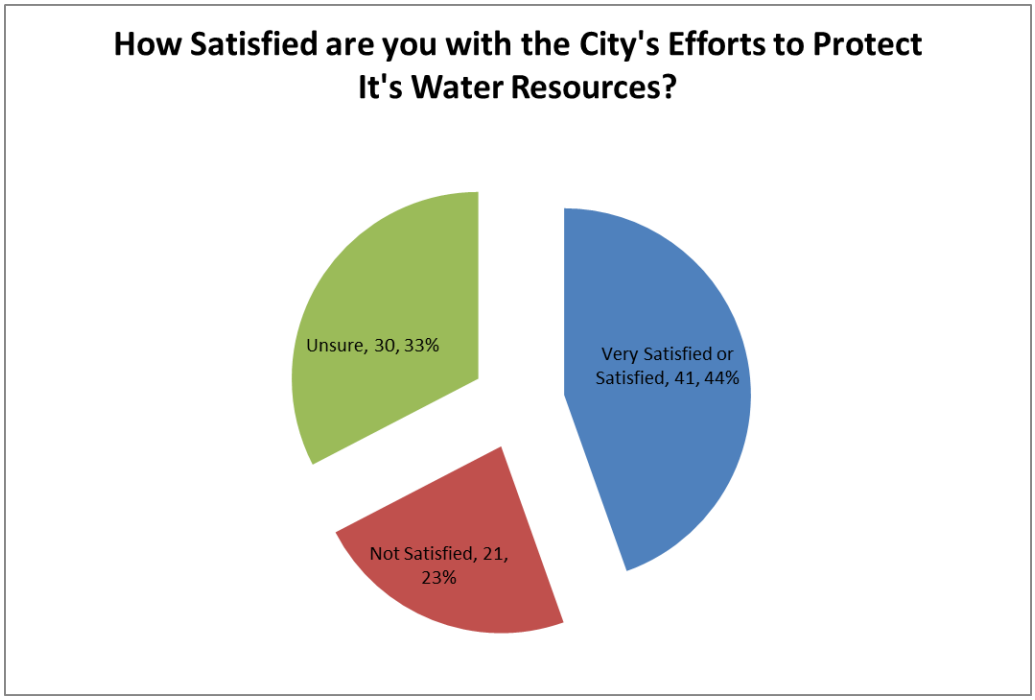
Question 3



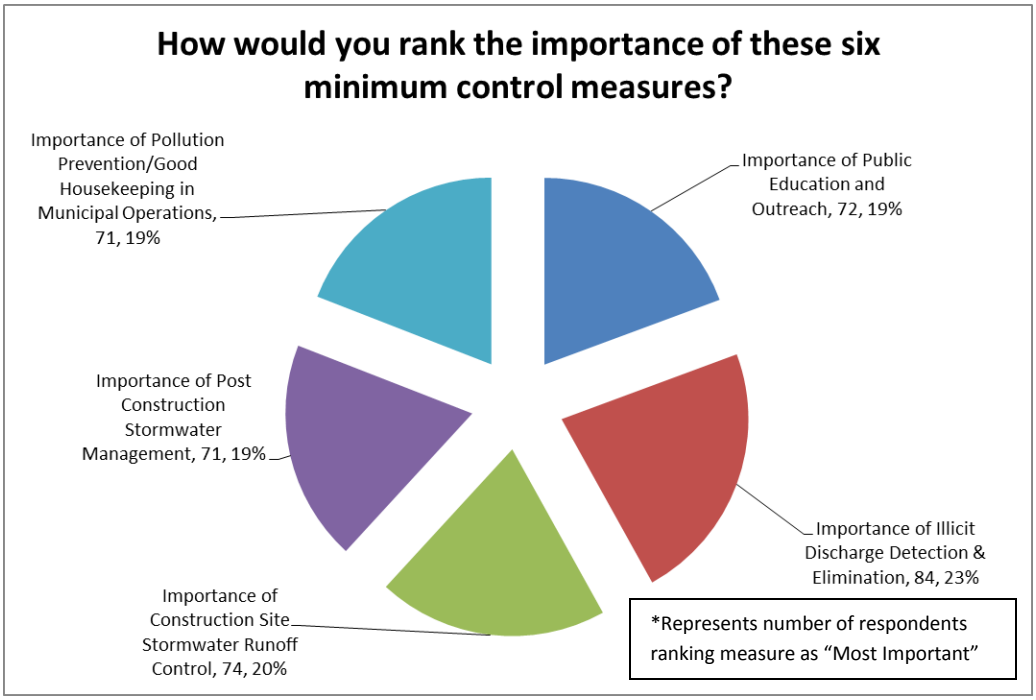
Question 4



Question 5



Question 6



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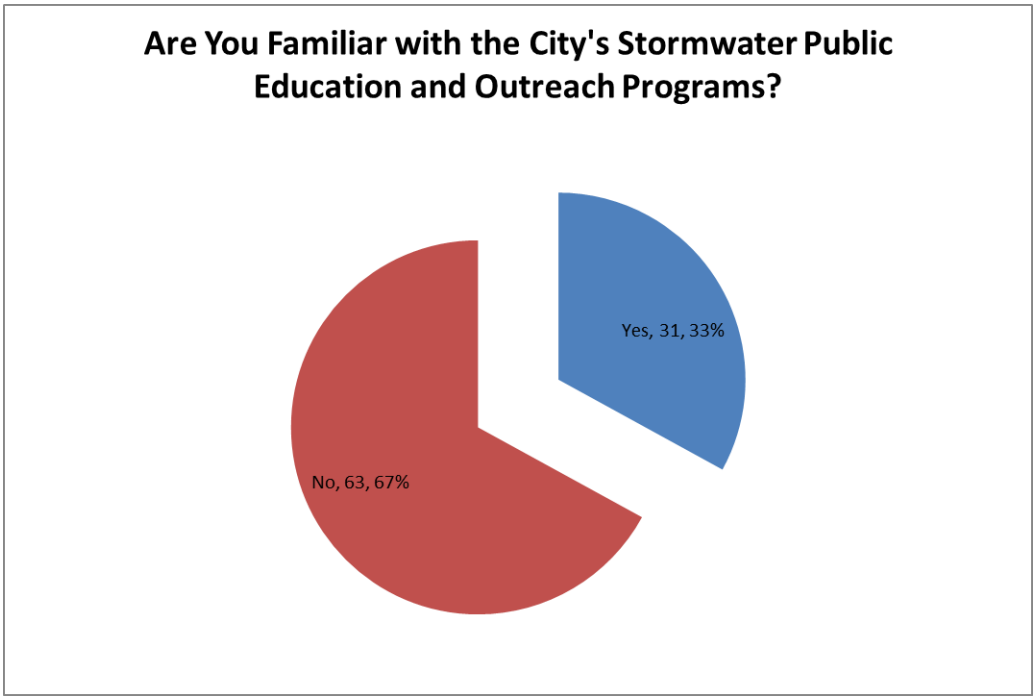
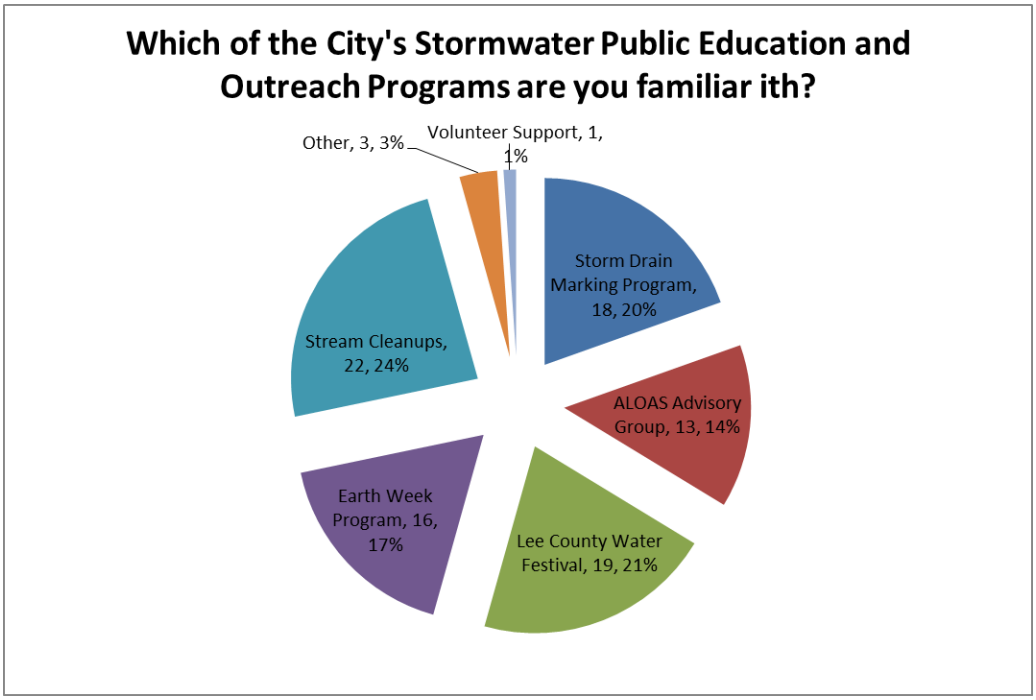
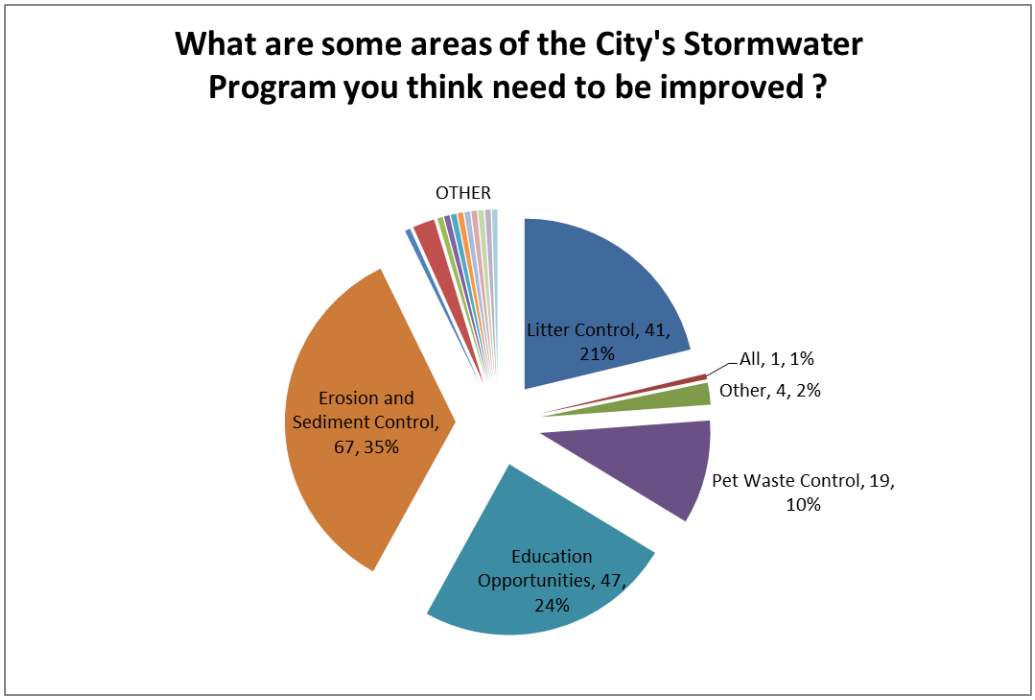


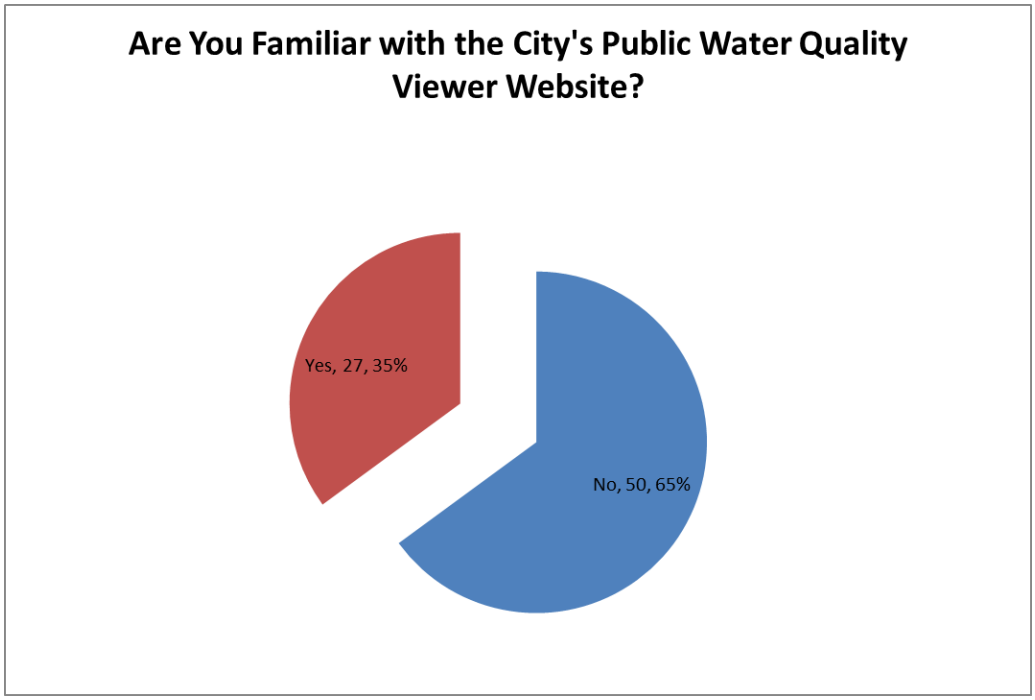
Question 8



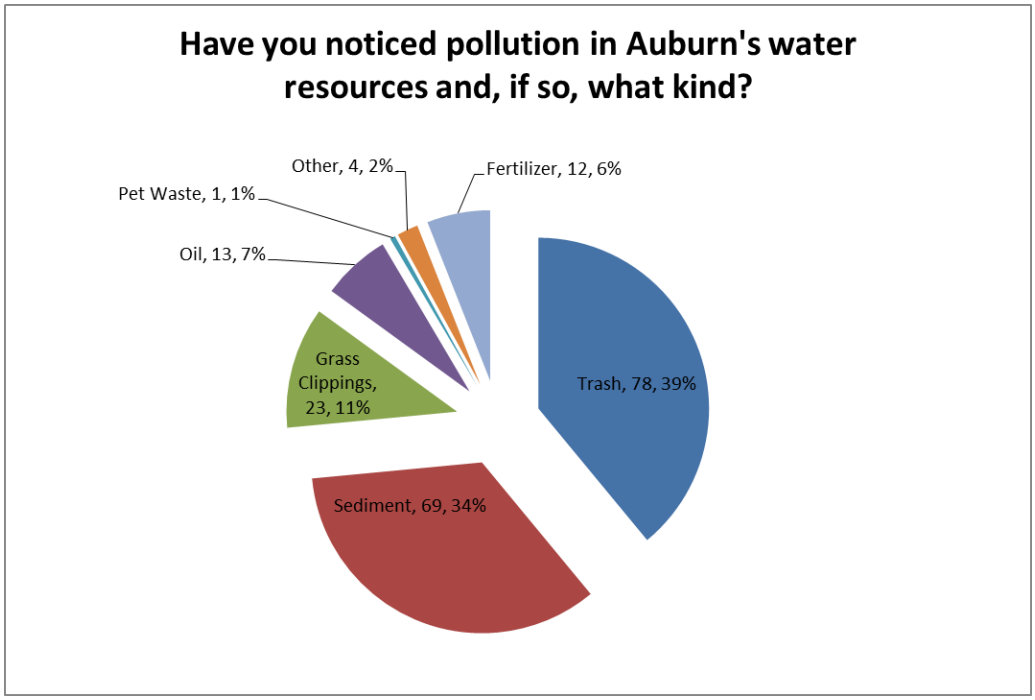
Question 9



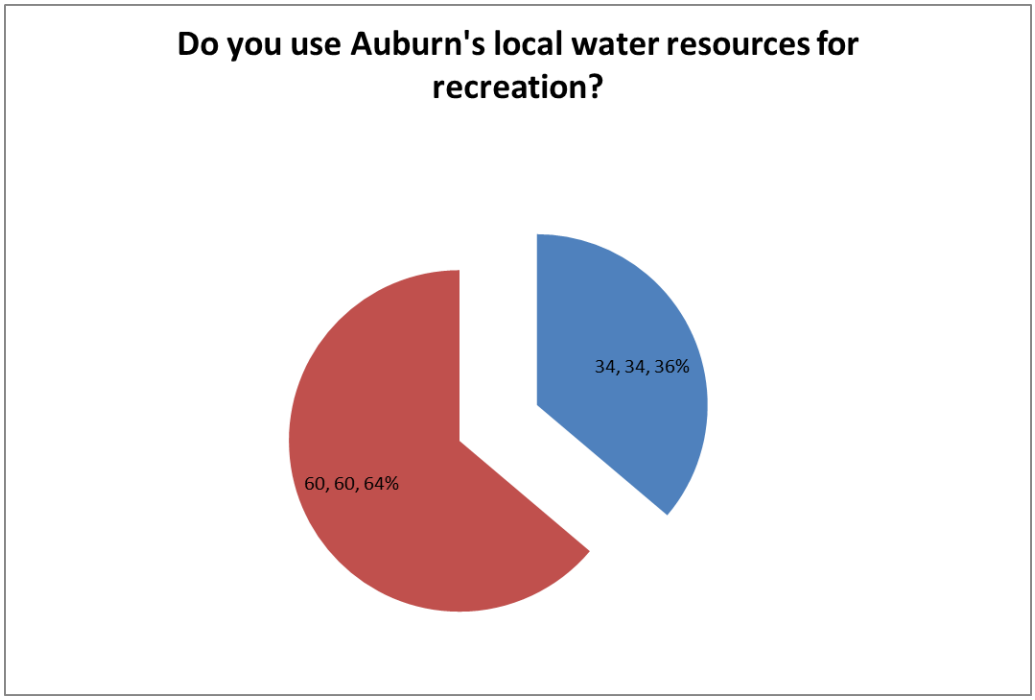
Question 10



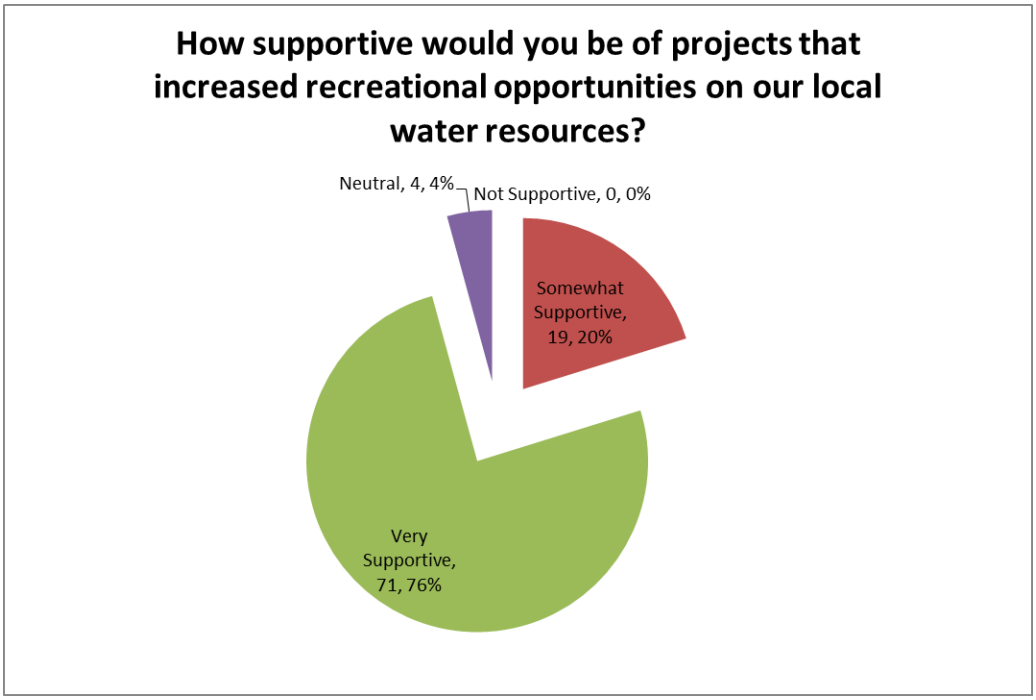
Question 11



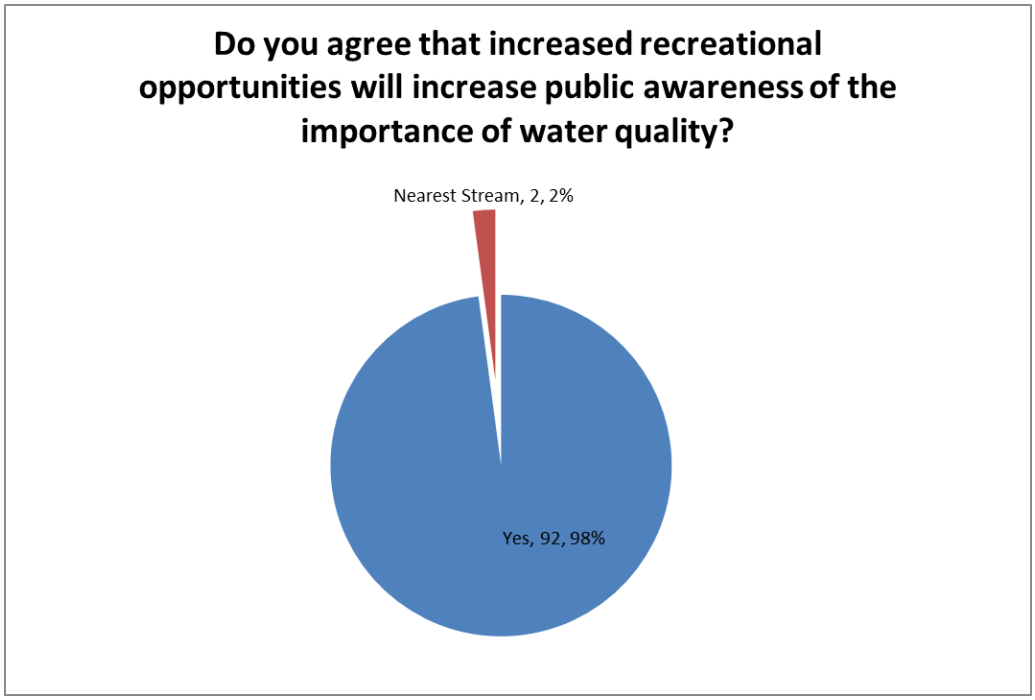
Question 12



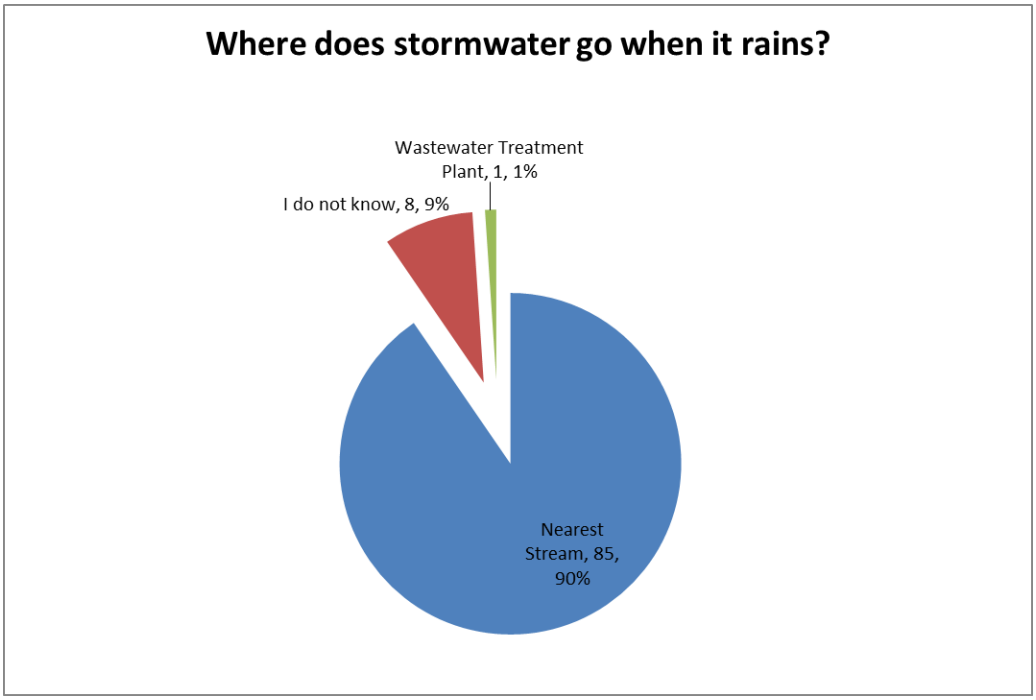
Question 13



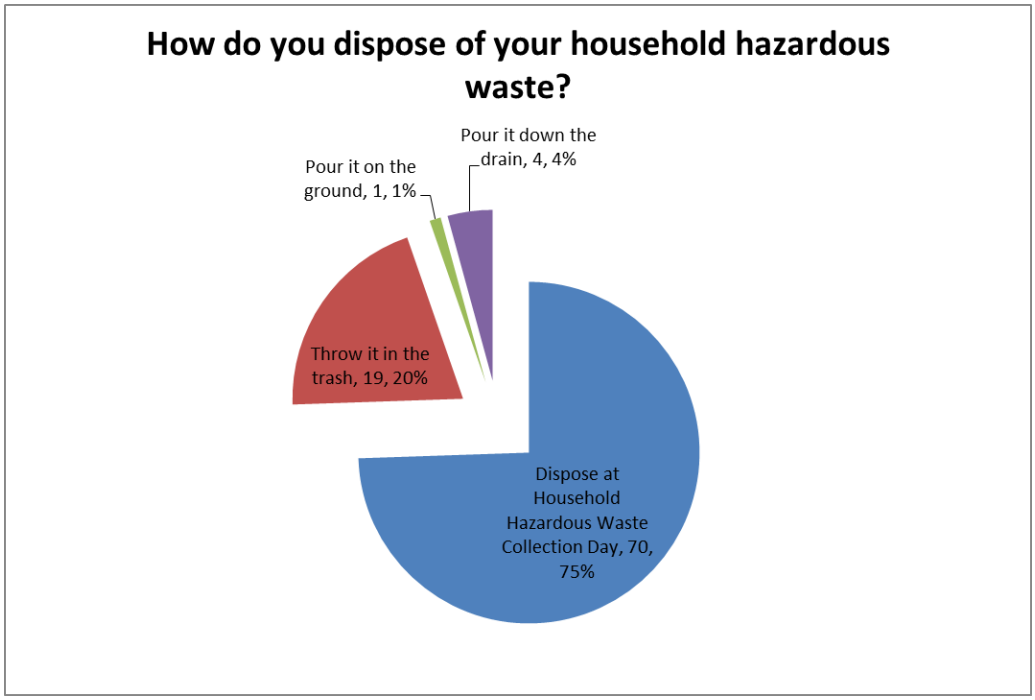
Question 14



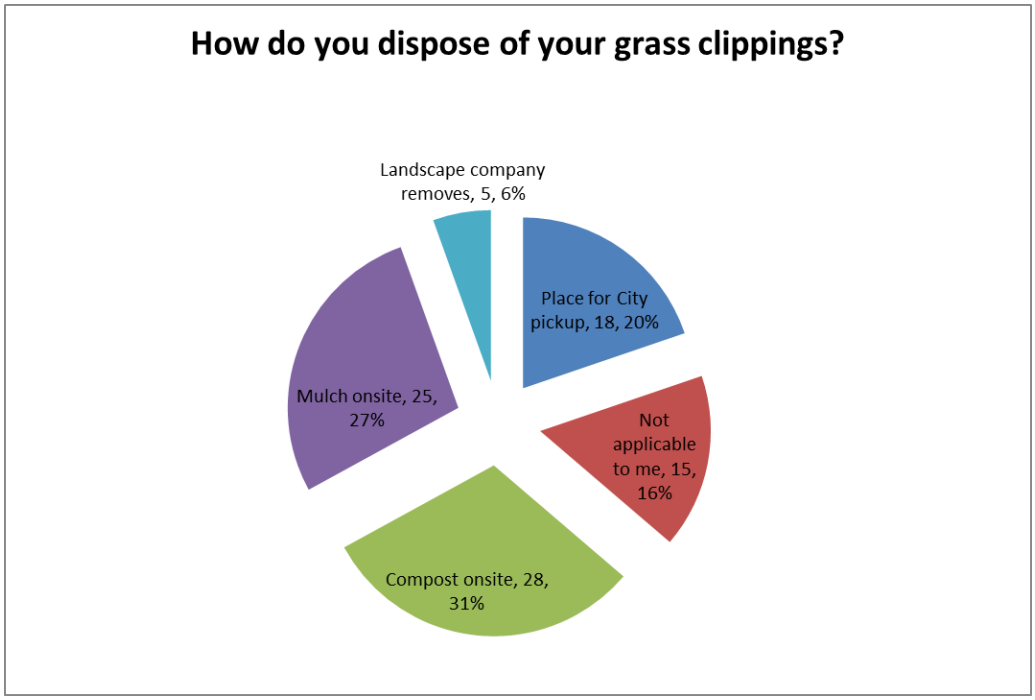
Question 15



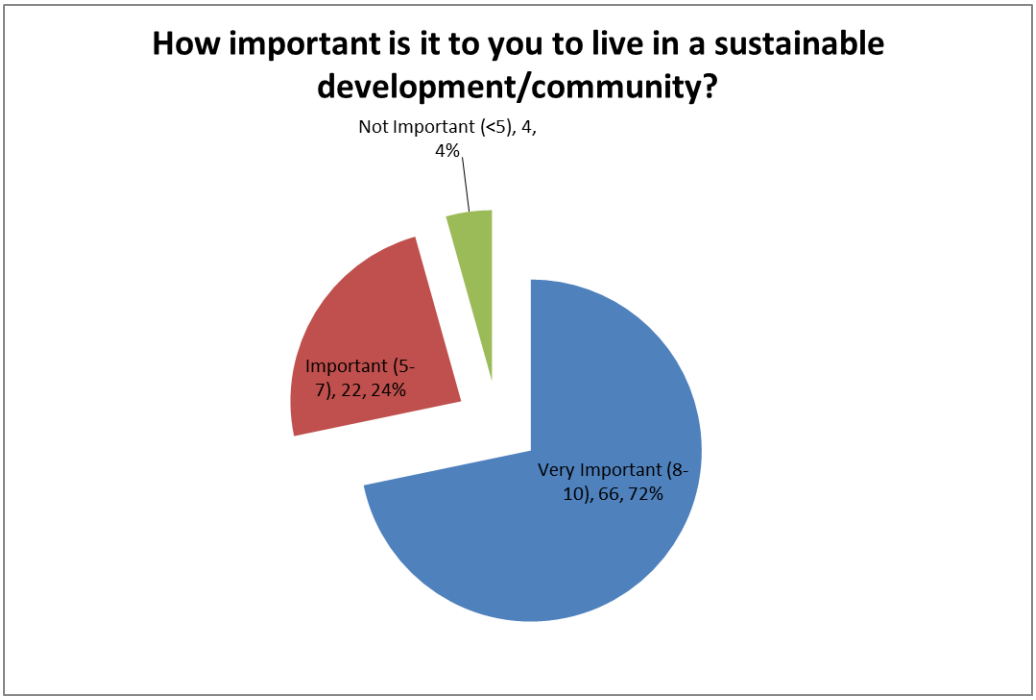
Question 16



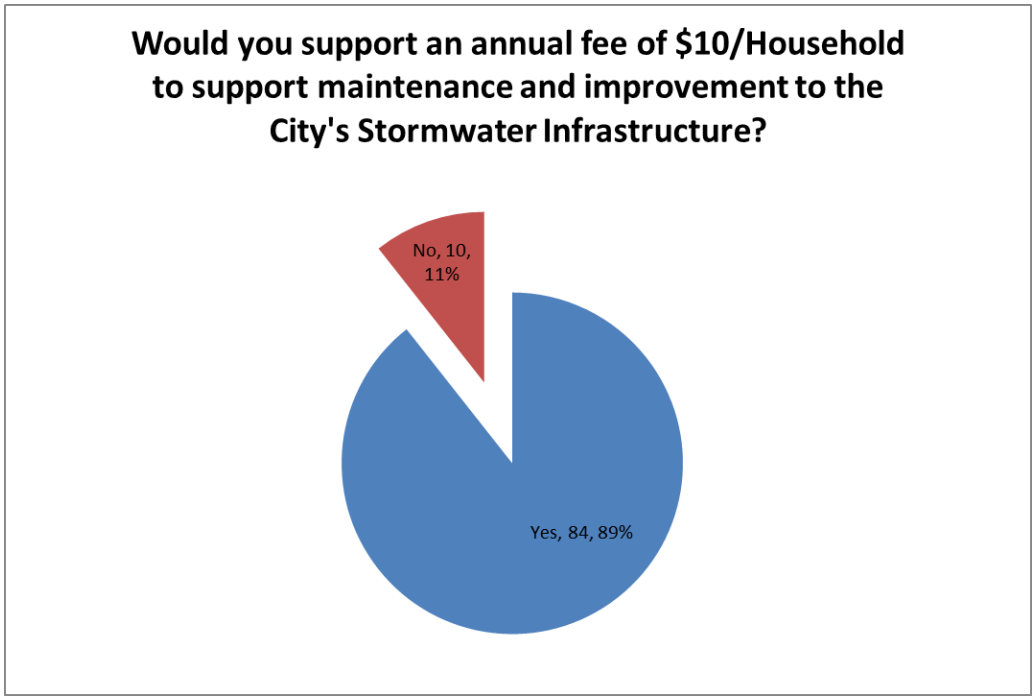
Question 17



Question 18



Question 19


Would you support an annual fee of $10/Household to support maintenance and improvement to the City's Stormwater Infrastructure?
No, 10, 11%
Yes, 84, 89%