

# Storm Water Management Program (SWMP)

Clemson University



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## 1.0 Introduction

### 1.1 Stormwater Background

Rainfall that runs across the surface of the ground, known as stormwater runoff, plays a major role in the health of waterways. In an undeveloped setting, a large portion of rainfall has the opportunity to infiltrate through the soil where it is filtered of potential pollutants before entering groundwater. As land development continues and natural pervious surfaces are converted to impervious, water has less opportunity to follow the natural infiltration process, and instead, a large fraction of rainfall is sent rushing across the surface of the ground eventually entering the surrounding waterbodies. As water travels across rooftops, agricultural fields, driveways, and other altered land uses, it picks up pollutants such as oil, grease, sediment, animal waste, fertilizer, etc. and carries them straight to our local waterbodies. In an effort to address and reduce the impairments of waterbodies due to stormwater runoff, Congress established the National Pollutant Discharge Elimination System (NPDES) Stormwater Program which regulates discharges to waterbodies.

### 1.2 NPDES Regulatory Requirements

The NPDES Stormwater Program addresses water pollution by regulating stormwater discharges from Municipal Separate Stormwater Sewer Systems (MS4s). In accordance with the definition of a small MS4 established by Congress, the 2010 Census established Clemson University as a small MS4 and therefore the University applied for coverage under the NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems (SMS4) (General Permit).

### 1.3 Mission Statement

This Stormwater Management Program (SWMP) was developed in accordance with the requirements of the General Permit. The goals of the SWMP are to reduce the non-point source pollutant discharges from the storm sewer system to the maximum extent practical, protect water quality, and satisfy the water quality requirements of the Clean Water Act. These goals will be accomplished through best management practices (BMPs) that are designed to address each of the six minimum control measures identified by the NPDES Program.

Clemson University is committed to achieving sustainability in all aspects of campus operations. This SWMP sets goals which meet or exceed the requirements of the General Permit. With implementation of this SWMP, Clemson University commits itself to ensuring the health of surrounding waterways for generations to come. Further design and implementation details regarding stormwater management at Clemson University can be found in *The Guidelines for Commission Architects and Engineers and Stormwater Planning & Management Policy: Policy 17*.

## 2.0 Definitions

Authorized Non-Stormwater Discharges – the following non-stormwater sources are authorized to be discharged to waters of the State or waters of the U.S. provided the Department has not determined these sources to be substantial contributors of pollutants to your SMS4:

- a) Water line flushing
- b) Landscape irrigation
- c) Diverted stream flows
- d) Rising ground waters
- e) 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.)
- f) Uncontaminated pumped ground water
- g) Discharges from potable water sources
- h) Foundation drains
- i) Air conditioning condensate
- j) Irrigation water (not consisting of treated, or untreated, waste water)
- k) Springs
- l) Water from crawl space pumps
- m) Footing drains
- n) Lawn watering
- o) Individual residential car washing
- p) Natural flows from riparian habitats and wetlands
- q) Dechlorinated swimming pool discharges
- r) Street wash water
- s) Discharges or flows from firefighting activities

Best management practices (BMPs) - refers to storm water pollution control measures designed to address each of the six minimum control measures identified in the General permit.

Illicit discharge - any discharge to the SMS4 that is not comprised of entirely stormwater or listed as an authorized non-stormwater discharge by the General Permit. Common sources of these discharges include leaking septic tanks, improper oil disposal, radiator flushing disposal, laundry wastewater outlets, or household cleaners being dumped into storm drains.

Low impact development (LID) - a strategy for stormwater management that mimics the natural hydrological system functions of discharge, frequency, recharge and volume.

Maximum Extent Practical (MEP) – the technology-based discharge standard for municipal separate storm water systems to reduce pollutants in storm water

discharges that was established by Section 402(p) of the Clean Water Act.

Minimum Control Measures (MCM(s)) - SCDHEC requires six minimum control measures (MCMs) be incorporated into the stormwater management program of a small municipal separate storm sewer system (SMS4). These measures include:

- 1) Public education and outreach
- 2) Public participation / involvement
- 3) Illicit discharge, detection and elimination
- 4) Construction site runoff control
- 5) Post-construction runoff control
- 6) Pollution prevention / good housekeeping

Outfall- the point where a municipal separate storm sewer discharges to waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.

Pollutants of Concerns (POC(s)) - a pollutant that is reasonably expected to be present in a discharge based on the source and nature of the discharge.

Small Municipal Separate Storm Sewer System (SMS4) - all small separate storm sewer systems 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, that discharge to waters of the United States, but are not defined as “large” or “medium” municipal separate storm sewer systems. The designation of large, medium, or small is based on urbanized areas as determined by the latest census.

South Carolina Department of Health and Environmental Control (SCDHEC) - State Agency that promulgates the Environmental Protection Agencies (EPA) program allowing the discharge of stormwater to Waters of the State (WoS). SCDHEC grants certificate of coverage to SMS4 and regulates allowable quantity and quality of stormwater released to WoS.

Waters of South Carolina, or Waters of the State - lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial limits of the State, and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction and all waters of the United States within the political boundaries of the State of South Carolina. Waste treatment systems, including treatment ponds or lagoons designed to

meet the requirements of CWA are not waters of South Carolina. This exclusion applies only to manmade bodies of water, which neither were originally created in waters of South Carolina (such as disposal areas in wetlands) nor resulted from the impoundment of waters of South Carolina.

Waters of the United States, or Waters of the U.S. –

- (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters, which are subject to the ebb and flow of the tide
- (b) All interstate waters, including interstate "wetlands";
- (c) All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, wet meadows, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
  - (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes
  - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - (3) Which are used or could be used for industrial purposes by industries in interstate commerce
- (d) All impoundments of waters otherwise defined as waters of South Carolina under this definition;
- (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

### **3.0 Legal Authority for Implementation and Enforcement**

#### **3.1 Legal Authority**

Clemson University is a state-funded university and the legal owner of the property within its designated SMS4 jurisdiction. As set forth in more detail in the Enforcement Response Plan (ERP), Clemson University Facilities has entered into a memorandum of understanding with Pickens County whereby Pickens County will implement and enforce the Sections 4.2.4 and 4.2.5 of the General Permit (Construction Activities Permitting Program), including the imposition of civil and criminal penalties for violations of the Construction Activities Permitting Program. With respect to other enforcement issues related to illicit discharges/illicit connections and maintenance of permanent stormwater management requirements, Clemson University will enforce compliance with these requirements through internal procedures to address violations by University faculty, staff, or students and through contractual provisions to address violations by contractors, vendors, and tenants. Additionally, as legal owner of the property within its SMS4 jurisdiction, the University has responsibility for and control over the storm water

management facilities subject to the requirements of the General Permit. Clemson University therefore possesses adequate legal authority to control pollutant discharges into and from the University SMS4 and to meet the requirements of the General Permit.

### **3.2 Collaboration**

As described above, Clemson University has entered into a memorandum of understanding with Pickens County whereby the County will assist Clemson University Facilities in satisfying the Construction Site Runoff Control and Post-Construction Site Runoff Control MCMs (MCMs 4 & 5). Similarly, through a memorandum of understanding, Carolina Clear will assist Clemson University Facilities in satisfying the Public Education and Outreach and Public Involvement/Participation Minimum Control Measures (MCMs 1 & 2).

### **3.3 Enforcement Measures and Tracking**

The ERP developed by Clemson University sets the University's potential responses to violations and addresses repeat and continuing violations through progressively stricter responses. This document is to be referred to for guidance in instances of non-compliance (see Appendix E). Record of all violations shall be tracked electronically by Clemson University.

#### **4.0 Minimum Control Measures**

Regulated SMS4s are required to incorporate six minimum control measures into their SWMP. These measures are intended to guide municipalities in establishing a successful stormwater program. The six minimum control measures are:

1. Public education and outreach
2. Public participation/involvement
3. Illicit discharge detection and elimination
4. Construction site runoff control
5. Post-construction site runoff control
6. Pollution prevention/good housekeeping

Each of these MCM's are addressed to their full extent according to the SMS4 Permit requirements and outlined in sections 4.1-4.6 of this document.

### **4.1 Public Education and Outreach**

#### **4.1.a. Overview**

The goal of the Public Education and Outreach MCM is to connect with individuals of the Clemson University community to inform them of the impacts they can have on stormwater runoff. Ultimately, sustained behavioral changes as an effect of increased environmental awareness is strived for in the Clemson University community.

Through a Memorandum of Understanding (MOU) with Carolina Clear, Carolina Clear will be assisting Clemson University in fulfilling the General Permit requirements for this



minimum control measure. Through their regional stormwater program, Carolina Clear has previously developed a number of public education initiatives which will be implemented and expanded upon in the Clemson University SMS4.

#### **4.1.b. Identification of Clemson University POC's**

The following three pollutants have been identified as POCs in the Clemson University SMS4:

1. Sediment
2. Fats, Oils, and Grease (FOGs)
3. Litter

#### **4.1.c. Explanation of POC Selection**

Justification for these POCs has been developed as follows:

1. Sediment - Loss of sediment to stormwater infrastructure, local streams, and on-campus ponds is a maintenance and water quality concern. Sediment particles may include adsorbed nutrients, metals, and provide a breeding ground for bacteria.
2. FOGs - Fats, oils, and grease (FOGs) have been an identified concern due to the number of housing units, changing student population, numerous kitchens, and other on campus events that may include the use and disposal of FOGs.
3. Litter - Major events on campus that include sporting events, fairs, and festivals draw together students and visitors and result in increased litter.

#### **4.1.d. Identification of Target Audience**

The target audiences for the each of the POCs have been identified as follows:

1. Sediment Loss and Erosion Control – contractors, grounds maintenance
2. Fats, Oils, and Grease and their proper disposal – faculty/staff, students
3. Litter – faculty/staff, students

#### **4.1.e. BMPs to be Implemented Moving Forward**

The following BMPs have been developed in accordance with the requirements of the General Permit and will be implemented in the Clemson University SMS4 by Carolina Clear.

**BMP:** Carolina Clear will implement the objectives outlined below to address each of the identified pollutants of concern (POCs). Many of these objectives are already being pursued through the Carolina Clear program.

**Measurable Goal:** Achieve short and long term goals through the listed activities for each objective identified.

**Schedule:** To begin March 1, 2017

**Responsible Party:** Carolina Clear

<b>POC 1 - Sediment Loss and Erosion Control</b>			
<b>Objective</b>	<b>Activities in Support of Objective</b>	<b>Short-Term Goal</b>	<b>Long-Term Goal</b>
Manage sediment loss through the use of low impact development practices that decrease erosive conditions and encourage infiltration.	<ul style="list-style-type: none"> <li>• Host rain garden workshops</li> <li>• Demonstrate LID and include signage</li> <li>• Host workshops on LID design considerations</li> <li>• Market and distribute the new Carolina Clear Rain Garden Manual for SC Homeowners</li> <li>• Market resources available to professionals on rain garden design, construction, signage, and use.</li> </ul>	<p>Increase awareness of stormwater pollution and participation in its prevention for students, staff, faculty, and visitors at Clemson University.</p> <p>Decrease the likelihood and occurrence of erosive conditions and soil loss.</p> <p>Increase the likelihood of lot scale stormwater management and utilization of green infrastructure.</p>	Demonstrate sustained behavior change towards pollutant minimization through involving faculty and staff. Implement and follow through with meaningful policy changes that protect waterways and elevate Clemson University to a model campus and SMS4 environment.
Provide information on the importance of dry detention pond maintenance to appropriate University personnel.	<ul style="list-style-type: none"> <li>• Develop a handout on detention pond maintenance.</li> </ul>	Increase awareness of pollutants of concern, regulations and best management practices.	Ensure detention ponds on campus continue to function properly through regular maintenance.
Provide opportunities for building and buying rain barrels to reduce erosive	<ul style="list-style-type: none"> <li>• Host a rain barrel sale</li> <li>• Engage students in painting rain barrels for art</li> </ul>	Increase awareness of pollutants of concern, regulations and	Demonstrate sustained behavior change towards pollutant minimization.

conditions in predominantly residential or housing areas.	projects and installing them at high visibility locations	best management practices.  Host one rain barrel sale per year on Clemson University's campus.	Reduce stormwater volumes through rainwater harvesting and reuse.
Hold workshops and informational sessions about low maintenance and river-friendly landscape practices.	<ul style="list-style-type: none"> <li>• Host green gardening series under "Carolina Yards" program</li> <li>• Market and assist in the facilitation of the Carolina Yards Online Course</li> </ul>	Increase awareness of pollutants of concern, regulations, and best practices for homeowners.	<p>Demonstrate sustained behavior change towards pollutant minimization.</p> <p>Work with campus and student groups to become a demonstration grounds of these best landscaping practices.</p>
Provide outreach on priority stormwater pollutants and behaviors to all incoming students during orientation.	<ul style="list-style-type: none"> <li>• Develop and distribute information to incoming students during orientation.</li> </ul>	Increase awareness of pollutants of concern, regulations, and best practices for student body at Clemson University.	Create an increasingly more informed graduate class in the topics of stormwater, watershed management, and pollution prevention.

**POC 2 - Fats, Oils, and Grease and their proper disposal**

<b>Objective</b>	<b>Activities in Support of Objective</b>	<b>Short-Term Goal</b>	<b>Long-Term Goal</b>
Provide outreach regarding better management of kitchen FOGs byproducts.	<ul style="list-style-type: none"> <li>• Present FOG information to restaurants and dining areas</li> <li>• Distribute FOG informative packets to restaurants and dining areas</li> </ul>	Increase awareness of pollutants of concern, regulations, and best practices	<p>Demonstrate sustained behavior change towards pollutant minimization.</p> <p>Observe less frequency of FOG backups</p>

	<ul style="list-style-type: none"> <li>Engage students in storm drain marking and painting, and overall, awareness of sewer overflows and who to call when these occur</li> </ul>		
Provide outreach on priority stormwater pollutants and behaviors to all incoming students during orientation.	<ul style="list-style-type: none"> <li>Develop and distribute information to incoming students during orientation.</li> </ul>	Increase awareness of pollutants of concern, regulations, and best practices for student body at Clemson University.	Create an increasingly more informed graduate class in the topics of stormwater, watershed management, and pollution prevention.
<b>POC 3 - Litter</b>			
<b><i>Objective</i></b>	<b><i>Activities in Support of Objective</i></b>	<b><i>Short-Term Goal</i></b>	<b><i>Long-Term Goal</i></b>
Provide outreach to increase awareness of litter.	<ul style="list-style-type: none"> <li>Encourage and support recycling initiatives</li> </ul>	Increase awareness of concern, regulations, and best practices	Demonstrate sustained behavior change towards pollutant minimization.
Provide outreach on priority stormwater pollutants and behaviors to all incoming students during orientation.	<ul style="list-style-type: none"> <li>Develop and distribute information to incoming students during orientation.</li> </ul>	Increase awareness of concern, regulations, and best practices for student body at Clemson University.	Create an increasingly more informed graduate class in the topics of stormwater, watershed management, and pollution prevention.

<p>Provide involvement opportunities to reduce the amount of litter.</p>	<ul style="list-style-type: none"> <li>• Host litter pick-ups</li> </ul>	<p>Increase awareness of concern, regulations, and best practices</p> <p>Host one campus wide litter pick-up each year</p> <p>Target best locations and bin types or arrangements to decrease litter and improve trash clean up and recycling efficiency.</p>	<p>Demonstrate sustained behavior change and a reduction of litter within the SMS4 area.</p>
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**BMP:** Carolina Clear will publicize the educational message, “*Only Rain Down the Drain*” through educational presentations to student clubs, booths at fairs/festivals, and distribution of promotional items such as pens and cozies.

**Measurable Goal:** Carolina Clear will have a presence at club meetings and fairs/festivals on campus. Promotional items will be distributed.

**Schedule:** Effort is ongoing

**Responsible Party:** Carolina Clear

**BMP:** Carolina Clear will publicize the educational message, “*Tigers Only Swim in Clean Water*” through educational storm drain markers placed throughout campus.

**Measurable Goal:** Install storm drain markers to highly visible storm drains on campus.

**Schedule:** Effort is ongoing

**Responsible Party:** Carolina Clear

**BMP:** Carolina Clear will publicize the educational message, “*Healthy Landscape Practices Result in Healthier Waterways*” through workshops, presentations, and educational booths.

**Measurable Goal:** Carolina Clear will have a presence at club meetings and fairs/festivals on campus. On-campus workshops will be hosted.

**Schedule:** To begin March 1, 2017

**Responsible Party:** Carolina Clear

**BMP:** Carolina Clear will publicize the educational message, “*Can the Grease, It Clogs Drains*” by distributing informative packets to restaurants/dining areas on campus which include posters, stickers, and magnets with information on FOG and its proper disposal. All elements within the packets are to be hung within the kitchen areas for all employees to see. FOG lids are also used as giveaways to individuals during fairs and festivals.

**Measurable Goal:** Carolina Clear will distribute FOG packets to all dining facilities in the Clemson SMS4. FOG lids will be distributed at festivals/fairs on campus.

**Schedule:** To begin March 1, 2017

**Responsible Party:** Carolina Clear

**BMP:** Carolina Clear will utilize the existing “custormwater” Instagram account and “Anderson and Pickens County Stormwater Partners” Facebook page for communication with the Clemson University community. These accounts will serve as a media to share upcoming public education/outreach events occurring in the Clemson University SMS4, as well as provide a space for students/citizens to share their input, questions, or comments with Carolina Clear.

**Measurable Goal:** Carolina Clear will utilize a Facebook and Instagram account to inform Clemson University students about stormwater related events.

**Schedule:** Effort is ongoing

**Responsible Party:** Carolina Clear

**BMP:** A survey previously developed to evaluate overall awareness of stormwater issues and the best way to reach Clemson University students will continue to be administered to different student clubs and groups via iClicker technology. The results will be analyzed to tailor educational programs to have the greatest impact possible on students.

**Measurable Goal:** Carolina Clear will administer and analyze the stormwater survey on Clemson University’s campus.

**Schedule:** To begin March 1, 2017

**Responsible Party:** Carolina Clear

**BMP:** A brief introduction to stormwater and how we impact it will be added to the CU1000 curriculum for incoming freshmen.

**Measurable Goal:** Stormwater education added to the CU1000 curriculum.

**Schedule:** To begin Fall Semester 2018. Effort is ongoing. Success has been limited to online orientation. Continuing to work with admissions to get include in CU1000 curriculum.

**Responsible Party:** Carolina Clear

## **4.2 Public Participation/Involvement**

### **4.2.a. Overview**

The goal of the Public Involvement and Participation MCM is to encourage public involvement in activities related to stormwater pollution prevention. These activities will be developed to be suitable for the target audiences identified in MCM 1.

Through a Memorandum of Understanding with Carolina Clear, Carolina Clear will be assisting Clemson University in fulfilling the General Permit requirements for this minimum control measure. Through their regional stormwater program, Carolina Clear has previously developed a number of public involvement activities which will be adapted and expanded upon to meet the needs of the Clemson University SMS4.

### **4.2.b. Opportunities for Participation in Stormwater Activities**

**BMP:** Establish three student intern projects per year that involve stormwater pollution prevention.

**Measurable Goal:** Three intern projects per year.

**Schedule:** Ongoing effort between University Facilities and Carolina Clear.

**Responsible Party:** Carolina Clear

**BMP:** Provide opportunities for students to participate in litter pick-ups twice a year.

**Measurable Goal:** Organize two litter clean up events per year.

**Schedule:** Effort is ongoing.

**Responsible Party:** Carolina Clear

**BMP:** Host an annual rain barrel sale for students/faculty.

**Measurable Goal:** Organize a rain barrel sale each year.

**Schedule:** To begin May 1, 2017. Effort is ongoing.

**Responsible Party:** Carolina Clear

**BMP:** Carolina Clear will provide opportunities for students to participate in marking storm drains with the "Tigers Only Swim in Clean Water" decal.

**Measurable Goal:** Storm drains displaying these decals will increase each year through student installation until all desired drains have been marked or available decals are exhausted.

**Schedule:** Effort is ongoing.

**Responsible Party:** Carolina Clear

#### ***4.2.c. Availability of SWMP Information to the Public***

**BMP:** Clemson University will post the SWMP to the University website for ease of public access.

**Measurable Goal:** SWMP will be posted online.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

### **4.3 Illicit Discharge Detection and Elimination**

#### ***4.3.a. Overview***

An “illicit discharge” is defined as any discharge that is not comprised entirely of stormwater or listed as an authorized non-stormwater discharge by the NPDES General Permit for Storm Water Discharges from Regulated SMS4. Common sources of these discharges include leaking septic tanks, improper oil disposal, radiator flushing disposal, laundry wastewater outlets, or household cleaners being dumped into storm drains. These discharges are considered toxic to natural waterways and require further treatment before being released. Stormwater systems do not provide any treatment to water before releasing it and therefore are not appropriate for conveying these discharges.

Improvements to efforts Clemson is already making to eliminate illicit discharge will be made through implementation of BMPs with measurable goals as guided by the requirements of the *NPDES General Permit for Stormwater Discharges from Regulated SMS4*.

#### ***4.3.b. Development of the Stormwater System Map***

**BMP:** Develop a storm system map which includes all University owned outfall locations and names/locations of Waters of the US that receive discharge from these outfalls. The data collected will be incorporated into the electronic “Clemson University Atlas” for ease of use.

**Measurable Goal:** Produce a map which contains 100% of University owned outfalls and corresponding receiving Waters of the U.S. by March 1, 2018.

**Schedule:** Effort is ongoing. Outfalls added upon completion of project.



**Responsible Party:** Clemson University Facilities

**BMP:** Develop a storm system map in Arc GIS which includes all University owned outfall locations and names/locations of Waters of the US that receive discharge from these outfalls.

**Measurable Goal:** Establish a map in Arc GIS for storm system mapping which contains 100% of University owned outfalls, all discharge points, and corresponding receiving Waters of the U.S. by March 1, 2018.

**Schedule:** Ongoing. Effort is ongoing. All discharge points noted.

**Responsible Party:** Clemson University Facilities

#### ***4.3.c. Identification of Priority Areas***

**BMP:** Develop a written list and map of priority areas by March 1, 2017 which will be updated annually.

**Measurable Goal:** Written list and map to be produced by March 1, 2017.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

#### ***4.3.d. Detection of Illicit Discharges***

**BMP:** Develop and implement a written IDDE Program for detecting and eliminating an illicit discharge. Program to include procedures for conducting field screening and investigating and correcting discovered illicit discharges.

**Measurable Goal:** Developed and implemented by March 1, 2017.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

#### ***4.3.e. Procedure for Conducting Field Screening***

**BMP:** Identify locations where screening will be performed which will reflect water quality concerns to the MEP and protect water quality by March 1, 2017.

**Measurable Goal:** Locations must be identified by March 1, 2017.

**Schedule:** Ongoing and continual effort.

**Responsible Party:** Clemson University Facilities

**BMP:** Develop a schedule for conducting screening. Schedule to begin March 1, 2017.

**Measurable Goal:** Schedule set and screening to begin by March 1, 2017

**Schedule:** To begin March 1, 2017

**Responsible Party:** Clemson University Facilities

**BMP:** Develop a written procedure for conducting field screening. This procedure is to include methods/equipment to be used and initial response to observation of an illicit discharge. This procedure should be established by March 1, 2017.

**Measurable Goal:** Procedure must be written by March 1, 2017.

**Schedule:** March 1, 2017

**Responsible Party:** Clemson University Facilities

**BMP:** Evaluate the effectiveness of field screening in reducing the introduction of pollutants to stormwater to the MEP by the 3<sup>rd</sup> Annual Report.

**Measurable Goal:** Evaluation performed and documented in the 3<sup>rd</sup> Annual Report.

**Schedule:** Evaluation of MS4 effectiveness is ongoing and evaluated to determine program effectiveness. Improvements to the program are always being implemented.

**Responsible Party:** Clemson University Facilities

#### **4.3.f. Addressing an Illicit Discharge**

##### 4.3.f.i. Investigation of the Source of an Illicit Discharge

**BMP:** Develop a written procedure for investigation of the source of illicit discharges which meets the minimum requirements identified in section 4.2.3.2.6 of the NPDES General Permit for Storm Water Discharges from Regulated SMS4 by March 1, 2017. Technology and methodology used must be specified.

**Measurable Goal:** Written procedures produced by March 1, 2017

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

##### 4.3.f.ii. Corrective Action for Illicit Discharge Elimination

**BMP:** Develop a written procedure that is compliant with section 4.2.3.2.7 of the NPDES General Permit for Storm Water Discharges from Regulated SMS4. This procedure must outline the timeframe by which corrective action must be taken as well as the follow-up investigations that shall take place to confirm elimination of an illicit discharge.

**Measurable Goal:** Written procedures produced by March 1, 2017

**Schedule:** March 1, 2017

**Responsible Party:** Clemson University Facilities

#### **4.3.g. Public Reporting Mechanism**

**BMP:** Establish a system for the public to report spills or illicit discharges through the existing work order line. This hotline will be publicized to the Clemson University community through Public Education efforts by Carolina Clear.

**Measurable Goal:** Reporting line established by August 1, 2017

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities & Carolina Clear

**BMP:** Establish a webpage for public reporting of spills or illicit discharges by August 1, 2017. This webpage will be publicized to the Clemson University community through Public Education efforts by Carolina Clear.

**Measurable Goal:** Webpage established by August 1, 2017

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

**BMP:** Develop a "Illicit Discharge Incident Tracking Database" for documenting public reports of illicit discharges by July 1, 2017.

**Measurable Goal:** Tracking sheet developed by July 1, 2017

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

#### **4.3.h. Employee Training**

**BMP:** Identify appropriate employees that are likely to come in contact/observe an illicit discharge and develop a written list of these employees.

**Measurable Goal:** Written list by March 1, 2017.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

**BMP:** Develop and begin implementing training programs for appropriate employees that are tailored to highlight potential illicit discharges most likely to be relevant to the department or responsibilities of each group of employees.

**Measurable Goal:** Training programs developed and beginning to be implemented by March 1, 2017.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

**BMP:** Document all employee training conducted and store electronically.

**Measurable Goal:** Electronic documentation of training produced.

**Schedule:** Effort is ongoing.

**Responsible Party:** Clemson University Facilities

#### ***4.3.i. Additional Proactive Measures***

As part of Clemson University's goal of reducing the potential of illicit discharges to the MEP, some additional proactive measures will be taken. These measures will be implemented through the following BMPs.

**BMP:** Clemson University will continue to prioritize buildings on campus in terms of their likelihood of containing an illicit connection to the stormwater system through dye testing (procedure described in Appendix I). 90% of on-campus buildings have been investigated thus far. 5% of the remaining 10% will be investigated for illicit connections each year moving forward until all have been investigated. Follow-up testing will be done on any buildings found to have an illicit connection to ensure that corrective action has been taken.

**Measurable Goal:** 95% by March 2018, 100% by March 2019 investigated and documented.

**Schedule:** 95% by March 2018, 100% by March 2019. Effort is ongoing. Work has begun to provide further assistance to address Illicit Connections to Floor Drains that are connected to storm systems. Anticipate implementation in 2022.

**Responsible Party:** Clemson University Facilities

**BMP:** In addition to field screening of points/outfalls selected as part of the IDDE program, Clemson University will continue to conduct annual and quarterly outfall surveys which note the condition, wear, flow, surrounding area, and recommended maintenance. Annual outfall surveys will cover all outfalls greater than 4 inches in diameter.

**Measurable Goal:** 100% of outfalls possessing a natural groundwater flow will be surveyed during permit cycle.

**Schedule:** Surveyed annually

**Responsible Party:** Clemson University Facilities

**BMP:** Clemson University will perform a comprehensive survey of all new storm drainage structures on campus annually. Data obtained will be entered into the electronic database which contains all stormwater drainage features construction prior to 2015. This database is known as the Clemson University Atlas.

**Measurable Goal:** Annual survey of new storm drainage to be performed. Electronic database to be updated annually.

**Schedule:** Surveyed annually

**Responsible Party:** Clemson University Facilities

#### **4.4 Construction Site Runoff Control**

##### **4.4.a. Overview**

For the purpose of the SMS4 permit, “construction activity” is defined as clearing, grading, and/or excavating that results in land disturbance of greater than or equal to one acre or is part of a larger common plan (LCP). Through a Memorandum of Understanding with Pickens County, Pickens County will be assisting Clemson University in reducing pollutants in stormwater as a result of construction activity and fulfilling the requirements for this minimum control measure.

##### **4.4.b. Pickens County BMPs to be Implemented**

BMPs identified in the *Construction Site Runoff Control* Section of the *Pickens County Stormwater Management Program Plan* will be implemented and enforced by Pickens County in the Clemson University SMS4 boundary beginning September 1, 2017, except to the extent inconsistent with the University’s Policy 17. These BMPs and the entirety of the *Pickens County Stormwater Management Program Plan* can be found in Appendix F. Enforcement authority held by Pickens County is established in the Pickens County Stormwater Ordinance (Appendix G) Enforcement procedures should be followed in accordance with the Clemson University ERP (Appendix E).

##### **4.4.c. Superseding Design Standards**

In the situation that Clemson University design standards established in *The Guidelines for Commission Architects & Engineers* are more stringent than those identified in the *Pickens County Design Manual*, the standards set by the University shall supersede those of Pickens County.

#### **4.5 Post-Construction Storm Water Management for New & Redevelopment**

##### **4.5.a. Overview**

A Post-Construction Stormwater Management Program has been developed to ensure that new and re-developed sites meet the performance standards set in Section 4.2.5.2 of the General Permit and to prevent or minimize water quality impacts to the MEP.

Through a Memorandum of Understanding with Pickens County, Pickens County will be assisting Clemson University in fulfilling the requirements for this minimum control measure. This MCM will be fulfilled through the implementation of *Post Construction*

*Stormwater Management BMPs which Pickens County has developed as part of the Pickens County Stormwater Management Program Plan.*

#### **4.5.b. Pickens County BMPs to be Implemented**

BMPs identified in the *Post Construction Stormwater Management* Section of the *Pickens County Stormwater Management Program Plan* will be implemented and enforced by Pickens County in the Clemson University SMS4 boundary beginning September 1, 2017, except to the extent inconsistent with the University's Policy 17. These BMPs and the entirety of the *Pickens County Stormwater Management Program Plan* can be found in Appendix F. Enforcement authority held by Pickens County is established in the Pickens County Stormwater Ordinance (Appendix G). Enforcement procedures should be followed in accordance with the Clemson University ERP (Appendix E).

### **4.6 Pollution Prevention/Good Housekeeping**

#### **4.6.a. Overview**

Clemson University will develop and implement an operation and maintenance program that is effective in preventing or reducing pollutant runoff from University operations. Components of this program will be developed through the implementation of the BMPs listed in the following sections.

#### **4.6.b. Municipal Facility and Stormwater Control Inventory**

**BMP:** Establish an electronic list of all University-owned facilities and storm water controls to be maintained and available for review by the permitting authority.

**Measurable Goal:** Electronic list established.

**Schedule:** List established by March 1, 2017.

**Responsible Party:** Clemson University Facilities

#### **4.6.c. Assessment of Municipally-Owned or Operated Facilities**

**BMP:** Develop electronic "Potential Pollutant Discharge Assessment Criteria Checklist" that will to be used to identify high priority facilities.

**Measurable Goal:** Electronic checklist developed.

**Schedule:** Checklist developed by March 1, 2017.

**Responsible Party:** Clemson University Facilities

**BMP:** Establish an electronic list of "high priority" facilities which will be identified using the "Potential Pollutant Discharge Assessment Criteria" developed by the University.

**Measurable Goal:** Electronic list developed.

**Schedule:** Developed by May 1, 2017.

**Responsible Party:** Clemson University Facilities

#### **4.6.d. High Priority Facility Comprehensive Inspections**

**BMP:** Develop an electronic inspection report form to be used to perform inspections of “high priority” facilities. This form will include identified deficiencies and corrective actions taken.

**Measurable Goal:** Electronic form developed.

**Schedule:** Developed by May 1, 2017

**Responsible Party:** Clemson University Facilities

**BMP:** Develop a schedule for conducting annual inspections of each high priority facility by June 1, 2017. First inspections to begin by July 1, 2017.

**Measurable Goal:** Schedule developed.

**Schedule:** Schedule developed by June 1, 2017. Effort is ongoing.

**Responsible Party:** Clemson University Facilities

**BMP:** Conduct inspections of high priority facilities using the developed electronic inspection report forms, according to the schedule set. Inspections will begin by July 1, 2017, as set in the schedule for inspections.

**Measurable Goal:** Inspections begin

**Schedule:** Inspections begin by July 1, 2017. Inspections performed but effort is ongoing for development of electronic inspection forms. Anticipate implementation in 2022.

**Responsible Party:** Clemson University Facilities

#### **4.6.e. Storm Sewer System Maintenance**

##### **3.6.d.i. Catch Basin Prioritization and Maintenance**

**BMP:** Establish a map displaying the catch basins that have high potential of receiving pollutants by October 1, 2017. Catch basins will be considered to possess high potential of receiving pollutants if they are located downstream of facilities classified as “high priority facilities” and will be referred to as “high priority catch basins.”

**Measurable Goal:** Map produced

**Schedule:** Map produced by October 1, 2017.

**Responsible Party:** Clemson University Facilities

**BMP:** Develop a maintenance schedule that covers maintenance on all University-owned catch basins but gives priority to those identified as “high priority catch basins.”

**Measurable Goal:** Schedule developed

**Schedule:** Effort ongoing.

**Responsible Party:** Clemson University Facilities

#### ***4.6.e.ii. University Activities and Operations***

**BMP:** Develop and make available to the appropriate personnel, a written document of “Standard Operating Procedures” (SOPs) for the activities/operations listed below. The goal of these SOPs will be to provide guidelines for minimizing pollution that will enter stormwater.

SOPs to be Developed for the following Activities/Operations:

1. Catch Basin Cleaning
2. Storm Drain System Repair and Maintenance
3. Erosion and Sediment Control
4. Landscape Design and Maintenance
5. Storage and Disposal of Fertilizers and Pesticides
6. Fertilizing and Turf Health Applications
7. Weed and Pest Control
8. Mowing and Irrigation
9. Vehicle and Equipment Storage
10. Vehicle and Equipment Washing
11. Vehicle and Equipment Fueling
12. Spill Clean-up
13. Parts Cleaning
14. Spare Parts Storage
15. Alternate Products Use/Storage/Disposal
16. Petroleum and Chemical Disposal
17. Petroleum and Chemical Handling
18. Petroleum and Chemical Storage – Bulk
19. Petroleum and Chemical Storage – Small Quantity
20. Garbage Storage
21. General Facilities Housekeeping
22. Floor Drains
23. Painting
24. Street Sweeping
25. Used Cooking Oil Procedures (all)
26. Pressure Washing and Associated Activities



- 27. Portable Toilet Placement and Cleaning Procedures
- 28. Student Construction Activities (all)
- 29. Contractor Oversight

**Measurable Goal:** SOPs developed and made available to appropriate personnel.

**Schedule:** SOPs developed and available by January 1, 2018.

**Responsible Party:** Clemson University Facilities

#### ***4.6.e.iii. Structural Stormwater Control Maintenance***

**BMP:** Develop a maintenance schedule that covers maintenance on all University-owned structural stormwater controls and green infrastructure.

**Measurable Goal:** Maintenance schedule developed

**Schedule:** Developed by March 1, 2017.

**Responsible Party:** Clemson University Facilities

#### ***4.6.f. Employee Training and Education***

**BMP:** Develop a list of appropriate employees involved in implementing pollution prevention and good housekeeping practices who should receive annual training.

**Measurable Goal:** List developed

**Schedule:** List developed by March 1, 2017

**Responsible Party:** Clemson University Facilities

**BMP:** Develop and begin implementation of a general pollution prevention and good housekeeping training program with adaptations for each department identified as employing appropriate personnel for receiving training. Records of all trainings held will be kept and included in each Annual Report.

**Measurable Goal:** Trainings begin

**Schedule:** Training to begin by March 1, 2017

**Responsible Party:** Clemson University Facilities

#### ***4.6.g. Contractor Oversight***

**BMP:** Clemson University Facilities will provide oversight of contractor operation and maintenance activities within the SMS4 boundary to ensure compliance with stormwater control measures, good housekeeping practices, and facility-specific stormwater management procedures.

**Measurable Goal:** Oversight provided by Clemson University

**Schedule:** Clemson University Facilities responsible for oversight beginning March 1, 2017

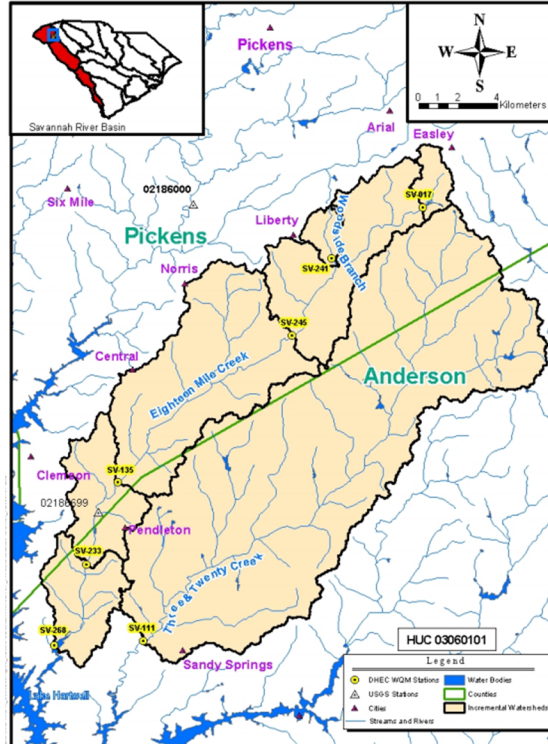
**Responsible Party:** Clemson University Facilities

#### 5.0 TMDL Monitoring and Assessment

A small area (4%) of Clemson University's campus drains to the Eighteen Mile-Creek watershed. This watershed is classified as a TMDL watershed. The parameter of concern that has led to classification as a TMDL watershed for this area is E. Coli. To reduce impact to the Eighteen Mile-Creek watershed to the MEP, Clemson University has implemented a variety of LID stormwater management BMPs selected to reduce the potential of introducing E. Coli to downstream waterways. These LID BMPs include but are not limited to, bioretention cells/rain gardens, porous surfacing, and vegetated swales. These BMP's encourage infiltration which filters E. Coli from stormwater. The infiltration process encouraged through these LID BMP's eliminates the need to monitor for E. Coli input from Clemson University at the downstream TMDL monitoring station.

Clemson University will perform an annual assessment to evaluate the effectiveness of currently implemented LID BMPs in the reduction of E. Coli from stormwater discharges to the Eighteen Mile Creek Watershed. From this evaluation, the University will determine if additional LID BMPs are necessary in achieving reduction of the parameter of concern.

Figure 1.1 Eighteen Mile Creek and Three and Twenty Creek Watersheds



[https://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl\\_upsav\\_fc.pdf](https://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_upsav_fc.pdf)

## 6.0 Record Keeping

Records of all TMDL related assessments/evaluations, a copy of the NPDES permit, and records of all data used to complete the application (NOI) for this permit must be retained by the University for at least three years from the date of the document/action, or for the term of the permit, whichever is longer, as stated in *Section 5.2 of the NPDES General Permit for Storm Water Discharges from Regulated SMS4*. The period of record retention may be extended by request of the Department at any time.

Records must be submitted to the Department upon request. A description of the SWMP required by this permit must be made available at a location accessible to the Department. Records must be made available to the public if requested in writing to do so.

## 7.0 Reporting Requirements

An “Annual Report” must be submitted to DHEC based on the following schedule:

- The first annual report must be submitted to the Department fourteen months after the effective date of permit coverage.
- Subsequent annual reports shall be submitted every twelve months from the scheduled date of the first submittal.

- The last annual report shall be submitted, as part of renotification, 180 days prior to expiration date of the permit, see Part 2.5, Renotification, of the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*.
- While, and if, the expired permit is continued, Annual Reports will be due on the anniversary date of the NEW PERMITTEE certificate of coverage. See Parts 2.6, Continuation of the Expired Permit, of the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*.

The Annual Report must contain the following information as written in the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*:

- 1) The status of the University's compliance with permit conditions, an assessment of the appropriateness of the identified BMP under Part 4, progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP, and the measurable goals for each of the minimum control measures;
- 2) Results of information collected and analyzed, if any, during the reporting period, including monitoring data used to assess the success of the program at reducing the discharge of pollutants to the MEP;
- 3) A summary of the storm water activities Clemson University plans to undertake during the next reporting cycle (including an implementation schedule);
- 4) Proposed changes to the SWMP, including changes to any BMP or any identified measurable goals that apply to the program elements; and
- 5) Notice that Clemson University is relying on another entity to satisfy some of the permit obligations (if applicable).
- 6) Information requested in the permit including, but not limited to: sections 1.4.7, 3.1.1.1, 3.2.1.1, 3.2.1.2.2, 3.3.6, 4.1.6 and in the additional conditions applicable to NPDES MS4 permits contained in Appendix B of the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*.

#### 8.0 Transfer of Operational Authority, or Responsibility for SWMP Implementation

Clemson University must implement the SWMP on all new areas added to the SMS4 (or for which the University becomes responsible for implementation of storm water quality controls) as expeditiously as practicable, but no later than one year from addition of the new areas. Implementation may be accomplished in a phased manner to allow additional time for controls that cannot be implemented immediately.

Within 90 days of a transfer of operational authority, or responsibility for SWMP implementation, Clemson University must have a plan for implementing the SWMP on all affected areas. The plan may include schedules for implementation. Information on all new annexed areas and any resulting updates required to the SWMP must be included in the annual report.

Only those portions of the SWMP specifically required as permit conditions shall be subject to the modification requirements of South Carolina Water Pollution Control

Permits Regulation 619.124.5. Addition of components, controls, or requirements by the permittee(s) and replacement of an ineffective or infeasible BMP implementing a required component of the SWMP with an alternate BMP expected to achieve the goals of the original BMP shall be considered minor changes to the SWMP and not modifications to the permit.

## 9.0 Reviewing and Updating the SWMP

### 9.1 SWMP Review

In order to prepare the Annual Report required for maintaining compliance with the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*, an annual review of the SWMP must be performed.

### 9.2 SWMP Updates

Alterations or updates to the SWMP may be made during the life of the permit in accordance to the following procedures identified in *Section 4.5.2 of the NPDES General Permit for Storm Water Discharges from Regulated SMS4*:

- *Changes adding (but not subtracting or replacing) components, controls, or requirements to the SWMP may be made at any time upon written notification to the Department.*
- *Changes replacing an ineffective or unfeasible BMP specifically identified in the SWMP with an alternate BMP may be requested at any time. Unless denied by the Department, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, the Department will send the University a written response giving a reason for the decision. Clemson University's modification requests must include the following:*
  - *An analysis of why the BMP is ineffective or infeasible (including cost prohibitive),*
  - *Expectations on the effectiveness of the replacement BMP, and*
  - *An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.*
- *Change requests or notifications must be made in writing and signed in accordance with Section 122.22 of SC Regulation 61-9 (see Appendix B of this permit).*

### 9.3 SWMP Updates Required by the Department

According to the *NPDES General Permit for Storm Water Discharges from Regulated SMS4*:

*The Department may require changes to the SWMP as needed to:*

- *Address documented impacts on receiving water quality caused, or contributed to, by discharges from the SMS4;*
- *Include more stringent requirements necessary to comply with new Federal statutory or regulatory requirements; or*
- *Include such other conditions deemed necessary by the Department to comply with the goals and requirements of the Clean Water Act.*

*Changes requested by the Department must be made in writing, set forth the time schedule for the University to develop the changes, and offer the University the opportunity to propose alternative program changes to meet the objective of the requested modification. All changes required by the Department will be made in accordance with South Carolina Water Pollution Control Permits Regulation 61-9 124.5, 122.62, or as appropriate 122.63.*