



**Standard Operating Procedure:  
Outfall Inspections**

Date: 12/21/2018\*      Version: 3      Review Frequency: Annual

**Reasons for Procedure**

The University of Virginia (UVA) has a permit to operate a Municipal Separate Storm Sewer System (MS4) issued by the Virginia Department of Environmental Quality. This permit authorizes UVA to discharge stormwater pursuant to the Virginia Stormwater Management Program and the Virginia Stormwater Management Act.

Since storm drain systems are not connected to a sanitary sewer treatment plant, water traveling through the storm drain system flows directly to local streams, rivers and lakes untreated. An illicit discharge to the storm system is generally defined as any discharge that is not composed entirely of stormwater. UVA’s MS4 Program “shall include all procedures developed by the operator to detect, identify, and address nonstormwater discharges to the MS4.”<sup>1</sup>

**1.0 Purpose**

The purpose of this procedure is to conduct routine dry weather inspections of storm sewer outfalls in order to detect illicit discharges as required by the MS4 Permit.

**2.0 Scope**

An outfall is the point where a municipal separate storm sewer discharges to surface waters. This definition 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 surface waters and are used to convey surface waters. All outfalls are mapped in UVA’s GIS map.

An illicit discharge is any direct or indirect non-storm water discharge to the storm drain system that causes flow from a storm drain during dry weather containing pollutants and/or pathogens

**3.0 Responsibility**

**3.1 Facilities Management Environmental Resources**

The Associate Director of Environmental Resources (ER) is responsible for ensuring that employees are properly informed of and trained on how to follow these procedures and are using the most current version of the procedures.

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<sup>1</sup> General Permit No: VAR040073, General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.

ER staff are responsible for working with Geospatial Engineering Services (GES) staff to ensure that all outfall and inspection location maps are updated as needed.

### **3.2 Personnel Performing the Job**

Anyone responsible for conducting outfall inspections must follow these procedures.

## **4.0 Procedures**

### **4.1 Inspection Schedule**

In accordance with the MS4 permit requirements, a minimum of 50 outfalls will be inspected annually. A number of UVA outfalls occur in locations where UVA's MS4 connects to streams flowing in pipes underground. In these instances, the outfall is marked on the GIS Map for identification purposes and an inspection location has been designated on the surface downstream of the outfall. Inspection locations are also mapped in GIS. Both the outfall map and the outfall inspection map as well as the list of these locations are maintained by GES.

Approximately 60 inspection locations have currently been identified in the GIS map. Since this number is just slightly more than the required minimum of 50 inspection locations, all outfall inspection locations will be inspected annually. Several outfalls have been designated as inspection points and are not truly outfalls. These locations have been chosen due to their location and their upstream drainage areas.

#### **4.1.1 Environmental Conditions**

The best time of year to conduct inspections is during late fall, winter, or early spring when stream vegetation is at a minimal level. Inspect after a dry period of at least 48 hours, and when groundwater levels are low. Information regarding the date and amount of the last rainfall can be found on The Weather Channel's website by looking up the City of Charlottesville and clicking on the "monthly" data page.

#### **4.1.2 Timing**

Inspect outfalls that are located near each other to minimize travel time between each outfall. Outfall inspections should be conducted over the course of two to four days, depending on the number of outfalls inspected, to ensure relatively constant weather conditions for each outfall.

### **4.2 Inspection Preparation**

Before going out into the field, assemble the following tools:

- 4.2.1 Camera to take pictures of each outfall to document any irregularities
- 4.2.2 Copies of blank field inspection logs or AiM app
- 4.2.3 Map of area to be inspected with outfall inspection locations shown
- 4.2.4 Tape measure

### 4.3 Inspection Form

Conduct field inspections using the attached outfall impact form or through an electronic inspection form via AiM. Both inspection forms require the same information.

#### 4.3.1 Background Information

The first section of the outfall form contains room for background information. Identify the watershed in which the outfall is being inspected, the name of that outfall, who is inspecting the outfall, and record the date and quantity of the last rainfall. This information should be filled out before leaving for the field and will help contextualize the rest of the inspection report. The date and time should be filled out in the field while conducting the inspection.

#### 4.3.2 Outfall Information

4.3.2.1 The form asks for the location, type, size, and condition of the outfall and its surrounding environment. Determine if the outfall is an enclosed pipe or an open channel and record its material, shape, and dimensions accordingly. If it is a closed pipe, record whether it discharges above the water level or is submerged.

4.3.2.2 Also in the second section, characterize the flow of water coming out of the pipe and include a rough estimate of the flow rate.

4.3.2.3 Note any concerns or unusual observations in the comments section

#### 4.3.3 Flowing and Non-Flowing Outfalls

4.3.3.1 Note whether the outfall exhibits signs of physical deterioration, and if so give detail as to what kind and how severe. Note any odors, deposits or stains inside the pipe

4.3.3.2 Also note the condition of the environment immediately following the outfall. Vegetative density refers to the presence of vascular plants directly below an outfall, whereas pipe benthic growth describes any algal or bacterial growth within the pipe walls. If there is a pool of water below the outfall, check for any irregularities in odor, color, or floatables.

#### 4.3.4 Flowing Outfalls

4.3.4.1 If flow was noted as present in the second section, record observations related to odor, color, turbidity, and any floating material in the third section of the outfall investigation form. Indicate the severity.

4.3.4.2 Other concerning conditions including excess trash, bank erosion, excessive sedimentation, or anything else observed but not listed can be noted in the third section.

#### 4.3.5 Inspection Results

4.3.5.1 Based on comments and issues identified in the relative severity index, determine whether further investigation is needed. For obvious signs of

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an illicit discharge, immediately begin the follow up procedures outlined in section 5.0.

4.3.5.2 Any outfall that that requires follow-up should be noted at the top of the page, in the blank space to the left of the “stormwater outfalls OT” text. Writing in this area is easily identified and can be pulled out quickly by someone sorting through the reports looking for issues.

4.3.5.2.1 Follow up is not limited to illicit discharges, but may include work to improve pipe conditions or remove vegetation, depending on severity.

### 5.0 Follow-up

**5.1** If any concerning conditions are observed, the problem will be addressed in the following manner:

**5.1.1** Outfalls with suspected illicit discharges of sanitary sewage or otherwise significantly contaminated should be investigated first before outfalls that may contain less hazardous non-stormwater discharges such as noncontact cooling water or wash water.

**5.1.2** Call Cameron Ratliff at Utility Systems Distribution at 434-982-1090 (office) or 434-531-9645 (cell). If Cameron Ratliff is unavailable, call the FM Service desk at 434-924-1777 for another individual in Utility Systems Distribution who can respond to the concern. Describe the nature of the issue and the exact location.

### 6.0 Review of Procedure/Training

The Associate Director of Environmental Resources is responsible for reviewing this procedure with anyone responsible for conducting outfall inspections.

### 7.0 Regulatory impacts

Illicit discharges such as exterior surface wash water are prohibited by the University’s MS4 permit and by the City of Charlottesville’s Water Protection Ordinance. The University’s storm sewer system is directly connected to the City’s; therefore, any discharge into UVA’s storm system impacts the City’s storm sewer system. This offense is punishable by civil and criminal penalties as illicit discharges constitute a threat to the public health, safety, and welfare, and are deemed public nuisances.

\*Printed versions of SOPs with previous review dates are considered current as long as the version number is the same as the current version. Current versions of all SOPs are maintained on the UVA Environmental Resources website.





Watershed/Subshed:	Assessed by:
Outfall ID:	Date of Last Rainfall:
Date: _____ Time: _____	Rainfall Quantity: _____

TYPE	MATERIAL	SHAPE	SUBMERGED	GENERAL OBSERVATIONS	
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> Concrete <input type="checkbox"/> PVC/Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Brick <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double	<u>In Water:</u> <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully <u>With Sediment:</u> <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully	
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid: <input type="checkbox"/> Parabolic: <input type="checkbox"/> Other: _____	Depth: _____ Width (top): _____ (bottom): _____		
Flow	<input type="checkbox"/> None <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial <input type="checkbox"/> Estimate flow rate _____				

**FOR BOTH FLOWING and NON-FLOWING OUTFALLS:**

INDICATOR	DESCRIPTION	COMMENTS
<input type="checkbox"/> Pipe Condition	<input type="checkbox"/> Chip/Cracked <input type="checkbox"/> Corrosion <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Other: _____	
<input type="checkbox"/> Odor	<input type="checkbox"/> Gas <input type="checkbox"/> Sewage <input type="checkbox"/> Sulfide <input type="checkbox"/> Other: _____	
<input type="checkbox"/> Deposits/Stains	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Iron	
<input type="checkbox"/> Vegetation	<input type="checkbox"/> Normal <input type="checkbox"/> Inhibited <input type="checkbox"/> Excessive	
<input type="checkbox"/> Pipe Benthic Growth	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other: _____	
<input type="checkbox"/> Pool Quality	<input type="checkbox"/> Good <input type="checkbox"/> Odors <input type="checkbox"/> Algae <input type="checkbox"/> Colors <input type="checkbox"/> Oils <input type="checkbox"/> Suds	

**FOR FLOWING OUTFALLS:**

INDICATOR	DESCRIPTION	RELATIVE SEVERITY INDEX		
<input type="checkbox"/> Odor	<input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1 - Faint	<input type="checkbox"/> 2 - Easily detected	<input type="checkbox"/> 3 - Noticeable from a distance
<input type="checkbox"/> Color	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Grey <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1 - Trace colors	<input type="checkbox"/> 2 - Faint Colors	<input type="checkbox"/> 3 - Clearly visible
<input type="checkbox"/> Turbidity	See Severity	<input type="checkbox"/> 1- Slight Cloudiness	<input type="checkbox"/> 2 - Cloudy	<input type="checkbox"/> 3 - Opaque
<input type="checkbox"/> Floatables (not including trash)	<input type="checkbox"/> Sewage <input type="checkbox"/> Suds <input type="checkbox"/> Iron <input type="checkbox"/> Petroleum (oil sheen)	<input type="checkbox"/> 1 - Few/slight	<input type="checkbox"/> 2 - Some; indication of origin	<input type="checkbox"/> 3 - Many