

How to Identify & Report Water Pollution from Illicit Discharges

► Residents have an important role in detecting and reporting illicit discharges to protect local waterways. Perhaps you have seen a leaking pipe, an overflowing grease bin, or sediment washing into a storm drain and wondered, Is that okay? What should I do about that? Learn how pollutants can enter the storm sewer system and how residents can help detect and report problematic discharges.

What Is an Illicit Discharge?

Illicit discharges can happen when pollutants enter waterbodies via a storm sewer system or are poured directly into a storm drain, ditch, or stream. Unlike sanitary sewers that take wastewater from your home or business to a wastewater treatment plant, storm sewers often take untreated water directly to local creeks and rivers. As rainwater enters storm drains, it picks up pollutants such as litter, oil, or fertilizer from parking lots, streets, and lawns. This polluted runoff, called *nonpoint source pollution*, is linked to adverse health and environmental impacts on waterways used for drinking water, swimming, fishing, and more. Nonpoint source pollution is linked to degraded water quality that causes waterbodies to become impaired. Alabama Department of Environmental Management (ADEM) 303d/305b waters summary reports identify waterbodies in your area that are considered impaired.

How Are Illicit Discharges Monitored?

Many Alabama cities have storm sewer systems separate from their sanitary sewer systems. These systems use a collection of structures (retention basins, ditches, roadside inlets, and underground pipes) to gather stormwater and discharge it into local streams and rivers. The term for describing such a system is *municipal separate storm sewer system* or MS4. The word *municipal* refers to a unit of local government, such as a township, but it may also refer to an organization responsible for administering a developed area. The 4 refers to the four words that start with the letter S—separate, storm, sewer, and system.

In these systems, there is no treatment process between the source of the stormwater and when the water enters a waterbody. It is called a *separate system* because it is not connected to the sanitary sewer system, which



Figure 1. Storm drains can transport runoff known as *nonpoint source pollution*. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

drains wastewater from inside a home to a sewage treatment facility or a private septic system.

MS4 communities receive authorization from the Alabama Department of Environmental Management to discharge stormwater into local streams and rivers legally. This authorization is called an *NPDES permit*, which stands for National Pollution Discharge Elimination System. The word *National* references the connection with the federal Clean Water Act, and the word *Discharge* refers to the fact that separate storm sewer systems eventually release untreated stormwater into local creeks, rivers, and lakes. These permits are more commonly called *MS4 permits* or *stormwater permits*.

To meet the terms of their stormwater permits, MS4 communities must develop a Stormwater Management Program (SWMP). Communities that discharge stormwater into waterbodies that are considered impaired or not meeting their water quality standards are also required to develop a Pollutant Reduction Plan (PRP).

Illicit discharge detection and elimination is one of the six minimum control measures the Environmental Protection Agency considers essential for success in many Alabama cities' stormwater management plans (SWMP). Other measures include the following:

- Public education and outreach
- Construction site erosion control
- Public participation and involvement
- Post-construction stormwater management
- Illicit discharge detection and elimination
- Pollution prevention and good housekeeping

What Causes Illicit Discharges?

Illicit discharges can be caused by a variety of things, including the following:

- **Washwater flows:** Laundry flows, commercial car wash wastewater, fleet washing, and commercial laundry wastewater can all contribute chemicals to waterways (figure 2).

- **Sewage and septage:** Flows produced from leaky sewer pipes and failing septic systems. Sewage has the greatest potential to produce direct illicit discharges within any urban watershed, regardless of its diverse land uses. Sewage leaks can occur as a by-product of waterbody channel widening and erosion that happens over time and may expose or alter storm drains or sewer pipes (figure 3). Another concern is aging infrastructure, resulting in broken sewer lines.

- **Excess natural material:** Dumping grass clippings or leaves can produce excess nutrients in waterways (figure 4).

- **Liquid waste:** Examples include oil, paint, process water, washing of concrete, paint, mud, or other construction waste (figures 5 and 6).

- **Litter:** Illegal dumping and excess litter are considered illicit discharges.

Table 1 shows potential land activities that may produce illicit discharges if improperly maintained. This list is adapted from the 2004 Illicit Discharge Detection and Elimination Handbook by the Center for Watershed Protection.

Table 1. Land Use Activities That Can Produce Indirect Discharges

Land Use	Generating Site	Activity-Producing Discharges
Residential	Apartments, housing	Car washing, driveway cleaning, dumping and spills, equipment washing, lawn and landscape watering, septic system maintenance, swimming pool discharges
Commercial	Campgrounds, RV parks, car dealerships and rentals, car washes, commercial laundry/dry cleaning, marinas, gas stations and auto repair shops, nurseries and garden centers, restaurants, swimming pools	Building maintenance (power washing, dumping/spills, landscaping and fertilizing, outdoor fluid storage, vehicle fueling, vehicle maintenance and washing, washdown of greasy equipment
Industrial	Auto recycling, beverage and brewing, construction vehicle washouts, distribution centers, food processing, garbage truck washouts, metal plating, printing, oil storage and refining	Industrial process water or rinse water, commercial activities, outdoor materials storage, material washdowns
Institutional	Cemeteries, churches, hospitals, corporate campuses, schools or universities	Building maintenance (power washing), dumping and spills, landscaping and fertilizing, vehicle maintenance and washing
Municipal	Airports, landfills, fleet maintenance depots, ports, streets and highways, sewer systems	Building maintenance, dumping and spills, grounds care/irrigation, outdoor fluid storage, road/parking maintenance, vehicle fueling/repair/washing, sewer maintenance

Brown, E., Caraco, D., Pitt, R. 2004. Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments. Center for Watershed Protection, Ellicott City, MD & University of Alabama, Tuscaloosa, AL.



Figure 2. Wash water entering a waterbody. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 3. Overflowing sewer system. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 4. Grass clippings in a waterbody. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 5. Liquid waste from industrial oil and grease. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

What Is Not Considered Illicit Discharge?

The following are not considered illicit discharges in most city ordinances:

Natural discharges:

- Rising groundwaters
- Natural springs

Human-made discharges:

- Waterline flushing, such as fire hydrant testing
- Landscape irrigation
- Diverted waterbody flows
- Discharges from potable water sources
- Foundation or footing drains
- Irrigation
- Air conditioning condensation
- Individual car washing
- Dechlorinated swimming pool discharges
(Chlorinated pools could be harmful if discharged into storm drains or streams).



Figure 6. Mud entering a storm drain. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 7. Exposed sewer line due to widening waterbody bank erosion. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

How to Identify Illicit Discharges

Although no single indicator can be used to identify the source and origin of an illicit discharge, certain indicators in the water help municipal water resource managers prioritize and refine their investigations.

Flowing Water. If it has been more than three days since the last rain event, dry weather flow may indicate an illicit discharge. Flow alone is not a strong indicator of an illicit discharge unless the source of the discharge is evident (figure 8).



Figure 8. Water piped from construction site to creek. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

Color. Different colors can indicate potential sources of contamination.

- **White water** could be an indicator of paint wash, detergents, or other cleaning solutions or solvents. Milky water could also indicate paint wash, concrete wash, or possible sanitary sewage (figure 9).
- **Gray/tan water** could indicate laundry water, sanitary sewage, or possible concrete wash (figure 10).
- **Purple water** could be an indicator of oil or other petroleum discharge, possibly textile dye, paint, or other chemicals. Green could be a sign of antifreeze, fertilizer, or more.



Figure 9. Paint discharging from outfall. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 10. Milky gray/tan water. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 11. Purple water. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

- **Orange water** could indicate possible construction dewatering or construction best management practices not being followed (figure 12). Orange could also indicate iron floc—also known as iron flocculent—which is not an illicit discharge but a natural phenomenon caused by iron-oxidizing bacteria that commonly occur in waterbodies near iron-rich soils in Alabama and the Southeast. Iron floc appears as an oily-orange slime substance on submerged rock or wood (figure 13).



Figure 12. Orange water from construction. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)



Figure 13. Orange water from naturally occurring iron floc.

Table 2. Water Colors and Their Potential Pollutant Indicators

Color	What It May Indicate
White water	Potential paint wash, detergents, or other cleaning solutions/solvents, concrete wash, or possible sanitary sewage.
Gray or tan water	Potential laundry water, sanitary sewage, or possible concrete wash.
Purple or other colors	Potential oil or other petroleum discharge, possible textile dye, paint, or other chemicals. Green could be a sign of antifreeze, fertilizer, or more.
Orange water	Possible construction dewatering or construction best management practices not being followed. Orange could also indicate naturally occurring iron floc.

Odor. Sometimes odors can be indicators of illicit discharges. Table 3 outlines odors and their potential indicators.

Floatables. Common examples of floatables are fecal matter, oily sheens, suds, and tissue paper (figure 14).

Growth and staining. Excessive algae growth is sometimes an indicator of an illicit discharge causing excess nutrients to enter the waterway, likely from fertilizers, sewer overflows, or failing septic systems (figure 15).

Water quality. Chemical and bacteriological testing of water quality provides information about whether a water body meets its water quality standards while also providing insight into potential causes of illicit discharge.



Figure 14. Foam suds in a creek. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

Table 3. Smells and Their Potential Indicators

Odor	What It May Indicate
Septic, ammonia, or sewage	Sanitary sewer overflow, improperly connected sanitary sewer line, leaking septic tank
Rancid, sour, or pungent	Decomposing organic matter that may be associated with grass clippings or other debris in stormwater
Rotten egg	Can be indicator of hydrogen sulfide from propane or natural gas leak; leaking sewer line or septic tank
Fuel or petroleum	Leaking underground or aboveground fuel tanks, improper disposal of petroleum products
Solvents or other cleaning solution	Wash activity including car washes, floor cleaners, pressure washing with chemical additives

Taking Action: What Should I Do if I See an Illicit Discharge?

The protocol for reporting illicit discharge will vary by city, county, and town. Call 911 if the discharge appears to be a threat to public health or safety. This might include a large fuel spill or hazardous waste spill.

In a nonemergency, notify your local stormwater or public works department, health department, or water resources management department. Depending on your concerns, you can also file a complaint with the Alabama Department of Environmental Management via their online portal. You will be required to provide some personal information.



Figure 15. Excessive algae growth. (Photo credit: Dusty Kimbrow, Water Resource Management, Watershed Program Coordinator)

Is there a checklist of items I should note?

When you call to report an illicit discharge, be prepared to provide the date, address, details, and photos (if possible) of the evidence you saw. Capturing clear photos or videos with prominent landmarks or location indicators is the best way to document an illicit discharge so that further investigation can occur.

What Happens After I Call?

Depending on the discharge, municipalities will take steps to identify and rectify the issue.

Many cities will fine individuals or companies illegally discharging pollutants into storm sewer systems or local waterways. Once a problem area or discharge is found, additional efforts are usually necessary to determine the source of the problem. Methods that can find the source of the illicit discharge include dye-testing buildings in problem areas and dye- or smoke-testing buildings at the time of sale. If you want to be informed about the follow-up activities, you may request that you be contacted if action is taken.

Individuals in the community have an essential role in reporting potential pollutants. By working together, residents and local officials can make a positive difference in keeping our water clean and healthy for families in our communities and future generations.



Laura Cooley, *Administrator, Outreach Programs*, Crop Soil, and Environmental Sciences, Auburn University; **Dusty Kimbrow**, Water Resource Management, Watershed Program Coordinator, City of Auburn; and **Sydney Zinner**, Research Assistant, Auburn University

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