

Field Strategies for Detecting Illicit Discharge

1. Detection Tools

Detecting and eliminating illicit discharges is a required task under Ohio EPA's Phase II storm water permit, and also an important part of protecting water quality. Township and village personnel that frequently work in the field can help the Clermont County Storm Water Management Department tackle illicit discharge problems by serving as an "extra set of eyes."

To do this, field personnel first must be able to identify illicit discharges using multiple physical and sensory characteristics described below. Once a person has identified an apparent illicit discharge, he or she can record the information on the Illicit Discharge Detection Form (Attachment 1), and call the Storm Water Management Department to follow-up.

Note that **illicit discharges are best detected during dry weather conditions**. During and after a rain, any illicit discharges that may be present will likely be masked by other pollutants being carried by storm water runoff.

Illicit Discharge Detection Form

The Storm Water Management Department has created a useful tool for documenting and classifying illicit discharge in the field: the **Illicit Discharge Detection Form (IDDF)**. The concept of the IDDF is to establish a record of the intensity of the discharge, the present indicators at the time of detection, and the exact location of the discharge site. The form requires specific physical observations so that the discharge can be identified and evaluated properly.

There are four main descriptive components used to classify an illicit discharge: odor, color, turbidity, and floatables. The intensity of each sensory indicator can be measured using the "severity scale" portion of the IDDF. This scale gauges the severity of the offense by assigning a 1, 2, or 3 (1 being the least offensive, 3 being the most).

TIP: It is also very helpful to capture the existing conditions of the discharge on camera when first detected (record date!) so that any change in condition can be verified upon further monitoring of the site. A digital photograph of the discharge is the most helpful.

2. Identification of Illicit Discharge

Sensory Indicators

Each illicit discharge possesses a distinct group of physical characteristics. Based on these distinctions, unique sensory observations can be made that point to a specific source or generating site so that the illicit discharge can be addressed. *Sensory indicators* are observations that can be made using smell and/or sight, and require no measurement equipment initially. There are seven indicators that can predict an illicit discharge: *flow, odor, color, turbidity, floatables, deposits/stains* and *vegetation*. Although only a preliminary observation of a suspected illegal discharge, *sensory indicators* can be documented, sampled, and utilized for further study and ultimately the elimination of illicit discharges. Here are some ordinary sensory indications of an illicit discharge:

- Flow during dry weather
- Unusual color or cloudiness
- Strong odors
- Floating debris
- Surface scum or foam
- Oil sheen
- Dead vegetation or inhibited growth
- Stains on channel bottom, sides or rocks
- Pipe corrosion
- Algae

Any of the *sensory indicators* can leave physical traces of an illicit discharge, whether it is a continuous, intermittent, or one-time event. Physical indication of *past* illicit discharge can be outfall damage, deposits or stains, uncharacteristic vegetative growth on or around the outfall, or scour which signifies intermittent or past transitory discharge.

Flow

Flow coming from storm water pipes during extended periods of dry weather may be an indication of an illicit discharge. The presence of such flow should be noted on the Illicit Discharge Detection Form.

Odor

Before taking any steps in determining an illicit discharge due to *odor*, the field crew must unanimously establish where the odor is coming from. In some situations the source of the odor can be misleading; it may actually be shrubs, trash, carrion or animal waste. If the crew decides (after further inspection) that the outlet pipe is indeed the source of the odor, the intensity can be applied to a scale of *odor* severity (the IDDF). A value of one indicates that the odor is faint and barely detectable by the crew. A “two” signifies a moderate odor emanating from the outlet pipe. If a “three,” the odor is unbearable and can be sensed from some distance away. A sample of the stream can be taken as close to the source as possible even though there may not be another sensory indicator present. If samples are collected, call the Storm Water Management Department at 732-7880 to arrange for sample analysis.

Color

Color refers to the tinge of the discharge which can be categorized as clear, slightly tinted, or intense on the IDDF. When chemical discharges are present, the entire spectrum of colors is potentially visible: green, red, yellow, blue, white, and even brown or orange are possible (Figure 1). A rainbow sheen floating on the water surface may indicate a petroleum-based discharge (see *floatables*). If it can be discerned that the cause of the color is not natural, the physical characteristics should be recorded, and if possible, a sample should be taken. The sample should be captured in a clean, clear bottle and held up to the light so that an accurate judgment about its intensity and color can be made. Many times the source of the discharge can easily be traced by following the color plume upstream.



Figure 1 Indicator: color

Turbidity

Turbidity is a measure of the cloudiness of the water sampled at the discharge site (Figure 2). It is easy to confuse *turbidity* and *color*. The elemental difference is that turbidity is a measure of how easily the sample is penetrated by light, whereas color is a measure of the tint of the water. A turbid sample will contain a high concentration of suspended sediment whereas color will appear solid and may be clear or turbid (cloudy). Other sensory indicators can also be identified in the same sample with *turbidity*; such as *odor* or *floatables*.

A sample of the suspect illicit discharge may be collected in a clear bottle, much like *color*, where it can be scrutinized closely for suspended solids or other sensory indicators. Sometimes *turbidity* occurs in a scour or plunge pool underneath the outlet pipe. Often the origin of a discharge is not readily apparent, but can be traced by looking upstream for any *turbidity* plumes.



Figure 2 Indicator: turbidity

Floatables

This sensory indicator is a visual observation can usually be seen from a distance making it more noticeable than other indicators (Figure 3). Sewage, oil sheen, and suds are examples of *floatables*, while trash is generally not.



Figure 3 Indicator: floatables

Floatables can be ranked from 1 to 3 according to their mass. Different types of *floatables* (Table 1) have different characteristics associated with them. Sewage should automatically be ranked as “severe” and assigned a value of three because of the threat level to the health and well being of the stream and downstream inhabitants. Oil sheens that occur on the surface are ranked according to their thickness and coverage where small traces are assigned a “1” and larger sheens are assigned a 2 or 3 depending upon their thickness. The scale appears as:

- | |
|--|
| <input type="checkbox"/> Sewage (toilet paper, etc.) |
| <input type="checkbox"/> Petroleum (oil sheen) |
| <input type="checkbox"/> Suds |
| <input type="checkbox"/> Other _____ |

Table 1 Floatable Identification

- | |
|--|
| <input type="checkbox"/> 1- Slight |
| <input type="checkbox"/> 2- Some |
| <input type="checkbox"/> 3- Massive/Severe |

Table 2 Floatable Size Description

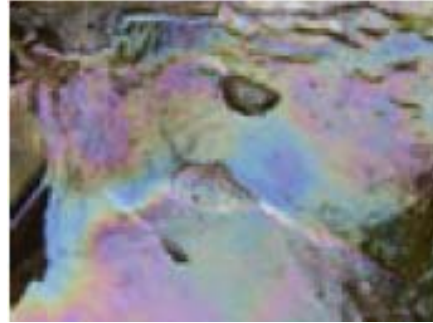


Figure 4 Severe oil sheen

Suds can be ranked according to their foaminess and staying power. Thick foam that floats several feet downstream before breaking apart is ranked a three because it possesses both staying power and thickness. Naturally occurring suds (Figure 5) will break up quickly and are generally clear or white.



Figure 5 Naturally-occurring suds

Deposits or Staining

There may be indications of past illicit discharges in the form of deposits and staining. Staining can occur at the base of the discharge pipe or on rocks below the outfall and may be a sign of persistent, intermittent discharges. Any deposits or stains should be marked on the IDDF as mineral, sediment, oily, grease or other. The color of the stain should also be noted.

Vegetation

Another sign of illicit discharges may be changes in vegetation. Some pollutants may kill vegetation around an outfall while others may promote excessive growth of algae or other vegetation. Changes in vegetation should be noted on the IDDF as none/dead, excessive, algae or other.

3. Filling out the Reporting Form

Once a suspected illicit discharge has been identified, the attached **Illicit Discharge Detection Form (IDDF)** should be filled out as completely as possible. Something should be recorded in all fields. The location should be identified as clearly as possible. If something does not apply, record "N/A." If something is observed in the field that is not listed on the IDDF, this should be recorded in the comments section. Once a form is completed, it should be faxed as soon as practical to the Storm Water Management Department at (513) 732-7310.

4. Reporting Spills and Illicit Discharges

If the incident is severe and immediately threatens public health or safety, call 911 and the Ohio EPA Spill Hotline listed to the right. Significant oil spills or rainbow sheens that indicate a petroleum spill should also be reported by calling 911.

If a sewage problem is suspected in an area that is served by public sewers, call one of the contacts listed to the right. If the problem is suspected to be the result of a failing septic system, contact the Health District at 732-7499.

For all discharges, including suspected sewage spills and emergency situations, the Illicit Discharge Detection Form should be completed and faxed to 732-7310. If a form is not available to fill out, call John McManus, Storm Water Management Department Program Manager, at 732-7880 to report the problem. Call this same number if there are any questions as to whether something is an illicit discharge.

<p><u>Severe Cases/Emergency</u> Emergency Management Agency 911</p> <p>Ohio EPA Spill Hotline 1-800-282-9378</p> <p><u>Sewage</u> Batavia 732-2020</p> <p>Clermont County Sewer District 732-7040</p> <p>Milford 831-6982 (Sanitary)</p> <p>831-7018 (Storm)</p> <p>Moscow 553-6870</p> <p>New Richmond 553-4146</p> <p>Williamsburg 724-6107</p> <p><u>Septic Systems</u> Health Dist. 732-7499</p> <p><u>All Discharges</u> Clermont County Storm Water Dept. 732-7880</p> <p>Fax Report to (513) 732-7310</p>
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