# OUTFALL AND MONITORING LOCATIONS GUIDANCE

## Procedures for Dry Weather Inspection, Sampling, Track Down and Elimination

**Dry weather:** No precipitation/snow melt for at least 48 hours (minimum; consider longer during periods of prolonged wet weather).

**I. Choose Monitoring Locations (outfalls, interconnections, intraconnections)**

a. Review previous outfall inspections; identify monitoring locations/outfalls requiring inspection or any that may require re-inspection.
b. Prepare for dry weather inspection: Monitoring Locations Inspection and Sampling Field Sheet, outfall report/current data for all to be inspected, storm system maps/route, clip board, pen.
c. Each outfall has a detailed report listing dimensions/composition of the pipe or ditch and also visual observations of the flow, if it was flowing at the time data were collected.
d. The outfall report should be updated to reflect any changes, especially the "Outfall Discharging" answer.
    i. Submit an Outfall Map Update Request form.
    OR
    ii. The Outfall Editor App can be used in the field to make real time changes to your outfall report, including a new picture. Do not change ownership or Outfall IDs.

**II. Inspect/Sample Monitoring Locations/Outfalls**

Dry weather inspections and sampling can be done at the same time.

a. Inspection
    i. Inspect each monitoring location scheduled for the year.
    ii. If you cannot find the end of the pipe or ditch, or it is inaccessible or unsafe to reach, locate the first upstream catch basin/access point to determine whether there is flow. Note the inspection point on the form if it deviates from the mapped monitoring location. Make a note in your files for future inspections.
    iii. <u>If no flow is present</u>, complete Sections 1, 2 and 5 on the Monitoring Locations Inspection and Sampling Field Sheet. <u>If flow is present</u>, complete Sections 4 and 6 too.
b. Sampling
    i. Schedule (or proceed with) sampling for monitoring locations discharging flow during dry weather based on completion of Sections 2, 4, 5 and 6 of the Monitoring Locations Inspection and Sampling Field Sheet. Complete Sections

3 and 7 if sampling. If the source of the illicit discharge is clear and discernable (e.g. sewage), sampling is not necessary.

ii. Suggested sampling equipment and supplies
Note: The equipment listed below, including the black light, was provided to all WNY Stormwater Coalition members in 2011.
The WNY Stormwater Coalition has test strips and equipment available to borrow. Purchasing information can be provided upon request.
Contact for both: Mary Rossi at mary.rossi@erie.gov.

- Equipment
  - Hanna pH/Temp/Conductivity/TDS Meter
  - 6' Dipper Sample Collector
  - Nalgene Wash Bottle
  - Safety Glasses
  - 600 mL plastic beakers (2)
  - Glass jar/bottle with tight lid
  - Disposable Gloves
  - Tape Measure
  - Distilled Water
  - Paper Towels
  - Trash Bag
  - Hand Sanitizer
  - Black Light Fixture and Cotton Pads
- Test Strips
  - Ammonia (Hach # 4315-70)
  - pH (LaMotte # 5049-36)
  - Total Chlorine (LaMotte # 5049-36)
  - Nitrite (LaMotte # 5049-39)
  - Nitrate (LaMotte # 5049-39)
  - Phosphate (Hach # 4315-75)

iii. Use the **Outfall and Monitoring Location Sampling Guide** (follows) to conduct on-site sampling using field meter and test strips; if detergent contamination is suspected (bubbles/suds/etc.), a sample will need to be brought back for exposure to black light. Record results in Section 3 on the Monitoring Locations Inspection and Sampling Field Sheet.

c. Retain forms as documentation of inspection/sampling for 5 years.

## III. Illicit Discharge Track Down

For all flows characterized as “suspect” or “obvious” in Section 6 of the Monitoring Locations Inspection and Sampling Field Sheet, source track down must be conducted according to the following timeframe:

a. Following inspection and sampling, within twenty-four (24) hours of discovery, the MS4 Operator must initiate track down procedures for flowing MS4 monitoring locations with **obvious** illicit discharges.
b. Within two (2) hours of discovery, the MS4 Operator must initiate track down procedures for **obvious** illicit discharges of sanitary wastewater that would affect bathing areas during bathing season, shell fishing areas or public water intakes and report orally or electronically to the NYSDEC Regional Water Engineer and local health department; and
c. Within five (5) days of discovery, the MS4 Operator must initiate track down procedures for **suspect** illicit discharges.
d. Consult sewer and land use maps to evaluate potential contributing area and characteristics of the area.
e. Visually inspect catch basins/manholes/ditches progressively upstream from the outfall/monitoring location to identify contributing areas with no flow that can be eliminated from further consideration.
f. It is possible that the visual inspections indicate the source of flow/contamination is from another MS4 entering your system at an interconnection. Contact their stormwater coordinator, in writing, and describe your findings along with a precise location for the point where flow from their system enters your system. Keep this documentation for 5 years. Add a note in your files or on the outfall report itself to save time and trouble for the next inspection.
g. See Track Down Techniques table for additional track down options.

**Track Down Techniques to Locate the Discharge**

| *Technique* | *Best Applications* | *Limitations* |
|---|---|---|
| Dye Testing | Discharge limited to a very small drainage area (<10 properties is ideal)<br>• Discharge probably caused by a connection from an individual property<br>• Commercial or industrial land use | • May be difficult to gain access to some properties |
| Video Testing | • Continuous discharges<br>• Discharge limited to a single pipe segment<br>• Communities who own equipment for other investigations | • Relatively expensive equipment<br>• Cannot capture non-flowing discharges<br>• Often cannot capture discharges from pipes submerged in the storm drain |
| Smoke Testing | • Cross-connection with the sanitary sewer<br>• Identifying other underground sources (e.g., leaking storage techniques) caused by damage to the storm drain | • Poor notification to public can cause alarm<br>• Cannot detect all illicit discharges |

(Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assistance, Center for Watershed Protection October 2004)

## IV. Illicit Discharge Elimination

a. Eliminate source of contamination or if nature of the source prohibits elimination, utilize targeted education to inform/minimize the source
(e.g. pet waste or pool/spa water disposed in storm sewers: distribute information on proper disposal throughout neighborhood).
b. The following timeframes are required for illicit discharge elimination:
    i. Within twenty-four (24) hours of identification of an illicit discharge that has a reasonable likelihood of adversely affecting human health or the environment, the MS4 Operator must eliminate the illicit discharge;
    ii. Within five (5) days of identification of an illicit discharge that does not have a reasonable likelihood of adversely affecting human health or the environment, the MS4 Operator must eliminate the illicit discharge;
    iii. Where elimination of an illicit discharge within the specified timeframes is not possible, the MS4 Operator must notify the Regional Water Engineer.
c. Refer to your Stormwater Management Plan (Appendix O) for detailed provisions for escalating enforcement and tracking. Your municipality has a local law specific to illicit discharges to assist with enforcement as needed.

## V. Documentation

The Monitoring Locations Inspection and Sampling Field Sheet completed in the field is to be filed and retained as compliance documentation for inspection and sampling. You may also scan the completed forms. If you opt to scan, create a new folder for each year or indicate year of inspection in the file name (this will be helpful for planning inspections to meet your compliance goal and for state/federal compliance audits). Retain all documentation for 5 years.

a. Inspection Frequency (20%/year)
    i. Completed Monitoring Locations Inspection and Sampling Field Sheets.
    ii. Record monitoring locations inspected on spreadsheet or whatever you use to track inspections. It doesn't have to be elaborate, just a tool to identify outfalls inspected and those in need of inspection.
    e.g. Outfall ID and date inspected are adequate. Additional information such as whether it was flowing and a "Notes" column are also useful.
b. Sampling
The Monitoring Locations Inspection and Sampling Field Sheet documents both inspection and sampling.
c. Track Down and Elimination
All steps and actions utilized to track down and eliminate illicit discharges should be carefully documented. There is no "one size fit" as each instance will be unique. Documentation should include all efforts taken to identify and eliminate the source of contamination: how track down was done, results of track down, actions to eliminate source of contamination, additional details, and any enforcement measures utilized.

# Outfall and Monitoring Location Sampling Guide

This document was prepared to serve as quick reference for sampling flowing outfalls using your Hanna meter for pH, temperature, Total Dissolved Solids (TDS) and Conductivity, test strips for Ammonia, pH, Total Chlorine, Nitrite/Nitrate and Phosphate, and black light/cotton pad for detergents. Depending on the results and visual observations at the outfall, source identification and elimination of that source may be necessary as well as additional sampling.

## Sample collection

1. When possible, sample flow directly in a clean, wide mouth beaker (rinse dipper and beakers 2x with flow for conditioning). Dump the contents downstream from sample collection point.
2. Collect two samples: one for the field meter analyses and one for the test strips.
   Note: I use the beaker for one sample and the dipper for the second.

## pH, Temperature, Total Dissolved Solids (TDS) and Conductivity (Hanna Meter)

This meter should be calibrated periodically as per the instruction manual. If you cannot find your meter, there is a test strip for pH (below) and a basic thermometer will work.

1. Turn on the Hanna Instruments pH /Temperature/Conductivity meter.
2. Remove cap on probe and rinse the probe end with distilled water.
3. In the field, place the probe in the sample collected for on-site analyses.
4. Record the results on the Monitoring Locations Inspection and Sampling Field Sheet.
5. Rinse the probe with distilled water and replace the cap. **For extended time of storage, probe cap must be filled with pH Electrode Storage Solution or pH 4 Buffer solution.** Detailed instructions in folder see ***Care and Storage of pH Electrode***.

## Test Strips

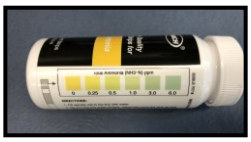
When using test strips, keep wet fingers out of the container. Close cap tightly after use.
Store in a cool, dry place.

### Ammonia (HACH # 4315-70)

Ammonia levels are tested to indicate presence of **sanitary sewage** in stormwater. Should high levels be detected, further investigation and source track down are required. If the illicit discharge is clearly and discernably sewage, sampling is not necessary.

1. Dip strip into water sample.
2. Vigorously move it up and down in water sample for 30 seconds, making sure both pads are always submerged.
3. Remove test strip and shake off excess water.

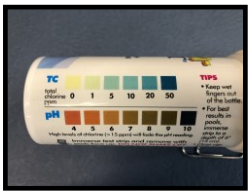
4. Hold the strip level, with pad side up, for 30 seconds.
5. To read the result, turn the test strip over so that both pads face away from you.
6. Compare the color of the small pad to the color chart on the container.
7. Read the result through the clear plastic of the test strip.
8. Record the result on the Monitoring Locations Inspection and Sampling Field Sheet.



## pH and Total Chlorine (LaMotte # 5049-36)

pH is measured to indicate **potential industrial discharges**.
Total chlorine is measured to indicate a **tap water** leak into the storm sewer system or possibly discharge of chlorinated **pool/spa water**.

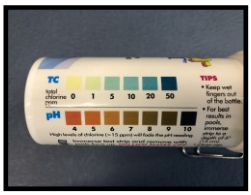
1. Immerse test strip and remove with pads face up.
2. Do not shake off excess water.
3. Wait 15 seconds and immediately hold up vertically against the color chart on container.
4. Record the pH result on the Monitoring Locations Inspection and Sampling Field Sheet.
5. Using the same strip, record the results for Total Chlorine



## Nitrite and Nitrate (LaMotte # 5049-39)

Sources of nitrite ($NO_2$) and nitrate ($NO_3$) in urban stormwater runoff include **lawn and garden fertilizers, pet waste and failing septic tanks**.

1. Using at least a cup-size sample, immerse test strip for 2 seconds and remove with pads face up.
2. Do not shake off excess water.
3. Wait 60 seconds and immediately hold up vertically against the color chart on container.
4. Record the Nitrite result on the Monitoring Locations Inspection and Sampling Field Sheet.
5. Using the same strip, record the results for Nitrate.



## Phosphate (HACH # 4315-75)

Sources of phosphate/phosphorus in urban runoff include **plant and leaf litter, soil particles, pet waste, road salt and lawn fertilizer**. Lawns and roads account for the greatest loading.

1. Dip a strip into water for 5 seconds and remove.
2. Hold the strip level, with pad side up, for 45 seconds.
3. Do not shake excess water from the strip.
4. Compare the color of the small pad to the color chart on the container.
5. Record the result on the Monitoring Locations Inspection and Sampling Field Sheet.

## Additional Testing

### Detergents – Black Light/Cotton Pad

Indicates presence of optical brighteners, used in detergents to whiten fabrics, which fluoresce under ultraviolet light. Sources of detergents include failing septic systems, improperly connected laundry discharges and industrial sources.

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1. Soak cotton pad with sample.
2. Place under black light. If it fluoresces, detergents are present.
3. Under bright light conditions, you may have to move to a dark area or devise a box to block light.
4. Record the detection or absence of detergents on the Monitoring Locations Inspection and Sampling Field Sheet.

Note: If an intermittent discharge is suspected, the cotton pad can be secured at the outfall or an upstream point (such as suspended in a storm DI) for a given length of time during dry weather before black light exposure. A suet feeder cage works well.