Instructions for Conducting Outfall Inspections

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ATTACHMENTS

Attachment 2 – Updating the Stormwater Outfalls Database With ArcPad 7.1 (Version 2.0, June 2012).

Attachment 3 – Updating the Stormwater Outfalls Database With ArcPad 10.0 (Version 1.0, June 2012).

Attachment 4 – Outfall Inspection Form (blank).

Attachment 5 – Example of Completed Outfall Inspection Form.

Attachment 6 – Outfall Inspection Summary Form (blank).

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Attachment 8 – Regional Outfall Inspection Compilation Form (blank).

Attachment 9 - Example of Completed Regional Outfall Inspection Compilation Form

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Background

New York State Department of Environmental Conservation State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges for Municipal Separate Storm Sewer Systems (MS4s), GP-0-10-002, (http://www.dec.ny.gov/docs/water_pdf/ms4gp2010.pdf) requires that stormwater outfalls be inspected. The deadline to complete the inspections is the expiration date of GP-0-10-002, which is April 30, 2015.

State DOTs are specifically designated as regulated MS4s (see the “Definitions” section for the definition of “MS4”) by USEPA. NYSDEC, the agency that implements the national stormwater program in New York State, has designated NYSDOT as a Non-traditional Regulated MS4.

SPDES GP-0-10-002 requires that regulated MS4s develop a stormwater management program that includes an Illicit Discharge Detection and Elimination Program. Inspection of drainage outfalls is one component of this program. The purpose of this is to verify that pollutants that may be entering the NYSDOT drainage system are not being discharged from the system into waterbodies, thereby polluting them. When such discharges are found, NYSDOT should take steps to eliminate the pollution from entering the waterbody. Although this is beyond the scope of the outfall inspection process, the protocol to eliminate suspected illicit discharges is discussed in the Environmental Handbook for Transportation Operations (https://www.dot.ny.gov/divisions/engineering/environmental-

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For illicit discharges that originate from a source outside of the ROW, NYSDOT shall notify the appropriate regulatory agency to contact the offender for elimination of the discharge. NYSDOT staff, however, should be confident that these discharges are, in fact, illicit before notifying the appropriate agency.

NYSDOT’s coverage under the MS4 general permit is limited to areas that are designated by NYSDEC as Urbanized Areas. These areas in New York State are shown on Figure 1. These urbanized areas can be found in every NYSDOT region, with the exception of Region 7.

During the time period from 2005 to 2008, outfalls were located within the NYSDOT Right-of-Way in these urbanized areas. A total of 18,184 outfalls were identified. A database of these outfalls locations was submitted to NYSDEC in 2008. This data is also on the NYS GIS Clearinghouse at [http://www.nysgis.state.ny.us/](http://www.nysgis.state.ny.us/).

The breakdown of the number of outfalls in each region is shown on the map in Figure 2.

![Map of New York State showing the Distribution of NYSDOT Stormwater Outfalls by Region](image)

**Figure 2.** Map of New York State showing the Distribution of NYSDOT Stormwater Outfalls by Region

The SPDES MS4 general permit requires that regulated MS4s “conduct an outfall reconnaissance inventory, as described in the EPA publication entitled Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical

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Assessments…” ([http://www.epa.gov/npdes/pubs/idde_manualwithappendices.pdf](http://www.epa.gov/npdes/pubs/idde_manualwithappendices.pdf)). The portion of this manual that addresses outfall reconnaissance is Chapter 11: “The Outfall Reconnaissance Inventory, which is included in this document in Attachment 1. This guidance document is consistent with the guidance in the EPA manual; therefore, NYSDOT considers this outfall inspection protocol to be in compliance with current NYSDEC permit requirements.

**What is an Outfall?**

The SPDES MS4 General Permit defines an “outfall” as “any point where a municipally owned and operated separate storm sewer system discharges to either surface waters of the State or to another MS4. Outfalls include discharges from pipes, ditches, swales, and other points of concentrated flow. However, areas of non-concentrated (sheet) flow which drain to surface waters of the State or to another MS4’s system are not considered outfalls and should not be identified as such on the system map.”

**Types of outfalls**

During the original outfall mapping in 2005-2008, the outfalls mapped were put into thirteen (13) categories, or types, including:

1. Ditch
2. Pipe – When the outfall mapping was done, there was no clear guidance as to the differences between a “pipe” and a “culvert pipe”. As a result, outfalls that are some type of a pipe may be shown in the database as either a “Pipe”, a “Culvert: Concrete Pipe”, a “Culvert: Corrugated Metal Pipe”, or a “Culvert: Polyethylene Pipe”. Because the types of outfalls in the database are based on a subjective interpretation, persons conducting the outfall inspections are not expected to confirm that the outfalls in the field are of the same type as shown in the database and on the outfall inspection maps.
3. Storm Water Facility – An outlet from a permanent facility constructed to address stormwater management issues immediately adjacent to a waterbody is considered an outfall.
4. Pump House – a small building for housing pumps, pressure tanks and motors. Stormwater is pumped from one location to a waterbody.
5. Gutter
6. Underdrain
7. Culvert: Concrete Box – See “Pipe” (#2, above).
8. Culvert: Concrete Pipe - See “Pipe” (#2, above).
11. Scupper –Because bridges can have too many scuppers to easily count or map, persons involved in the original outfall mapping were instructed to show the scupper as a single point near the center of the structure, and to indicate in the database how many scuppers are on the bridge. As long as the stormwater is discharged from these scuppers to the
same waterbody, all of the scuppers shall be mapped as one outfall. For purposes of this inspection, if there are no liquids, fluids, or illicit materials on the surface of the structure (i.e., the roadway surface is dry), it can be assumed that there are no discharges from the scuppers.

12. Abutment Drain

13. Other – This could include any surface or subsurface drainage connections from the state Right-of-Way to the jurisdiction of another regulated MS4 that is a type not already listed above.

Most pipes that discharge stormwater from the highway “daylight” in the highway embankment in close proximity to the waterbody. Ditches and pipes are the most common types of outfalls. Be aware that some pipes may discharge to a waterbody through a bridge abutment or wall of a cross-culvert that conveys a stream. Similarly, stormwater in ditches, swales, or gutters may discharge stormwater by dropping the stormwater through a grate directly into a waterbody.

A culvert that conveys a stream or other waterbody considered a Water of the State is not an outfall. Daylighted underdrains are considered stormwater outfalls only where the underdrain discharges directly to a waterbody.

Although scuppers on a bridge will be mapped as a single outfall, each swale, ditch, or gutter shall be mapped as separate outfalls, even when they are in close proximity to each other, such as around bridges. For example, if there are ditches that discharge to a stream in four quadrants of a bridge, each ditch outlet to the stream should be mapped as an outfall.

If the discharge from a potential outfall is delivered to a waterbody as concentrated flow, whether directly or by end section, stone apron, or if the earth beyond the discharge point is eroded such that it is reasonable that the water discharges to the waterbody in concentrated flow, that discharge point shall be considered an outfall.

The sketches in Figures 3 and 4 illustrate some situations where drainage outlets are considered outfalls.

**How to Conduct Outfall Inspections**

There is no one correct way to conduct outfall inspections. This guidance will discuss two different ways of documenting these inspections. The methodology used may depend greatly on the skill sets of the inspectors (e.g., knowledge of GPS and/or GIS, etc) and whether the inspector was involved in the original outfall mapping effort (and thus has previous knowledge of the outfall database and the methodologies used to locate and document the outfalls).

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**Example 1** - Direct discharge to a Water of the State, via a pipe or culvert. These drainage outlets are outfalls because there is concentrated flow directly to the waterbody within the ROW.

**Example 2** - Direct discharge to a Water of the State, via a ditch. This drainage outlet is an outfall because there is concentrated flow directly to the waterbody within the ROW.

**Example 3** – The outfall is located at the ROW line because that is the point at which concentrated flow leaves NYSDOT jurisdiction before eventually discharging to Waters of the State.

**Example 4** – This outfall is located at the point of concentrated flow discharged to the wetland. Regardless of whether the wetland is considered a Water of the State, the wetland is hydrologically connected to a Water of the State.

**Figure 3.** Examples of stormwater outfalls.
Example 5 – This example illustrates a situation in which there is a drainage connection from one regulated MS4 to another. The location of the outfall is where the concentrated flow leaves NYSDOT jurisdiction.

Example 6 – This example illustrates a situation in which closed drainage extends from the NYSDOT jurisdiction (MS4 (R)) to a non-regulated MS4 (MS4 (N)). The location of the outfall is where the concentrated flow leaves NYSDOT jurisdiction.

Figure 4. More Examples of stormwater outfalls.

In order to identify outfalls where illicit discharges (i.e., discharges not entirely composed of stormwater) are occurring, it is required that there be a minimum of 48 hours between the end of the last rain event in excess of 0.5 inches and the outfall inspection (it is not necessary to wait 48 hours after a snow event of 0.5 inches or more). Several sources can be used to determine the amount of rainfall at any one geographic area. One source on the internet is Weather Underground (www.weatherunderground.com). This website can be used to determine not only how much rain fell at one location, but also the approximate time when the rain event ended. The intent of doing the inspection when rain is not falling is so that, if there is a discharge, the likelihood of that discharge being rainwater is minimal. Therefore, water or other types of fluid that do discharge at the outfall can be attributed to another source. Discharges can come from natural sources, such as groundwater or seeps, or can originate from agricultural, commercial, industrial, or residential sources. The main purpose of this inspection program is to identify outfall discharges that are clearly polluted or contaminated. The presence of discharges that appear to be water (even turbid water) should not be “flagged” as potential illicit discharges. There is no need to sample discharges to confirm the presence or absence of an illicit discharge.

Equipment that might be helpful during the outfall inspection process can include a machete, tape measure, flashlight, camera, these instructions, GPS unit, laptop computer, and maps and forms.

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Method #1 – Use of GPS to Locate and Inspect Outfalls

Most, if not all, outfalls located by NYSDOT (and since placed into a master database) were located using Global Positioning System (GPS) technology. The database can be found at: P:\GIS\Environmental\StormwaterOutfall\Region(x)\Stormwater_Updates\Outfalls_Update.gdb (Replace the “(x)” with the appropriate region number). Data Dictionaries were created in order to capture the information requested during the inventory process. If the inspectors are knowledgeable in the use of GPS, the outfall inspections can be conducted by downloading the database information to the GPS unit (See Attachment 2, “Updating the Stormwater Outfalls Database With ArcPad 7.1 (Version 2.0, June 2012).” If ArcPad 10.0 is being used, the instructions for downloading the database information to the GPS unit can be found in Attachment 3, “Updating the Stormwater Outfalls Database With ArcPad 10.0 (Version 1.0, June 2012).” These manuals can also be found at: P:\GIS\Environmental\StormwaterOutfall\Manuals.

New “Update Fields” have been added to the database to address inspection issues. When inspecting the site using GPS, the fields that should be used are:

A. INSPECTION_RESULTS – This field has the following dropdown choices:
   1. Inspected. No suspected illicit discharge.
   2. Inspected. Suspected illicit discharge found.
   3. No outfall located.

B. INSPECTION_DATE

C. INSPECTION_FOLLOW-UP - This field has the following domain values:
   1. Suspected illicit discharge reported to agency.
   2. Suspected illicit discharge eliminated
   3. Other (See Inspection Comments). – This could mean anything other than what is described in the first 2 options. It could mean that there has been no action, or it could mean that a second inspection of a suspected illicit discharge was done, and it was found that there was no illicit discharge; therefore, neither of the first 2 options would be appropriate. (If this was the case, the dropdown choice in “INSPECTION_RESULTS” should be revised accordingly.) If neither of the first two choice are appropriate, then select “Other” and place your explanation in the “INSPECTION_COMMENTS” field.

D. INSPECTION_COMMENTS – This field can be used to record information about various items, including information regarding contacts with regulatory agencies, details about illicit discharge elimination efforts, or descriptions of suspected illicit discharges. The wording should be carefully chosen so as not to imply that there is definitely a confirmed illicit discharge present at the site. If information about a suspected illicit discharge is recorded here, the nature of the discharge should be described (e.g., sanitary waste, chemicals or petroleum, etc) and state that the site warrants further investigation. Having this

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documentation allows follow-up as time and resources allow. (Note: This information is not shared with agencies outside of NYSDOT).

E. INSPECTOR_NAME

In addition to those fields, other fields, such as “OUTFALL_CONDITION”, “STRUC_REPAIRS_NEEDED” (Structural Repairs Needed), and “GEN_MAINTENANCE_NEEDED” can be updated if appropriate and if the inspector is qualified to make these determinations.

Once the inspection data is obtained, staff in the NYSDOT regional office that has been granted access to the database can make these updates.

An alternative to using GPS is the use of a laptop in the field to update the database directly. This may involve copying a portion of the database onto the laptop (for sites to be inspected), then updating the master database in the office at a later time.

The advantage of using GPS to record inspection data is that it can save time by allowing a direct import of the data to the database. The disadvantage is that the Office of Environment is currently not staffed to provide technical support for GPS or GIS issues.

Method #2 – Use of Paper Maps and Forms to Locate and Document Outfall Inspections

The second method for recording outfall inspection data is to use paper maps and inspection forms. This allows inspections to be done by staff with no prior knowledge or experience in GPS and/or GIS. It is also a viable method, considering that the Office of Environment is currently not staffed to provide GIS and GPS support. (Previously, the Office of Environment had staff expertise and resources in GIS and GPS to develop and maintain the database. That resource does not currently exist.)

All of the outfalls are shown in a series of maps (in PDF format) and can be found at: P:\GIS\Environmental\StormwaterOutfall\Stormwater Maps. There is also a key map that shows all of the maps in an urbanized area. As an example, the key map for the Ithaca Urbanized Area is shown in Figure 5. One of the maps showing outfall locations in the Urbanized Area is the Ithaca East, U27N, and is shown in Figure 6. The urbanized area is shown in the gray area. The outfall maps show all of the outfalls previously located, and have unique identifying symbols for each type of outfall. Some maps also show reference marker locations.
Figure 5. Map of the Ithaca Urbanized Area, showing the locations of the other outfall maps.

Figure 6. Outfall Map “Ithaca East, U27N” within the Ithaca Urbanized Area.
Forms for Recording Outfall Inspection Information

1) Outfall Inspection Form

The Outfall Inspection Form (found in Attachment 4) is used to document that outfalls have been inspected. A separate form should be completed for each outfall inspected. There are seven pieces of information requested to complete the form:

1. Has it rained at this inspection site within the last 48 hours (i.e., has a rain event of 0.5 inch or more ended within the last 48 hours)? YES or NO.

   If a rain event at this location (totaling 0.5 inches or more) has ended less than 48 hours from the time of the inspection, the inspection of the outfall at this location should wait until a later time (it is not necessary to wait 48 hours after a snow event of 0.5 inches or more because there is far less chance of having runoff that soon after a snow event).

2. NYSDOT Outfall Map Number.

   This is the Outfall Map number shown in the upper right-hand corner of the paper map. This number is the USGS Quad map name (Ithaca East, U27N), and is shown in red in Figure 7.

3. Route.

   This is the route number or road name shown on the outfall map along which the outfall is located.

4. NYSDOT Outfall ID Number.

   This is a number that is placed on the paper outfall map by the inspector. When outfalls are inspected, a number should be written on the map and this number is placed on the form here. In order to reduce the chance of having duplicate ID numbers on the same map (which can happen if inspections are done in teams), the outfall ID number should include the route number. Figure 7 illustrates how outfall ID numbers can be placed on the map, showing numbers 366-1 through 366-6 on Route 366, and numbers 13-1 and 13-2 on Route 13 on Outfall Map U27N.
5. Inspection Results. Place an X next to ONE of the following:

_____ 1. This outfall has been inspected. There is no suspected illicit discharge. *Definition of Outfall* – Any point where a municipally owned and operated separate storm sewer system discharges to either surface waters of the State or to another MS4. Outfalls include discharges from pipes, ditches, swales, and other points of concentrated flow.

_____ 2. This outfall has been inspected. A suspected illicit discharge was found.

_____ 3. There is no outfall at the location shown on the map.

_____ 4. A feature was located, but it does not meet the definition of an outfall.

_____ 5. The outfall is underground. Inspection is not feasible.

This question is asked so that the “outfall” can be removed from the database if whatever feature at the location doesn’t meet the definition, or there simply is no recognizable feature at the location. If the inspector does not consider him/herself qualified to determine that a feature is not an outfall (or just chooses not to), then “1” or “2” should be selected. In this

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case, the outfall should remain in the database. If “2” is selected, this location should be noted in the Outfall Inspection Summary Form and be noted in the Outfall Database.

6. If 5.2. above is checked, describe the discharge (include color, odor, presence of foam, sheen, or solids):

This section should be used to describe the material coming out of the pipe.

7. Is this feature hydraulically functional and structurally stable? YES or NO. This section can be used to describe what maintenance is required (e.g., structure repair, erosion/scour repair, sediment removal, tree/brush removal, etc), even if the structure is hydraulically functional and structurally stable.

When the outfall mapping was done, certain attributes of the outfalls were recorded for asset management purposes. The outfalls were evaluated for possible maintenance needs so that NYSDOT could query the database for a list of outfalls that had need some type of maintenance. This inspection allows the inspector another opportunity to identify current maintenance needs.

These forms should be given to regional staff that will input the information into the master database.

An example of a completed form is in Attachment 5.

2) Outfall Inspection Summary Form

NYSDOT is required to report to NYSDEC the number of outfalls inspected on an annual basis. If the inspection information is input to the master outfall database, the number of outfalls can be tracked and reported. If the inspection information is not input to the database, the regions should maintain a count of the outfall inspections conducted. One way to do this is to have the inspector complete an Outfall Inspection Summary Form (found in Attachment 6). This will allow the region to keep track of the number, locations and dates of the outfall inspections for future reference. This can also be used to deliver information to the person in the region who will input the information into the database, thereby reducing the amount of paperwork received by the GIS staff person.

An example of a completed form is in Attachment 7.

3) Regional Outfall Inspection Compilation Form

This form can be used to compile all of the inspection information onto one form. This form (found in Attachment 8) will be especially useful if the inspection information is not input into the database by regional staff. If this is the case, this form can be submitted to the

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Environmental Science Bureau for its information when reporting inspection results to DEC. The following information can be compiled when using this form:
1. Number of Outfalls inspected
2. Number of outfalls not inspected
3. Number of suspected illicit discharges found
4. Number of suspected illicit discharges investigated
5. Number of illicit discharges confirmed
6. Number of illicit discharges eliminated

An example of a completed form is in Attachment 9.

Definitions
The following definitions are taken from the NYSDEC General Permit for Stormwater Discharges from MS4s, GP-0-10-002:

Discharge(s) – Any addition of any pollutant to waters of the State through an outlet or point source.

Illicit Discharges – Discharges not entirely composed of stormwater into the small MS4, except those identified in Part 1.A.2 [of SPDES GP-0-10-002]. Examples of illicit discharges are non-permitted sanitary sewage, garage drain effluent, and waste motor oil. However, an illicit discharge could be any other non-permitted discharge which the covered entity or Department [NYSDEC] has determined to be a substantial contributor of pollutants to the small MS4.

MS4 – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
1. owned or operated by a State, city, town, village, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA, that discharges to surface waters of the State;
2. designed or used for collecting or conveying stormwater;
3. which is not a combined sewer; and
4. which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Outfall – Any point where a municipally owned and operated separate storm sewer system discharges to either surface waters of the State or to another MS4. Outfalls include discharges from pipes, ditches, swales, and other points of concentrated flow. However, areas of non-concentrated (sheet) flow which drain to surface waters of the State or to another MS4’s system are not considered outfalls and should not be identified as such on the system map.

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