

December 29, 2017



Illicit Discharge, Detection and Elimination (IDDE) Program



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INTRODUCTION

Protecting the quality of stormwater runoff is important to the city of Thornton, and is required by the Colorado Discharge Permit System (CDPS) Regulations. The policy described in this program is pursuant to city code and the Municipal Separate Storm Sewer System (MS4) Permit from the Colorado Department of Public Health and Environment (CDPHE). The CDPHE, Water Quality Control Division (WQCD), through the MS4 permit issued to the city, requires the city to control and reduce the discharge of pollutants to protect stormwater quality and to satisfy the appropriate water quality requirements of the Colorado Water Quality Control Act and the Colorado Discharge Permit Regulations (Colorado Regulation 61). The MS4 permit requires the implementation of a program to track, evaluate, report and remove illicit discharges. The process herein is a description of how to detect and address non-stormwater discharges, including illicit discharges and illegal dumping. This process describes priority areas likely to have illicit discharges, how to trace the source of an illicit discharge and how to remove and respond to the source of the discharge with enforcement if needed.

Storm water pollution from point and non-point sources is a challenging water quality problem. Unlike pollution from industry or sewage treatment facilities, which is caused by a discrete number of sources, stormwater pollution is caused by the daily activities of people everywhere. Rain water and snow melt runoff from streets, lawns, farms, construction, and unregulated industrial sites pick up fertilizers, dirt, pesticides, oil, and many other pollutants on the way to streams, rivers, and lakes. This program has been created to assist city staff in locating priority areas for illicit discharges, educate staff on illicit discharge recognition, and assist with the reporting of suspected problems.

DEFINITIONS

Illicit connection: an illicit connection is any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections.” Examples of illicit connections include (but are not limited to) the following:

- Sanitary sewer piping that is connected directly from a building to the storm sewer system;
- A basement or shop floor drain that is connected to the storm sewer system; or
- A cross connection between the municipal sanitary sewer and the storm sewer system.

Illicit discharge: any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges specifically authorized by a Colorado Discharge Permit System permit, or discharges resulting from emergency firefighting activities.

Inspector: the person designated by the city to fulfill the responsibilities that have been empowered with such position.

Point source: means any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. "Point source" does not include irrigation return flow.

Pollutant: means dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, or agricultural waste.

Pollution: means the man-made, man-induced, or natural alteration of the physical, chemical, biological, and radiological integrity of water.

Storm drain, storm sewer: a drain or sewer for conveying surface waters, groundwater, subsurface water or water from any source other than sanitary sewer.

Storm water: any flow occurring, during or following any form of natural precipitation and resulting there from.

State waters: means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

TECHNICAL TERMS

BMP	Best Management Practice
GIS	Geographic Information System
GPS	Global Positioning System
IDDE	Illicit Discharge Detection and Elimination
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NOV	Notice of Violation
SIC	Standard Industrial Classification
SOP	Standard Operating Procedure
CWA	Clean Water Act

AGENCIES:

EPA	U.S. Environmental Protection Agency
CDPS	Colorado Discharge Permit System
WQCD	Water Quality Control Division of the CDPHE
CDPHE	Colorado Department of Public Health and Environment

SECTION 1: IDDE PROGRAM

Introduction

Discharges from MS4s often include wastes and wastewater from non-stormwater sources. Illicit discharges enter the MS4 through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by storm drainage in street, inlets, and drain outlets, or paint or used oil dumped directly into a drain or into street inlets). The result is untreated discharges that contribute high levels of pollutants, including heavy

metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to waters of the state. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

MS4 Permit Requirements

The WQCD's Phase II regulations and the MS4 permit state that an IDDE program must incorporate the following elements:

- Develop an MS4 map showing the location of all outfalls, and the names and locations of all waters of the state that receive discharges from those outfalls;
- A regulatory mechanism to implement and enforce the permit requirements to the extent allowable under state or local law. The regulatory mechanism must prohibit illicit discharges into the MS4 and implement appropriate enforcement procedures and actions, as needed;
- Develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the MS4;
- Procedures to respond to reports of and identification of illicit discharges. Identify and respond to illicit discharges observed during day-to-day normal work activities including reports of illegal dumping. Document and implement procedures, including the tools needed, to trace the source of an illicit discharge when identified within the MS4.
- The following excluded discharges do not need to be effectively prohibited and the city is not required to address the discharges as illicit discharges in accordance with the requirements of the permit.

Landscape irrigation	Springs	Footing drains	Discharges authorized by a CDPS or NPDES permit
Lawn watering	Flows from riparian habitats and wetlands	Individual residential car washing	Agricultural stormwater runoff
Diverted stream flows	Water line flushing	De-chlorinated pool discharges	Discharges in accordance with the Division's Low Risk Policy guidance
Irrigation return flows	Potable water discharges	Water incidental to street sweeping	
Rising ground waters	Foundation drains	Dye testing	
Uncontaminated groundwater infiltration	Air conditioning condensation	Stormwater runoff with incidental pollutants	
Uncontaminated pumped groundwater	Water from crawl space pumps	Emergency firefighting activities	

- Procedures for requiring cleanup from the operator and procedures for cleanup conducted by the city, when necessary, to remove materials associated with the illicit discharge.
- Enforcement procedures and actions to eliminate the source of an illicit discharge. The written procedures must address mechanisms for enforcement from the moment an illicit discharge is identified/reported until it is eliminated. Escalate enforcement as necessary based on the severity of violation and/or the non-cooperation by the responsible party to ensure that findings of a similar nature are enforced upon consistently. Written enforcement procedures must include informal, formal, and judicial enforcement responses.
- Locate priority areas with a higher likelihood of having illicit discharges, including illicit connections. At a minimum, the priority areas must include areas with a history of past illicit discharges.

- Train applicable municipal staff to recognize and appropriately respond to illicit discharges observed during typical duties.
- Maintain records for activities to meet the requirements of the permit.

The city of Thornton has incorporated the elements above within this manual, or through implementation of the MS4 Permit requirements. Application of the above elements will be addressed throughout this manual.

SECTION 2: Storm Sewer Mapping

Introduction

The city of Thornton GIS staff collect information from development and capital improvement projects in their efforts to continue in the development and updating of the outfall maps. These outfall maps include all the storm sewer system and facilities in the city, including detention and retention ponds. The outfall locations are noted in relation to drainage areas and waters of the state.

Mapping

Data for updating the storm sewer maps is collected from a variety of sources for input into the data collection process. The information is collected from the following resources:

Field Data Collection

Global Positioning System (GPS) is used to obtain the coordinates (longitude and latitude) for outfalls within older areas of the city where as-built drawings are not available. Visual verification of each new and existing outfall is key to maintaining accurate mapping data for all outfalls. Field visual inspections are conducted to verify the accuracy of the as-built data received for development and capital projects.

As-Built Data Collection

As-built drawings provide location as well as feature information in a concise manner. As often as possible, stormwater system data will be collected from as-built drawings for input into the mapping. This information will be added on the appropriate GIS feature layer and attributes of the stormwater feature will be added to the data collection table.

SECTION 3: Locating Priority Areas

Introduction

Locating priority areas will rely on accurate storm sewer maps, and knowledge of the land use, relative age of the storm sewer systems, the record of any previous public or staff notification of potential problem areas, and existing monitoring data that have identified areas of interest. Additionally, all complaints received by the city will be reviewed in order to identify areas where problems have been identified previously. Over the course of the permit term, priority areas will be part of active and on-going visual observation activities as part of a preventative program.

Identifying Priority Areas

The following guidelines will be considered for identifying areas of interest for the city of Thornton's service area:

- **Commercial/industrial areas.** These areas have been found in some communities' IDDE programs to (a) have significant numbers of illicit connections and/or (b) have discharges with a high potential to affect water quality. Specific business sectors can be prioritized if necessary (e.g., businesses subject to waste water pretreatment rules, businesses falling under certain Standard Industrial Classification [SIC] codes, or business sectors with a record of enforcement actions).
- **Older areas of the city.** Older development may predate more stringent construction codes regarding illegal connections and may have deteriorating sanitary sewer and/or storm sewer infrastructure that can lead to infiltration problems.
- **Areas where there have been repeated complaints.** Areas where illegal dumping or apparently contaminated discharges have been reported are obvious priority targets. The city's complaint process will assist with collecting data to support prioritizing areas where repeated complaints occur.

Priority Areas Identified

Using the guidelines provided above, city staff identified the following priority areas within city's service boundaries:

- Residential discharges throughout the city and restaurant discharge areas south of 104th Avenue.

SECTION 4: Regulatory Mechanism - Discharges

Introduction

The WQCD's guidance specifies a municipal ordinance or other regulatory mechanism created to comply with Phase II regulations must include a *prohibition* of illicit discharges and an enforcement mechanism. Note that it is also essential for the city to establish legal authority to inspect properties suspected of releasing contaminated discharges into the MS4.

Regulatory Mechanism

The city of Thornton has taken into account the legal authority granted to it under state law, the Phase II MS4 Permit requirements in Colorado, the enforcement methods the city deems appropriate, and any other locality-specific considerations. Consequently, through the Thornton City Code the city of Thornton is able to prohibit illicit discharges to its MS4, as well as enforce the elimination and mitigation of any illicit discharges that may occur.

The city of Thornton Neighborhood Services Code Compliance staff is available for consultation on the use of this Code to enforce the city's IDDE measure, and as the enforcing party, will be notified of significant infractions so they can investigate and bring enforcement actions to the situation if needed.

The city of Thornton through the following **legal regulatory mechanism** is able to prohibit and enforce the elimination of any illicit discharges that may occur:

- Sec. 18-658 unauthorized use of storm water system.
- Sec. 38-391 Abatement of nuisance.
- Sec. 38-395 Discharge of Nauseous Liquids
- Sec. 38-393 Nuisances enumerated.

Prohibited Discharges

The following are considered to be illicit (illegal) discharges to the MS4 within the city's service area (this list is not considered all inclusive):

Sanitary wastewater sources such as:

- Sanitary wastewater (usually untreated) from improper sewerage connections, exfiltration or leakage;
- Effluent from improperly operating or improperly designed septic tanks; and
- Overflows of sanitary sewerage systems.

Automobile maintenance and operation sources such as:

- Untreated (e.g., not treated through a well maintained oil/water separator) commercial car wash wastewaters;
- Untreated radiator flushing wastewaters;
- Untreated engine degreasing wastes;
- Improper disposal of oil, gasoline, and other automotive fluids;
- Automobiles leaking oil, gasoline and other automotive fluids with a significant puddling size and are located near streams, lakes or discharge point to the MS4.

Other sources such as:

- Laundry waste (solids or grey water);
- Non-contact cooling water;
- Metal plating baths;
- Dewatering of construction sites without a permit;
- Washing of concrete ready-mix trucks outside designated areas;
- Improper disposal of household toxic wastes;
- Spills from roadway and other accidents;
- Chemicals, hazardous materials, garbage, and sanitary sludge landfills and disposal sites;
- Commercial use of soaps and detergents; use in cleaning pavement, vehicles and equipment;
- Sediment from lack of or improper maintenance of erosion and sedimentation controls;
- Latex/oil-based paints & solvents;
- Trash and debris: littering and dumping, household or construction waste;
- Improper disposal of restaurant grease; and
- Yard waste

Allowed Discharges

The following non-stormwater discharges listed in the MS4 permit are allowed into the MS4 (this list is not considered all inclusive):

- Landscape irrigation
- Lawn watering
- Diverted stream flows
- Irrigation return flows
- Rising ground waters
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Spring
- Foundation drains
- Air conditioning condensation
- Water from crawl space pumps
- Footing drains
- Individual residential car washing
- Dechlorinated swimming pool discharges*
- Water incidental to street sweeping
- Dye testing

- Flows from riparian habitats and wetlands
- Waterline flushing*
- Potable water sources discharges*
- Stormwater runoff with incidental pollutants
- Emergency firefighting activities
- Authorized CDPS and NPDES permit
- Agricultural stormwater runoff

The following are non-stormwater discharges the city allows when the appropriate guidance is followed:

- Charity car washes **
- Power washing *
- Uncontaminated groundwater *
- Potable water *
- Fire safety maintenance activities *

** Charity car washes must have appropriate controls to prevent discharge to the storm drain or to sensitive water bodies (streams, lakes, rivers, etc.). All run-off water from the water source and cars must be either drained into a landscaped area or captured before entering the storm drain. Partnering with a local car wash association is recommended.

* CDPHE Documents WQP-27 Low Risk Discharges:

- Low Risk Discharge Guidance – Discharges from Surface Cosmetic Power Washing Operations to Land
- Low Risk Discharge Guidance – Discharges of Uncontaminated Groundwater to Land
- Low Risk Discharge Guidance – Discharges of Potable Water
- Guidance for Discharges from Fire Safety Maintenance Activities
- Low Risk Discharge Guidance – Swimming Pools

SECTION 5: Outfall Inspections

Introduction

The quality of stormwater entering the waters of the state within the city’s service area relies heavily on assigned personnel inspecting the storm sewer systems. Personnel trained in the detection of pollutants can prevent and help eliminate sources of impurities to the waterways. This program has been established to detect pollutants in storm sewer outfalls.

The city performs dry weather screening of its stormwater outfalls at least once during the MS4 permit term. The city will also conduct outfall screening in response to community complaints, as deemed appropriate.

Outfall Inspections

In most urban areas, the flow of water from a storm drain system is not a routine event during dry weather periods and, therefore, can be an indicator of illicit discharges (e.g., illegal dumping and unauthorized connections to the MS4). However, dry weather flows from an MS4 can be from other non-stormwater discharges that would not be considered an illicit discharge and are a normal event for some storm sewer outfalls (depending on location). These non-stormwater discharges could include: groundwater infiltration into the storm sewer system, irrigation return flow, foundation drain discharges, etc.

Using the assumption that dry weather flows are not conclusive indicators of possible illicit discharges in the city's MS4, outfall inspections will be conducted focusing on visually conspicuous evidence of possible illicit discharges to the MS4. Annual inspections shall be conducted throughout the city along major drainage ways where culverts and pipes have discharge points. Upon the inspectors discretion water quality sampling may be conducted. Outfalls should be inspected once every MS4 Permit term as directed by the permit.

Outfall Locations

The city has mapped the storm sewer outfalls located throughout the city's service area. This location information is kept in the city's GIS, along with other information pertaining to the outfall. As new outfalls are constructed as part of development or capital projects, electronic as-built information, including geo-spatial data, is used to update the GIS/Mapping database.

For the purposes of this manual, the terms "end-of-pipe" and "stormwater outfall" will be synonymous.

Visual Inspection Overview

This section contains an overview of major outfall visual inspections and inspection documentation procedures. Appendix A contains the visual outfall inspection report form and instructions.

Inspections shall be conducted along major drainage ways according to locations shown on the GIS outfall maps. The inspector shall inspect by looking upstream and downstream of the outfall. The inspector shall look for the presence of excessive sedimentation, trash or other debris, floating and suspended materials, oil and grease, discoloration, turbidity, odor, foam, or other indications of a potential for pollutants to contaminate storm water runoff. In addition, a visual inspection should include assessing the integrity of the storm water collection system including checking for leaks, seepage, and overflows from waste disposal sites.

Inspection Form Information

The inspection form provides a record of each site visit. Inspection forms shall be filled out electronically or on paper in the field for all inspections. If a site cannot be inspected, staff shall record an explanation of the circumstances on the form. The form and instructions for completion are presented in Appendix A.

Flagged Visual Inspection Forms

Inspection forms for sites are flagged in the system if end of pipes or ditches are greater than 50% filled with sediment or debris or if the grate is clogged more than 50%. Flagged forms are reported to Street Operations. Corrective maintenance will be performed on outfall sites as needed based on operations criteria. The maintenance activities are tracked by Street Operations.

Inspections identifying a suspected illicit discharge shall be reported for follow-up tracking/tracing of the discharge as described in Section 6.

Follow-up Inspections

Follow up inspections are conducted if additional maintenance activities are needed, the inspector will notify Street Operations for any additional maintenance and tracking.

SECTION 6: Illicit Discharge Reporting

Introduction

Illicit discharges and possible cross connections are identified through citizen reporting, interdepartmental or interagency referral, or other routine MS4 inspection activities. The city relies on local citizens, field staff, and inspections to detect potential problem areas quickly, so that they can be addressed before they cause significant water quality degradation.

A water quality incident/spill/trouble call number is available on the city web site to report concerns. This convenience encourages residents to participate in the reporting process and helps the city to receive timely information about problems like illegal dumping, spills, and other discharges.

The city's related storm sewer maintenance activities provide opportunities to document and identify potential problems that may not be obvious to the general public. Potential illicit discharge problems can be revealed through outfall inspections or reports from staff, tenants, or the public. When a complaint is reported, the city does a follow-up investigation. The follow-up investigation could include a site visit to look at the problem area, review of mapping information, review of past complaints or investigations at the location, or other data collection and review. Once a problem has been verified (either through a routine inspection or follow-up to a called-in complaint) the city will begin an official illicit discharge investigation, following the procedures outlined in this section. To respond to a report of an illicit discharge, the following procedure should be followed.

Documentation

Staff will take the initial information on the spill event and create a My Thornton Service Request. The service request should be forwarded to the Stormwater Coordinator or the City Engineer. If the Stormwater Coordinator or City Engineer is not available the call can be forwarded to Code Compliance.

Staff receiving the call should gather as much information as possible to assess the severity of the incident and determine if emergency response is needed. Follow the process below in Figure 6-1.

At a minimum collect the following information:

- Callers name and or agency (if applicable)
- Telephone number
- Location or address of the incident
- When the discharge was observed (date and time)
- A description of the incident or suspected discharge; oil, fuel, chemical, sediment, paint or any other substance. Note color, viscosity (thick like syrup or runny like water).
- Is the spill actively moving? Is there a storm drain, stream, river nearby?
- Person or name of company responsible for the discharge and all information related to the observed or suspected discharge.
- Has discharge ceased or has there been an attempt to stop the discharge?
- Should there be a concern for public safety or health, call 911 (Call Admin. Staff after calling 911).

After collecting the information, immediately contact Infrastructure Administrative staff for processing and assigning the request accordingly. Call the Engineering Services main line at 720-977-6210 and provide the information collected by phone or if requested by Administrative staff, provide the information by e-mail.

Infrastructure Administrative staff shall contact Neighborhood Services (Code Compliance) at 303-538-7517 or leave a detailed message. Administrative staff shall call the Stormwater Coordinator or City Engineer with the information, open a My Thornton Request as a Stormwater Discharge, and assign the request to the Stormwater Coordinator or designee. If assigned to designee, copy the Stormwater Coordinator.

After regular business hours contact dispatch at 720-977-5150. If discharge is of a hazardous nature or if there is concern for public safety or health, call 911.

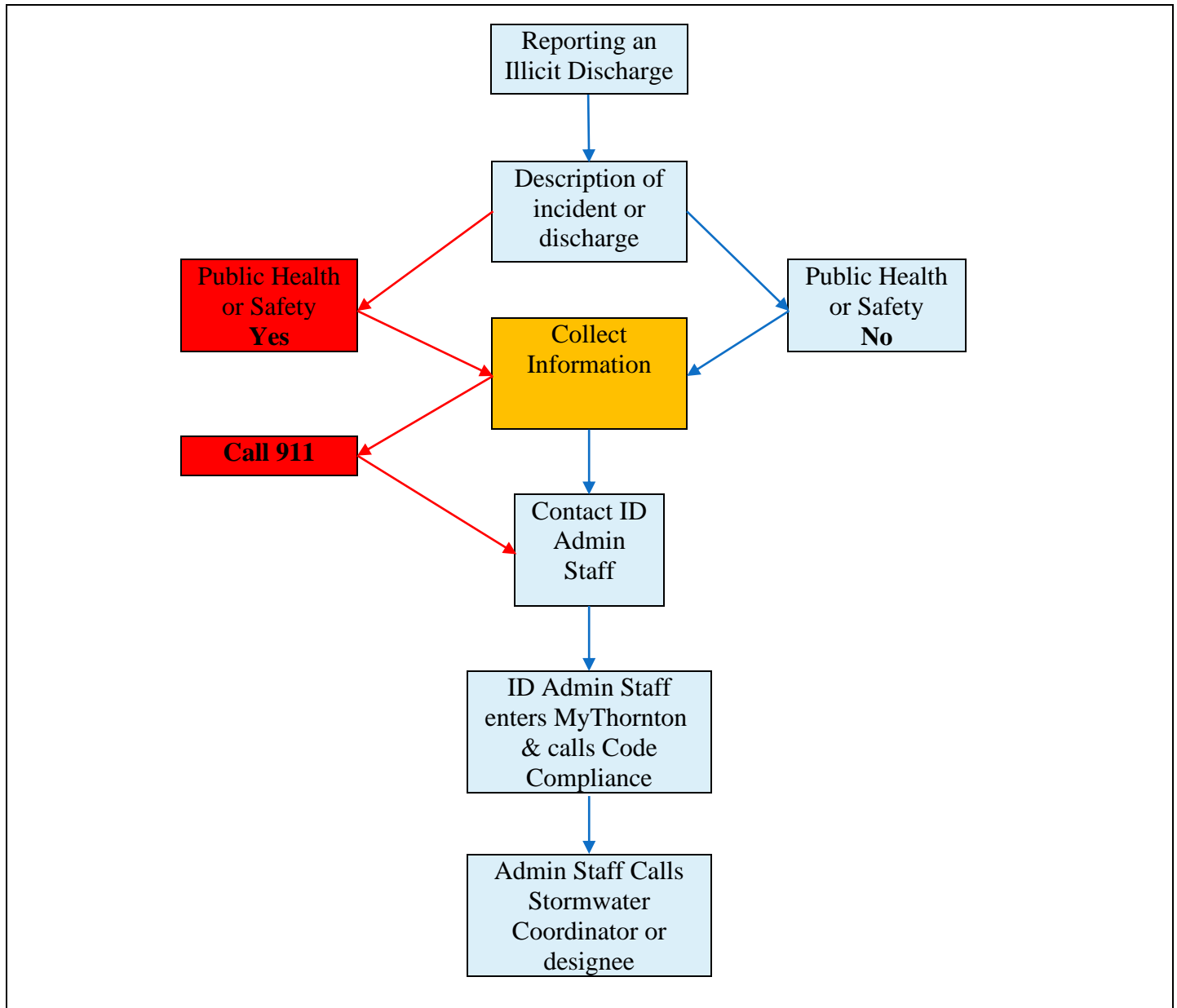


Figure 6-1. Steps for Information Assessment and Reporting

Investigation Procedures

Once recorded, incident information is referred to the appropriate city staff for follow-up. The follow-up investigation could include a site visit to look at the problem area, review of mapping information, review of past complaints or investigations at the location, or other data collection and review. Once a problem has been verified the city will begin an official illicit discharge investigation, following the procedures outlined in Figure 6-2 illustrating the steps to follow in investigating a citizen complaint or an outfall inspection.

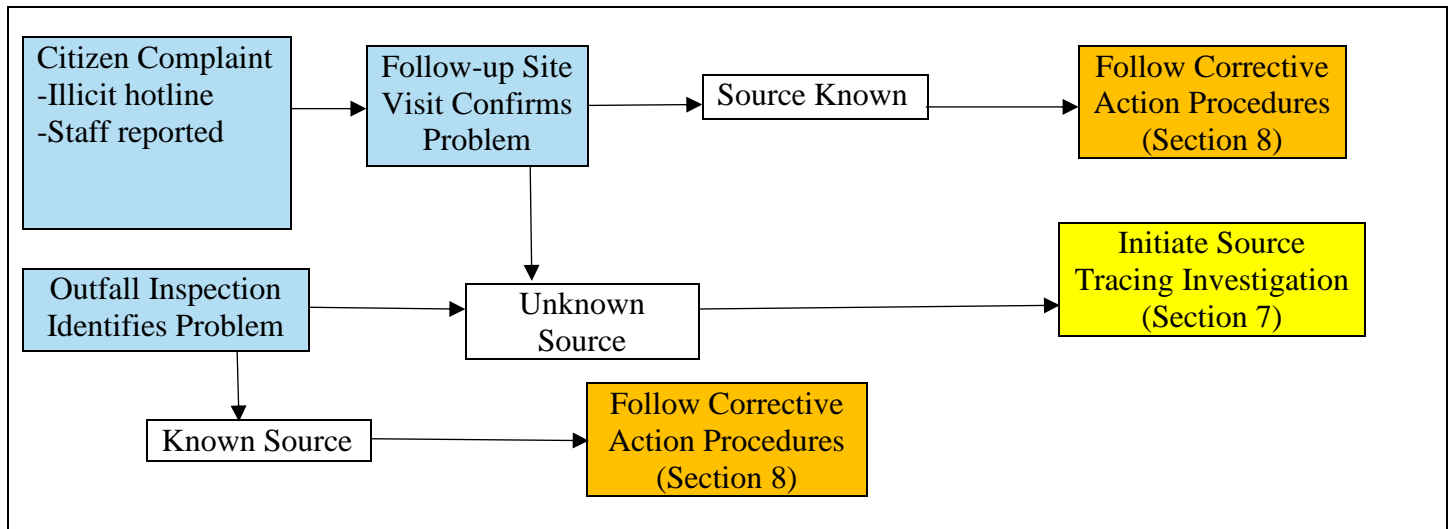


Figure 6-2 Steps for Investigating an Illicit Discharge

When an illegal dumping or illicit discharge problem is directly observed by city staff, it is generally not necessary to follow these investigation procedures. In those scenarios, the source of the problem discharge is already known. Problems revealed through direct observation are referred directly to the corrective action information in Section 8. In the event that a reported problem does not have a defined source, the procedures in Section 7 should be followed to trace the sources of the illicit discharge.

Field Investigation Report

In addition to filling out the electronic My Thornton report, a field report (Appendix B) must be filled out and a file should be created to include copies of the following, if applicable:

- GIS Inspection Map;
- Photographs;
- Field notes;
- Lab testing results, if needed;
- Proof of corrected problems (field investigation report).

Any field investigations, photographs, corrective actions, or other activities associated with the suspected problem area should be documented in My Thornton and in the field report. For discharges associated with construction activity, enforcement and corrective actions may be handled through the construction program but still recorded as an illicit discharge. This becomes the city's official record of the investigation performed by stormwater staff. Code Compliance has a separate notice form used for their investigations which is also an official record.

SECTION 7: Tracking and Tracing an Illicit Discharge

Introduction

Source tracing and tracking begins when a suspected problem area is identified through field assessment/testing, or a complaint call. When the source of the non-stormwater discharge is not known, one of two primary methods can be used to locate the source of an illicit discharge:

- Method A – Storm Drain Network Investigations
- Method B – Drainage Area Investigations

The method used will depend on the type of information collected or reported, level of understanding of the drainage network, and existing knowledge of operations and activities on the surrounding properties. All source tracing and tracking investigations should be documented and recorded in My Thornton and the field report (Appendix B).

Investigative Methods

Method A – Storm Drain Network Investigations

The source of some illicit connections or discharges can be located by systematically isolating the area from which the polluted discharge originates. This method involves progressive investigation at manholes in the storm drain network to narrow down the location where the illegal discharge is entering the drainage system. This method is best used to identify constant or frequent discharge sources such as an illicit connection from a sewer system into the storm drainage network.

Consult the drainage GIS maps and identify the major branches. If a drainage map is not available or major branches cannot be identified, then sketches of the system shall be made and the system shall be identified to GIS staff for adding to the city's drainage system map.

Storm drain network investigations include the following steps:

- Starting from the outfall or location where the illicit discharge is discovered, observe the next upstream manhole or junction to see if there is evidence of polluted discharge. As with the outfall inspections, field crews are looking for the presence of flow during dry weather, foul odors, colors or stained deposits, oily sheen, floatable materials, and/or other unusual observations.
- Repeat observations at each upstream manhole or junction until a junction is found with no evidence of discharge; the discharge source is likely located between the junction with no evidence of discharge and the next downstream junction.
- Work downstream from the “clean” manhole or junction to isolate the location where the polluted discharge is entering the storm drain system.
- If discharge is evident from private property initiate private property site entry procedures.
- Document all findings in field report.

When visual inspections are not enough to isolate the source of the illegal discharge, a number of additional field tests can be performed. The city may use the following methods if it is determined to be beneficial.

- Video Inspections

Mobile video cameras can be guided remotely through storm sewer lines to observe possible illegal connections into storm sewer systems and record observations on a videocassette or DVD. City staff can observe the videos and note any visible illegal connections. This technique is time-consuming and expensive but thorough and usually definitive, and it does not require the intrusion on members of the public that some of the other methods do.

- Smoke Testing

This technique involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines. Prior to performing this test, it is necessary to inform building owners and occupants in the area in advance. It is also advisable to inform the police and fire departments.

Smoke testing is typically used to survey an area all at once, in contrast to dye testing, which tests one building at a time.

- Dye Testing

This technique involves flushing non-toxic dye into toilets and sinks and observing storm sewer and sanitary sewer manholes and storm sewer outfalls for the presence of the dye. Prior to performing this test, it is necessary to inform building owners and occupants in advance and gain permission for entry. Local public health and state water quality staff should also be notified so that they will be prepared to respond to citizens calling about any dye observed in surface waters.

The test is relatively quick (about 30 minutes per test), effective (results are usually definitive), and cheap. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

Confirmed illicit discharge sources should be referred to the follow-up actions and corrective action procedures described at the end of this section.

Method B – Drainage Area Investigations

The source of some illegal discharges can be determined through a survey or analysis of the drainage area of the problem outfall. Drainage area investigations are particularly useful when the discharge observed at the outfall has a distinct or unique characteristic that can allow field crews to quickly determine the type of activity or non-point source that is generating the discharge.

In the event that the source of the discharge is unable to be identified the city will take action to stop the discharge and clean up the site. A My Thornton service request should be submitted to the proper party for cleanup depending on the nature of the discharge.

Follow-up Action

Once the source of an illicit discharge has been identified, the investigator should initiate private property site entry procedures (if needed), notify the property owner or operator of the problem, and provide the appropriate educational materials. If enforcement is necessary, Code Compliance should be contacted and they will issue a notice of violation. This is an important first step in the corrective action process. The investigator completes the information in My Thornton and the field report to document the findings.

SECTION 8: Enforcement and Corrective Action

Introduction

The city will respond to identified illicit discharges, illicit connections, or illegal dumping activities using progressive enforcement actions. Corrective actions will focus first on education to promote voluntary compliance and escalate to increasingly severe enforcement actions if voluntary compliance is not obtained.

Voluntary Compliance

The preferred approach to address illicit discharge problems is to pursue voluntary compliance through education of the property owner or responsible party. Often, business operators and property owners are not aware of the existence of illicit connections or activities on their properties that may constitute an illegal discharge. In these cases, providing the responsible party with information about the connection or operation, the environmental consequences, and suggestions on how to remedy the problem may be enough to secure voluntary compliance. Education begins during the site investigation when the operation or connection is first confirmed. Property owners and operators should be notified that the problems must be corrected in a timely manner and that the city will be conducting a follow-up site visit to verify compliance. Field staff may also provide the property operator with an educational brochure describing illicit discharge violations and a copy of the applicable City Code provisions. Field staff should also remind property owners of their obligation to report discharges to the proper agencies. When voluntary compliance does not produce the desired result, the city is required to pursue follow-up enforcement action. All enforcement actions will be the responsibility of Neighborhood Services (Code Compliance).

Enforcement Actions

When voluntary compliance does not produce the desired result, the city is required to pursue follow-up enforcement action. Table 8-1 and Figure 8-1 outline the detailed enforcement steps. More serious violations or continued non-compliance may warrant a more aggressive, enforcement oriented approach.

Enforcement Step	Details	Responsibility
Step 1 – Initial Actions	<ul style="list-style-type: none"> • Provide educational materials (i.e. brochure and copy of City Code). • Encourage voluntary compliance. • Provide copy of inspection report setting expected compliance date. • Additional staff support or technical assistance. • Request evidence of corrected problem (if applicable). • Site visit to verify compliance. 	Infrastructure Department or assigned staff
Step 2 – Follow-up Actions	<ul style="list-style-type: none"> • Leave a "notice of violation" with the property owner regarding unresolved issues. • Set second compliance date (determined on individual incident basis). • Site visit to verify compliance. 	Infrastructure Department/Code Compliance

Step 3 – Final Actions	<ul style="list-style-type: none">• Send second "notice of violation" indicating that unresolved issues will be referred to Code Compliance.• City may correct problems and send bill to property owner.	Infrastructure Department/Code Compliance
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**Figure 8-1
IDDE Enforcement Steps**

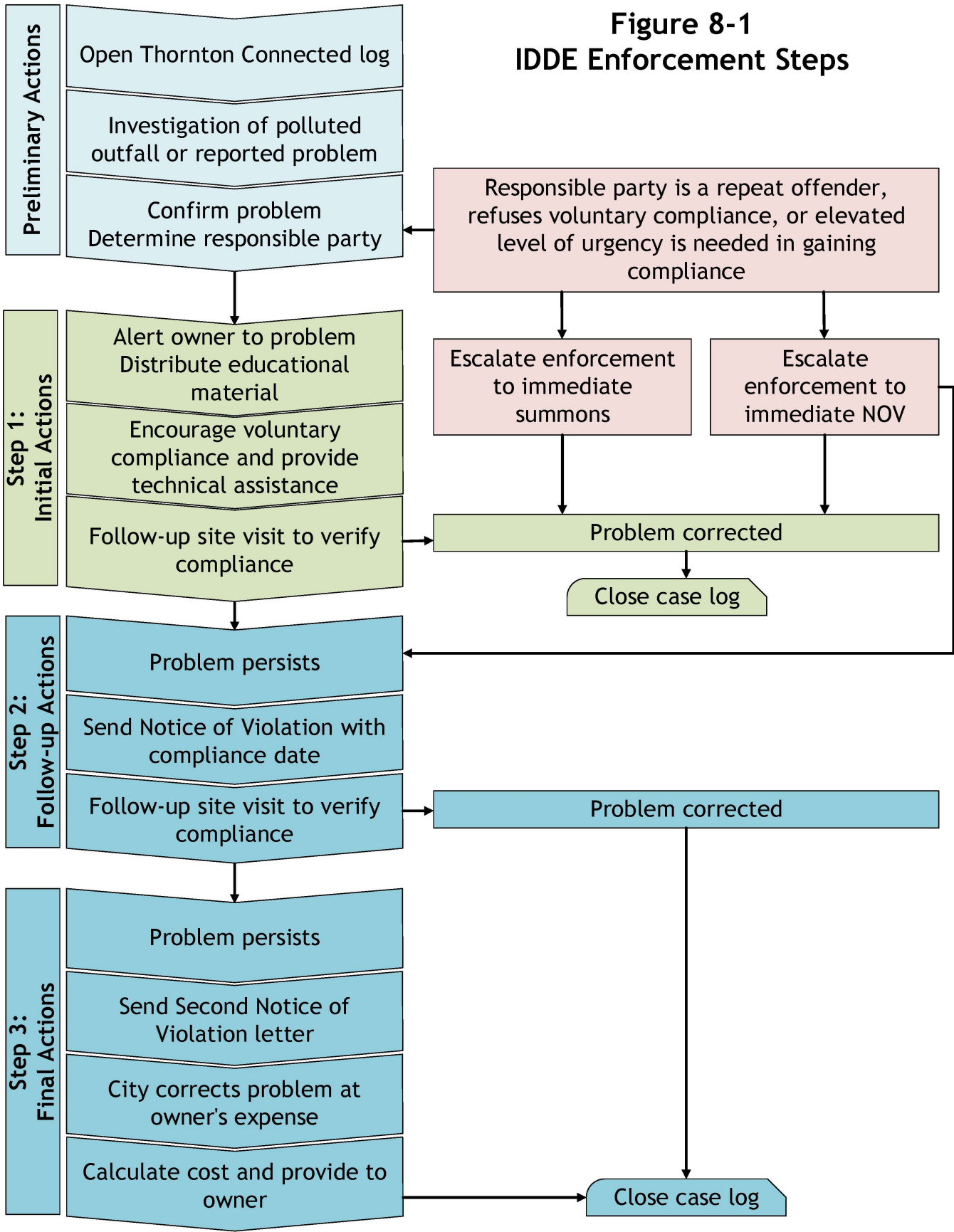


Figure 8-1 IDDE Enforcement Steps

Enforcement Timeline

The timeline of corrective action procedures is highly dependent on the nature of the violation and the responsiveness and cooperation from the person(s) responsible. The urgency of addressing identified problems will be based on the nature of the pollutant in question and potential impacts to downstream waters. Compliance dates should be included in all violation notices. In cases where repeated discharges occur, escalated enforcement in the form of an immediate NOV or court summons may be appropriate.

If property owners are not addressing problems in a timely manner, the city may step in (if deemed appropriate by Code Compliance and ID Engineering Services) and perform the repairs necessary to remove an illicit connection, eliminate an illicit discharge, and/or clean-up a dumping incident. Property owners will also be responsible for reimbursing the city for any costs incurred in correcting IDDE problems.

SECTION 9: Training

Introduction

City employees that have been trained to associate the link between their work and stormwater quality can assist in reducing the amount of stormwater pollution that is conveyed into receiving waters. In order for the city's illicit discharge, detection and elimination program to achieve success, employees must be trained on how to incorporate illicit discharge detection and elimination into their everyday activities.

Staff General Awareness Training

The training video for identifying and responding to illicit discharges is the primary tool for conducting general staff training. Other training materials may include information published by the EPA, the State of Colorado, or other sources. In addition, the city may encourage staff to attend off-site classes and workshops offered by other agencies and organizations, on related pollution prevention issues and practices.

Training and education of city staff is an important component of this program. City staff in Parks and Open Space, Street Operations, Code Compliance, Environmental Services, Engineering, and Utilities have received training on identifying and responding to illicit discharges. Training and education will be ongoing and conducted on an as needed basis.

Inspection Training

Training is required for all municipal field staff conducting IDDE inspections which may come in contact with or may observe an illicit discharge or illicit connection to the storm sewer system as part of the inspection process. City field staff has the responsibility of conducting inspections as part of a scheduled inspection or as needed. The training, at a minimum, consists of inspection personnel reviewing the inspection forms and the guidance sheets. Training materials may include the "Illicit Discharge Detection and Elimination" video, and review of this Manual.

SECTION 10: Record Keeping

Introduction

The MS4 Permit requires the city to maintain records of all stormwater program activities. Thorough record keeping is particularly important for a successful IDDE program. Records of past problems can help focus an

investigation in the right direction or identify repeat offenders. Thorough record keeping is also critical to the enforcement process.

Recorded Information

The MS4 Permit requires the following program activity record keeping:

- Storm Sewer System Map
- Regulatory Mechanisms; including codes, resolutions, ordinances and program documents.
- Documentation pertaining to Tracing Illicit Discharges.
- Documentation pertaining to Removing an Illicit Discharge.
- Enforcement Response documentation used to enforce codes, resolutions, ordinances, and program documents.
- Priority Area maps or list of priority areas.
- Staff Training documentation.
- Citizen Complaints – recorded in My Thornton
- Outfall Inspections – maintain field maps and inspection reports for potential illicit discharges or connections.
- Investigations – retain notes, photographs, conversation records, and lab testing results if available.
- Corrective Action – in addition to the information collected during the investigation process, retain copies of compliance letters, correspondence with property owners, and proof of corrected problems (photos and field investigation report).

Retention of Records

The MS4 permit requires that all IDDE program records be retained for a minimum of three (3) years from the date that the specific item is no longer being actively utilized for stormwater management. To facilitate this process the City will maintain the files as long as data storage availability allows past the required three years.

APPENDIX A

OUTFALL INSPECTION FORM AND INSTRUCTIONS

OUTFALL INSPECTION FORM AND INSTRUCTIONS

A separate form must be filled out for each inspection site. Fill out a new form if a formatted form with the appropriate location and asset number does not exist. Answer all questions on the form and comments as needed. At least two pictures shall be taken at each site, more as required.

FORM COMPLETION INSTRUCTIONS

General Information

1. **Site Name, Location:** Identify the subdivision as the site name, if the outfall is not located within a subdivision, identify it by the drainage basin into which it is discharging. Identify the site location by address if available or by nearest intersection.
2. **Date, Time, and Temperature:** Record the date and time and estimated temperature when performing the inspection.
3. **Inspected by, and Watershed:** Fill in the name of the employee conducting the inspection. Use the Storm Sewer System Outfall Maps to identify the watershed in which the drainage structure that is being inspected is located if it is not already noted on the inspection form.

General Observations

1. **Is there water flowing from End-of-Pipe?** Check the “No” box if there is no water flowing out of the end-of-pipe. Check the “Yes” box only if water is flowing out of the end-of-pipe. If you checked the “Yes” box, you also need to answer the questions about the quality of the water flowing out of the pipe. Check the appropriate boxes for the water quality questions.
2. **Is there standing water?** If you see standing water in the end-of-pipe or the end-of-pipe is submerged in water and you cannot determine if the water is actually flowing out of the pipe, check the “No” box.
3. **Is there evidence of erosion or other potential obstructions (grocery carts, furniture, etc.)?**

Water Quality

1. **Is there trash or debris accumulation that needs to be removed? (Trash/Debris)**
The trash and debris could be small items such as pop cans and plastic bags, or large items such as dumped refrigerators, bicycles, or construction debris such as stakes, silt fence, wood, and drywall. If you see any trash or debris piled up in or near the pipe check the “Yes” box. If construction debris is present check “Yes”.
2. **Is vandalism present? (Vandalism)**
Is there spray painted gang markings, expletive language or pictures present on the outfall? If so check “Yes”.
3. **Is there a smell associated with the water? (Odor)**
As you are near the water, do you smell rotten eggs or sanitary wastewater? If so, mark “Yes” and describe the smell if possible.
4. **What does the water look like? (Color and Turbidity)**

Imagine a glass of drinking water, you can see through the water and the water is not colored. Is this what the water flowing from the end-of-pipe looks like?

Colored: Imagine a glass of tea, you can see through the water, but the water is colored. Is this what the water looks like? Be careful not to let the color of subsurface objects fool you. For example, green algae under the water can give water the appearance of being green. Color can range from light to dark. If the water seems very lightly colored but you are in doubt, do not mark the “Yes” box.

Muddy: You cannot see through the water (it has a cloudy or muddy appearance).

If yes, are petroleum products present in water? Imagine pouring new or used motor oil into water. Do you see this effect in the water flowing from the end-of-pipe? Unless you see floating globs or a moving sheen of oil in the water mark “No”.

5. **Do you see anything, other than trash/debris, floating in the water? (Floatable Matter)**

Look for products from manufacturing such as animal fats, foam, plant parts, sawdust, etc. not your typical pop can or candy wrapper.

6. **Has sediment accumulated in or at the end of pipe? (Sediment)**

If sediment is present in the pipe check “Yes”. Then estimate how much sediment is present in the pipe (less than ¼ full, about ½ full, or more than ½ full of sediment). Note the possible source for the sediment either from construction near the site or unknown source.

7. **Are there any deposits or stains on the pipe wall? (Deposits/Stains)**

Look for a coating, stain, or residue on the wall of the pipe. A non-stormwater discharge will leave a deposit.

8. **Are there any unusual algae blooms present?**

Outfall Structure Conditions

1. **Does the pipe or structure show signs of damage; settling, cracking, sloughing or other problems?**

If any significant amount of damage is found check the “Yes” box and make a note of the damage. Check “No” if no damage is found.

2. **Is there evidence of animal burrowing or any other activity that may contribute to instability or erosion?** If any significant activity is noted check the “Yes” box and make a note of the finding. Check “No” if none is found.

3. **How does the vegetation look around the outfall? (Vegetation)** Some illicit discharges can kill the plants, others can accelerate the growth. If vegetation is impacted, look for chemicals like gasoline, oil, and antifreeze. If you notice no dead vegetation, then look for heavy growth of vegetation. There should be a noticeable difference between the vegetation at the outfall verses the surrounding vegetation, if so, check the “Yes” box and make a note of the finding. Check “No” if none is found.

4. **Is there significant blockage at the end of the pipe?** If vegetation, sediment or other obstructions are present check the “Yes” box and make a note of the finding.

5. **Is the outfall operating properly?** If manhole, frames and covers associated with the structure are operating correctly check the “Yes” box. If you notice damage or something impeding the operation check the “No” box and describe the situation.

Compliance Action Required/Completed

Compliance actions and completion are documented only when such action is required. Each incident or finding will be evaluated by city staff for the appropriate action to be taken.

FIELD EQUIPMENT CHECKLIST

Make sure you have the appropriate protective equipment before starting the inspection.

- Safety and communication equipment (i.e. safety vest, cell phone, business cards)
- Outfall location maps
- Clipboard
- Digital Camera
- Visual Inspection Forms
- Mosquito protection if needed
- Pen and/or Pencil
- Storm Sewer Locate Sheets
- Staff Phone Directory



Outfall Inspections

Site Name: _____

Structure ID: _____ Date: _____ Area: _____

Location: _____ Structure Type: _____

Inspected by: _____ Watershed: _____

Time: _____ am/pm Temperature: _____

General Observations

Comments

Is water flowing?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Standing water?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any evidence of obstructions or erosion in vicinity of the outfall structure?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Water Quality

Comments

Is there accumulation of trash, debris and/or litter to be removed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any signs of vandalism or other activity that could affect the outlet structure performance?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Odor, Color, Turbidity, Floatable Matter, Sediment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Deposits/Stains?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Unusual Algae blooms in outlet structure?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Outfall Structure Conditions

Comments

Does the pipe/outlet structure show signs of settling, cracking, sloughing or other problems?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Evidence of animal burrowing or other activity that could contribute to instability or increased erosion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Does vegetation around outlet structure need thinning, i.e. cattails, willows, trees?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Is the pipe/outlet structure clogged or obstructed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Are the manholes, frames, and covers associated with the outfall in appropriate condition?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Compliance Action Required/Completed:

APPENDIX B

ILLICIT DISCHARGE INSPECTION FORM AND INSTRUCTIONS

ILLICIT DISCHARGE INSPECTION FORM AND INSTRUCTIONS

A separate form must be filled out for each inspection site. Answer all questions on the form and add comments as needed. At least two pictures shall be taken at each site, more as required.

FORM COMPLETION INSTRUCTIONS

General Information

1. **Site Name:** Identify the site name by business, private residence, street right-of-way or drainage basin.
2. **Address/Location:** Identify the location by address if available or by nearest street intersection.
3. **Date, Time, and Temperature:** Record the date and time and estimated temperature when performing the inspection.
4. **Inspected by, and Watershed:** Fill in the name of the employee conducting the inspection. Use the Storm Sewer System Maps to identify the watershed.

Visual Observations

1. **Is there water flowing?** Check the “No” box if there is no water flowing. Check the “Yes” box only if water is flowing. If you checked the “Yes” box, you also need to answer the questions about the quality of the water. Check the appropriate boxes for the water quality questions.
2. **Is there standing water?** If you see standing water check the “Yes” box and answer the questions pertaining to water quality. Check the “No” box if no standing water is present.

Water Quality

1. **Is there a smell associated with the water? (Odor)** As you are near the water, do you smell rotten eggs or sanitary wastewater? If so, mark “Yes” and describe the smell if possible.
2. **What does the water look like? (Color and Turbidity)** Imagine a glass of drinking water, you can see through the water and the water is not colored. Is this what the water looks like? **Colored:** Imagine a glass of tea, you can see through the water, but the water is colored. Is this what the water looks like? Be careful not to let the color of subsurface objects fool you. For example, green algae under the water can give water the appearance of being green. Color can range from light to dark. If the water seems very lightly colored but you are in doubt, do not mark the “Yes” box.
Muddy: You cannot see through the water (it has a cloudy or muddy appearance).
If yes, are petroleum products present in water? Imagine pouring new or used motor oil into water. Do you see this effect in the water flowing from the end-of-pipe? Unless you see floating globs or a moving sheen of oil in the water mark “No”.
3. **Is there trash or debris or other floatable material present?** The trash and debris could be small items such as pop cans and plastic bags, or oily substance. Look for products from manufacturing such as animal fats, foam, plant parts, sawdust, and oily substance, etc., not the typical pop can or candy wrapper. If you see any floatable material, trash or debris check the “Yes” box.
4. **Is vandalism present? (Vandalism)** Is there spray painted gang markings, expletive language or pictures present? If so check “Yes”.

5. **Are there large amounts of sediment present?** Note the possible source for sediment is construction sites nearby or possibly an unknown source.

Participants

1. **Check the appropriate box for all participants involved with the incident or investigation.** If participants are not listed with a check box add them to the blank boxes or in the comments section.
2. **Check the photo taken box if photos are taken.**

Comments

1. **Add comments appropriate to the investigation; residents statement, action to be taken by the discharger if identified, code compliance notice issued, etc.** Comments can be used for follow-up inspections.

Compliance Action Required/Completed

Compliance actions and completion are documented only when such action is required. Each incident or finding will be evaluated by city staff for the appropriate action to be taken.

FIELD EQUIPMENT CHECKLIST

Make sure you have the appropriate protective equipment before starting the investigation.

- Safety and communication equipment (i.e. safety vest, cell phone, business card)
- Clipboard
- Digital Camera
- Visual Inspection Forms
- Pen and/or Pencil
- Storm Sewer Locate Sheets
- Staff Phone Directory



**Illicit Discharge Detection and Elimination
Inspection Report**

Site Name: _____ Date: _____

Inspected By: _____ Watershed: _____

Address/Location: _____

Time: _____ am/pm Weather: (rain, snow, cloudy, windy, etc.) _____ Temperature: _____

Visual Observations

Comments

Is water flowing?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Standing water?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
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Water Quality

Comments/Description

Odors?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Color present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Turbidity?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Floatable material?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Deposits or stains?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Vegetation present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Structural damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Signs of vandalism?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Sediment present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Trash or debris present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Oily substance?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Other unusual observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Participants

Code Compliance	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Infrastructure Inspection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Development Inspection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Fire Department	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Street Operations	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Photos taken	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Comments

Compliance Action Completed