ILLICIT DISCHARGE DETECTION AND ELIMINATION

STANDARD OPERATING PROCEDURES AND GUIDANCE

SOUTHERN INDIANA STORMWATER ADVISORY COMMITTEE

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PREFACE

In 2021, the State of Indiana, via the Indiana Department of Environmental Management (IDEM), adopted the Indiana MS4 General Permit (INR040000). This permit requires designated municipal separate storm sewer system (MS4) entities to develop Stormwater Quality Management Plans (SWQMPs) that address the water quality impacts of non-stormwater discharges to the stormwater drainage systems. This permit requires MS4s to prohibit non-stormwater discharges, map their stormwater drainage systems, and develop and implement an illicit discharge detection and elimination (IDDE) program.

Developed in 2004 through the Southern Indiana Stormwater Advisory Committee (SWAC), this document was revised in 2022, and is continuously updated. This serves as an IDDE plan and guidance for implementing the IDDE program in a manner consistent with applicable illicit discharge regulations and the requirements of General Permit INR040000. This plan outlines general policies and procedures that can be used to assist with compliance of the IDDE components of the Stormwater Phase II NPDES permit.

Developed: 2004
Reproduced: May 2022

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Dry Weather Screening – Flow Diagram for Inspections

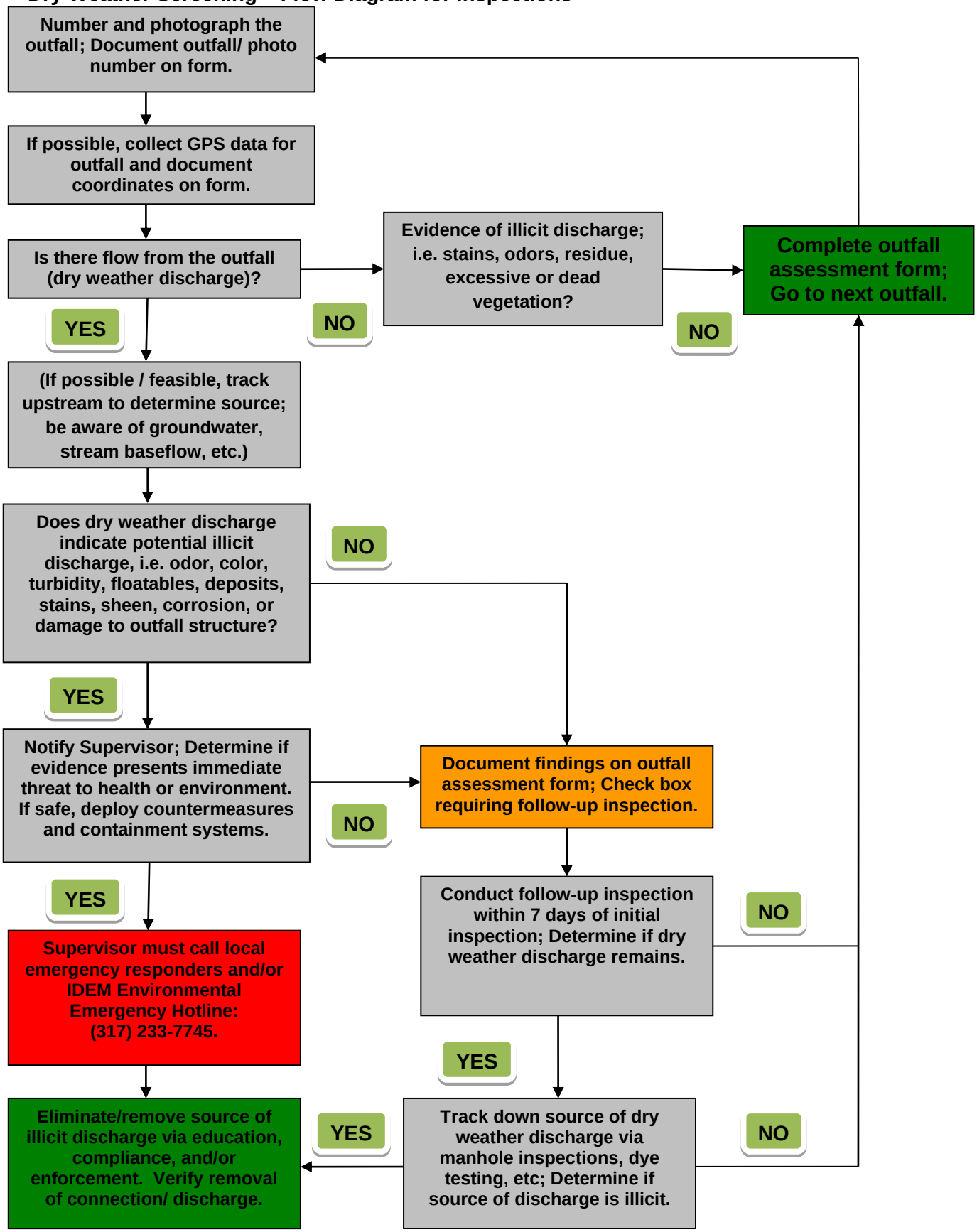

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Table of Revisions

The following table summarizes revisions, additions, deletions, etc. to the Illicit Discharge Detection and Elimination Standard Operating Procedures:

Date	Affected Sections	Summary of Change
5/12/2014	Multiple sections	Updates throughout document for clarity of content. Photos updated, if needed.
7/5/2019	i, iii, ix	Minor updates to document. New cover sheet developed. Table of revisions added.
5/2/2022	Preface, contacts	Updates for new General permit and new contact information.

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SECTION 1: IDDE PROGRAM INTRODUCTION

1.1 Background

On December 8, 1999, the EPA issued regulations that expanded the existing NPDES Storm Water Program to include discharges from small municipal separate storm sewer systems (MS4s) in "urbanized areas" and stormwater discharges from construction activities that disturb more than one acre of land. These regulations are commonly referred to as the "Phase II Storm Water Program".

In 2021, the State of Indiana, via the Indiana Department of Environmental Management (IDEM), adopted the Indiana MS4 General Permit INR040000, which requires designated MS4 entities to develop Storm Water Quality Management Plans (SWQMPs) that address the detrimental water quality impacts of non-stormwater discharges to their stormwater drainage systems.

The permit requires MS4s to prohibit the non-stormwater discharges, map their stormwater drainage systems, and develop and implement an illicit discharge detection and elimination (IDDE) program.

1.2 Defining Illicit Discharges

Illicit discharges are defined by the State of Indiana as "any discharge to an MS4 conveyance that is not composed entirely of storm water, except naturally occurring floatables, such as leaves or tree limbs".

Illicit discharges are most typically categorized as spills, illegal connections, illegal dumping, or prohibited discharges entering the MS4's stormwater drainage system, and often consist of sewage, septic tank effluent, oil disposal, radiator flushing, laundry wastewater, construction site wastes, roadway spills, illegal dumping and improperly disposed of household hazardous wastes.

Illicit discharges can also be categorized by the manner in which they enter the storm sewer system. Direct discharges enter the system via a direct connection or discharge to the storm sewer system. A sanitary sewer cross connection is a common example of a direct illicit discharge. An indirect illicit discharge often enters the storm sewer system via running off into a stormwater inlet or by infiltrating through the joints in a pipe. Examples of indirect discharges to the storm sewer system include groundwater seepage, spills, illegal dumping and car wash runoff that reaches a stormwater inlet.

Illicit discharges are often identified by substantial dry weather discharges from storm sewers that contain a variety of water quality pollutants. However, not all dry weather flows contain pollutants. Some dry weather flows may originate from springs, groundwater flows, or leaking drinking water pipes.

Example of an illicit discharge from a septic system. Stormwater Magazine. October 2003.

Dry weather flows are often unique and can occur on a continuous, intermittent, or transitory basis. Con--tinuous flows are the easiest to identify due to the nature of their

ongoing discharges. Intermittent discharges typically occur during a short period of time and during specific events at facilities that generate discharges based upon operational processes, scheduled maintenance activities, or season/ weather specific operations.

In order to address the variety of types and frequencies or illicit discharges, the MS4 community has additionally defined illicit discharges by identifying specific legal and illegal discharges to its MS4 conveyance system. These discharges are described in detail in MS4 community's IDDE ordinance. In general, the ordinance describes illicit discharges as any discharge that degrades the quality of the community's stormwater receiving streams.

1.3 Impacts of Illicit Discharges on Water Quality

The US EPA, as well as MS4s and researchers, has completed numerous studies documenting the magnitude and variety of pollutants associated with illicit discharges from urban storm sewers (EPA, 1983). Illicit discharges are commonly known to contain elevated concentrations of nutrients, metals, oil and grease, toxic chemicals and bacteria.

In fact, several studies have shown that illicit discharges from storm water conveyance systems are a significant source of water quality impairments in many urban streams and waterways. Illicit discharges pose a public health danger to the community and can be serious threats to drinking water sources and aquatic life.

1.4 Regulatory Authority

Due to the detrimental impact of illicit discharges on water quality and the requirements of INR040000, the community prepared and adopted an illicit discharge ordinance. This ordinance makes illicit discharges illegal and prescribes the penalties and corrective actions necessary for mitigating any illicit discharges that may be identified within the MS4 area.

This document has been prepared to serve as the community's IDDE plan and guidance for implementing their IDDE program in a manner consistent with the community's illicit discharge ordinance and the requirements of INR040000. This plan outlines the policies and procedures that will be used to assist with compliance with the community's Phase II MS4 NPDES permit.

SECTION 2: SELECTING AREAS FOR IDDE ACTIVITIES

2.1 MS4 Priority Areas

During the 1980s, many Phase I stormwater communities used land usage data to predict the potential for illicit discharges within their MS4 areas. The US EPA's National Urban Runoff Project (NURP) study compiled the data associated with these Phase I MS4 efforts and evaluated the pollutants associated with illicit discharges from a variety of urban land uses.

Of the programs conducted under the NURP study, the Washtenaw County, Michigan Illicit Discharge Program, a component of the larger Huron River Pollution Abatement Program, was considered to be one of the largest and most successful programs. Findings from Washtenaw County indicated that all plating facilities and over 80% of retail facilities and were found to have illicit discharges. In addition, over 60% of automobile related service businesses were found to have illicit discharges, while only 6% of residential homes were found to have illicit discharges.

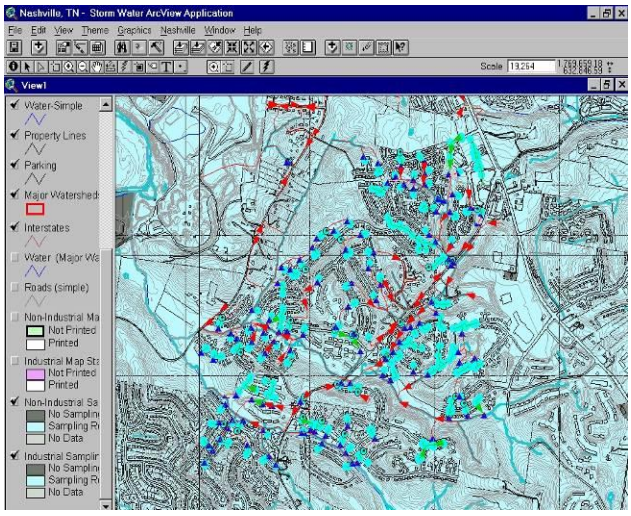
Based upon this approach and the knowledge gained from Phase I MS4s, the community plans to utilize a land use based approach to prioritizing and implementing its illicit discharge detection and elimination activities.

2.2 Desktop Assessments and Screening

As part of the MS4 permit in Indiana, the community completed and submitted an updated Part B: Baseline Characterization Report to the IDEM, which identified land uses and sensitive locations within its MS4 area. The community has developed an updated storm sewer system map, utilizing geographic information system (GIS), with mapping capabilities that include the following datasets, at a minimum:

- land usage
- aerial photography
- topography (2-foot contours or best available)
- stormwater outfalls
- storm sewer infrastructure
- open ditches/ channels
- watersheds/ sewer sheds/ drainage areas
- name and location of MS4 receiving waters
- name and location of waters of the State of Indiana

Data has been collected by compiling information from a variety of sources, including federal and state datasets, which are typically free of charge, to datasets that are purchased from private or semi-public entities, such as aerial photography. Mapping information has been compiled primarily through the aid of a global positioning system (GPS) field unit that is compiled in a geographic information system (GIS) map. As new stormwater features are added to the system, information is collected with the GPS field unit and joined with the base map. Digital submittals of new redevelopment, record drawings, or as-builts, may be required in the future.



Example of GIS application for dry weather screening used in Nashville, Tennessee

When appropriate, the community will perform desktop assessments to prioritize IDDE efforts and program development. The desktop assessment will allow MS4 staff to screen and rank the MS4 area or portions of the MS4 area as having a high, medium or low potential for illicit discharges. Based upon the findings of the NURP and specifically the Washtenaw County, Michigan program, industrial and commercial land uses are anticipated to be ranked higher than residential land uses, while additional data, such as complaints or referrals, may be utilized to fine tune the ranking system based upon local conditions.

Desktop assessments will ultimately guide the development of the IDDE program by providing a mechanism by which the MS4 can set IDDE program priorities. For example, if it is determined that low density residential land usage with a low risk for illicit discharges dominates the MS4 area, then the community may decide that the most cost effective approach to its IDDE program could be focusing IDDE efforts on public education. Conversely, if assessments indicate that land uses with high risks of illicit discharges dominates the MS4 area, then the MS4 could focus its efforts on finding and eliminating illicit discharges.

In addition to evaluating land usage, older developments within the MS4 area will be evaluated as these locations are more likely to have illicit discharges due to being constructed prior to current standards for inspections.

Desktop assessments and screening will provide a reproducible and systematic approach for assessing the community's risk for illicit discharges as the community grows and changes over time. Additionally, the assessments are anticipated to generate field maps necessary for completing dry weather screening, as well as source identification and elimination efforts.

2.3 Complaints and Referrals

The Stormwater Phase II Program requires MS4 communities to develop a database for tracking complaints and calls related to illicit discharges. The database will be geo-referenced so that it may be correlated with other IDDE data and utilized in desktop assessments to help with future IDDE prioritizations.

Although the community does not intend to deviate from its IDDE program and the priorities as outlined in this plan, it may give precedence to complaint driven IDDE efforts based upon the severity, frequency and location of reported and confirmed illicit discharges.

This database will be developed in conjunction with the tracking mechanism necessary for reporting to the IDEM on construction site permitting activities within the MS4. If readily available, historical complaint data will also be entered into the database.

2.4 Water Quality Data

Although limited water quality data is available within the community's MS4 area, in some cases, appropriate water quality data may be available to assist in prioritizing locations for IDDE efforts. Where available and where the data is of sufficient quality, the community may be able to use existing water quality data to assist in priority setting for the IDDE program.

Currently, the community does not plan to collect water quality data to assist with IDDE program development; however, the community may choose to collect physical, chemical, biological, or other data directly associated with water quality in conjunction with its dry weather screening program. Dry weather screening and stormwater outfall assessments are discussed in detail in Section 3.

SECTION 3: DRY WEATHER SCREENING

3.1 Background

The IDEM requires the use of dry weather screening protocols to identify illicit discharges within the MS4. As implied by its name, dry weather screening is a process used to locate illicit discharges after extended periods of dry weather, often 48 to 72 hours after a rainfall of 0.10 inches or more. Dry weather screening is typically performed at storm sewer outfalls, but in some cases, may be performed by examining storm sewer manholes.

Dry weather screening is a systematic process for locating stormwater outfalls and evaluating these outfalls for discharges (flow), odor, color, turbidity and floatables. Although the impact of a dry weather discharge on receiving streams is often very obvious, it may not be easy to determine if a discharge is having a negative impact on the receiving stream based upon visual observations alone. As a consequence, the visual observations are often conducted multiple times (at least twice) to allow for verification of the discharge and a better assessment of the discharge's impact over time.

If the impact of a suspected illicit discharge is still in question after a follow up visit, dry weather screening is often supplemented with chemical, biological or physical analysis to identify any pollutants that may be associated with the discharge. To minimize the costs associated with water quality sampling, communities often monitor water quality parameters considered to be indicators of different categories of illicit discharges. Ammonia, for example, is typically used as a primary indicator of sewage pollution, while fluoride is a common indicator for drinking water that may be leaking into the storm sewer system.

Since dry weather screening and water quality monitoring can be time consuming and expensive, many stormwater programs have integrated their screening programs with infrastructure inventories or broader stream corridor assessments to obtain maximum benefits from staff time spent in the field. Integrated efforts typically include walking stream corridors to assess stream bank/ channel erosion, identify blockages, identify unknown connections/ discharges, marking or numbering outfalls and assessing the overall physical condition of streams and open channel storm water conveyances as part of a scheduled maintenance program.

Example of dry weather screening at a large diameter box culvert

These efforts are easiest to perform during the fall during "leaf off" conditions, but may be performed during any season. Leaf off conditions makes it easier to locate storm sewer outfalls and to navigate rough terrain associated with stream banks and channels. In tough field conditions, field screening crews typically consist of two (2) persons for safety.

Some MS4 communities have involved watershed groups and the public in dry weather screening and stream corridor assessment efforts in order to address the public involvement requirements of their stormwater permit. However, these efforts must be carefully organized and supervised due to the liabilities posed to local governments.

Another consideration for MS4s to consider is identifying local partnerships to help minimize the costs of water quality monitoring and laboratory analysis of water quality samples. Local Health Departments often have access to water quality monitoring equipment and laboratory services via their relationship with the State Board of Health and can be

excellent partners for MS4s. In addition, local drinking water and wastewater treatment plans often have in-house laboratories and staff with the ability to analyze samples for much less cost than contract laboratories. Hach® kits also provide a cost effective solution for sampling many indicator parameters.

3.2 Dry Weather Screening Procedure for Storm Sewer Outfalls

The following dry weather screening procedure should be followed for outfalls of all shapes and sizes, including large and small pipes, submerged or partially submerged outfalls, blocked outfalls and outfalls from stormwater treatment facilities. Field screening staff should only skip downspout drains, open ended culverts (where you can see through the culvert), weep holes and drop inlets from roads or bridges.

Example field inspection forms are included in the appendices and should be completed for each outfall, as follows:

1. Utilizing desktop assessment or copies of USGS topographic maps, locate the storm sewer outfall.
2. Number and photograph the outfall, and document the photo number on the assessment form.
3. If available, collect GPS data for the outfall and record coordinates.
4. Measure the outfall structure to characterize its shape, size, and material(s) and record outfall characterization data.
5. If a dry weather flow is occurring at the outfall, record additional observations including flow, temperature, odor, color, turbidity, solids and floatables (toilet paper, oil sheen, etc).
6. If a dry weather discharge is obviously illicit, field crews must report the illicit discharge to their supervisor immediately for source identification efforts and appropriate compliance/ enforcement actions. Source identification is discussed in detail in Section 4.
7. The supervisor or his designated staff must conduct follow up inspections to confirm or rule out the presence of a suspected illicit discharge. This process may include any of the options discussed in Section 4 of this document.

Example of numbering and photographing a stormwater outfall

While in the field, forms from each dry weather screening survey should be kept together in a three ring binder or clip board. Field sheets should be maintained for several years as supporting documentation for an electronic database. All field sheets should be checked by a supervisor for quality assurance/ quality control (QA/QC). Any errors or omissions must be corrected on the forms and forms must be approved by the supervisor prior to data entry.

When field sheets have been approved, all data from the outfall assessment forms must be entered into the appropriate electronic database. This database is critical to annual reporting to the IDEM and must be complete and accurate. Data entered into the database should also have a QA/QC review.

Example of field crew collecting GPS data and conducting dry weather screening protocols. Stormwater Magazine. January 2004.

3.3 Interpreting Dry Weather Screening Data

The key to understanding dry weather screening results and data is the ability to diagnose illicit discharges based upon the characteristics of the discharge. For the purposes of this program, observations of temperature, odor, color, turbidity, solids and floatables will be used as the primary indicators of illicit discharges. The following discussion provides an explanation of how results for each of these parameters may be used to diagnose illicit discharges.

Temperature observations can often be used to identify illicit connections from sanitary sewer systems or septic systems. Discharges of sewage are typically much warmer than the temperature of most receiving streams.

Most strong odors are associated with illicit discharges and can be traced to specific types of operations. Typical observations of odors during illicit discharge inspections include gasoline, oil, sewage, chemicals or decomposition. Further descriptions of these types of odors are as follows:

- Sewage – smell associated with stale sanitary wastewater, which can be present in outfall or in receiving streams. Likely source includes sanitary sewer cross-connection or improperly installed sewer lateral. May also be associated with a straight pipe discharge from a septic tank or a failing septic system immediately adjacent to a receiving stream.

- Rotten Eggs (sulfide) – smell associated with stale sanitary wastewater, but can also be indicative of meat processing facilities, canneries, or dairies. In the absence of any of these facilities, sanitary sewer cross-connections or straight pipe discharges from septic systems should be suspected.

- Oil or Gas – smell is a common indication of nearby gas stations or vehicle maintenance operations. However, in residential areas, this smell may be due to improper disposal of household hazardous wastes via storm drains or small engine or vehicle maintenance operations located at an individual residence. Industrial areas can have many potential sources of oil or gas, including refineries or manufacturing operations.

- Rancid/ Sour – the smell of rancid or sour discharges are most likely associated with food processing facilities or dairies.

Example of floatables from an illicit discharge to a storm sewer.

Notable discoloration from stormwater discharges is typically an important indicator of illicit connections or illegal dumping. A variety of colors may be found. Yellow colorations may result from discharges from

chemical, textile, or tanning plants. Brown colors typically come from meat packing facilities, printing facilities, or metal, stone or concrete operations. Green chemicals can come from chemical plants or textile operations, but may also be associated with antifreeze from residential or commercial vehicle maintenance operations. Red colorations may originate from meat packing or processing facilities, while gray colorations would likely result from dairies or food processing facilities.

Turbidity or "cloudiness" is often a good indicator of illicit discharges. High turbidity is often a characteristic of undiluted dry weather industrial discharges; however, diagnosing this indicator requires the ability to distinguish between cloudy and opaque discharges. Cloudy discharges are most often the result of sewage, concrete or stone operations, fertilizer use or manufacturing, or car dealers and detailing operations. Opaque discharges are most often associated with food processing, timber/ lumber operations, metal works, or painting or paint/ pigment manufacturing.

Floatable matter is one of the most telling indicators of the origin of an illicit discharge. Floatables can include solids from industrial or sanitary wastewater, such as toilet paper. Floatables may also include industrial pollutants, such as animal fats, food, solvents, fuels, sawdust, foam or packing materials. Oil sheen is a common indication of nearby gas stations or vehicle maintenance operations. However, in residential areas, oil sheen may be due to improper disposal of household hazardous wastes via storm drains or small engine or vehicle maintenance operations located at an individual residence. Industrial areas can have many potential sources of oil sheen, including refineries or manufacturing operations.

Deposits or stains may be indicative of illicit discharges. Sediment is the most common deposit left in stormwater drainage systems. However, deposits and stains may also include crystalline powders from chemical or fertilizer manufacturing, or dark or oily deposits from industrial or vehicle service operations.

Example of visible oil sheen from an illicit discharge. City of Los Angeles.

Vegetation surrounding an outfall may be indicative of excessive sediment and nutrient discharges from construction site or agricultural operations, while a lack of vegetation may indicate the presence of chemicals that are toxic to plant life. It is important not to confuse scouring from high stormwater flows with the affects of toxic discharges.

Damage to outfall structures may also be indicative of an illicit discharge. Cracking and spalling concrete or peeling paint at an outfall are usually caused by severely contaminated discharges. These discharges may be highly acidic or basic and likely originate from industrial facilities. Outfall deterioration should not be confused with poor construction, hydraulic scour or old age.

Example of sediment laden illicit discharge from an active construction site. NRCS.

9SECTION 4: TRACKING DOWN THE SOURCE OF AN ILLICIT DISCHARGE

4.1 Background

Once a dry weather discharge has been discovered, the source of the discharge must be identified. Several methods are available for use in locating the source of a discharge, including manhole investigations, video inspections, smoke testing, dye testing, infrared or thermal photography, or other related methods. Since removal of illicit discharges is a mandatory component of the Phase II Stormwater Program, source identification is a fundamental component of an illicit discharge program.

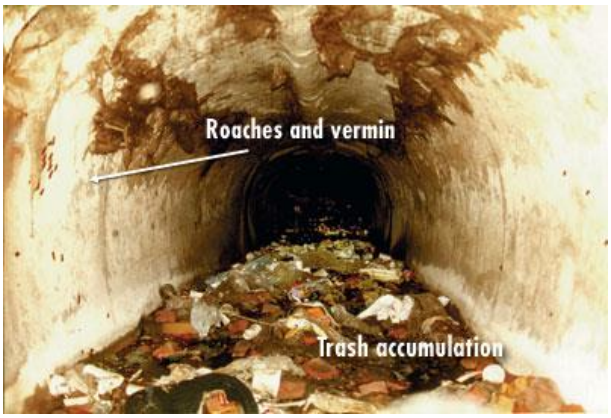
4.2 Manhole Inspections of the Stormwater Drainage System

The most common method of tracking a dry weather flow is to follow the discharge upstream within the storm water conveyance system via manhole inspections. This can be accomplished by following the discharge to the next "upstream" manhole and working progressively up the storm sewer system until the source of the discharge is isolated or by splitting the contributing storm sewer system into equal segments and inspecting manholes at strategic locations within the contributing storm sewer network.

The decision to move upstream or to split manhole inspections among the contributing drainage area depends most typically upon the size of the outfall and the complexity of the stormwater drainage system. As a general rule, dry weather discharges from outfalls greater than 36 inches in diameter with complex drainage are likely candidates for splitting up manhole inspections.

4.3 Video Inspections

Many communities are already familiar with the use of video inspections in sanitary sewer systems; however, this method may also be utilized very effectively for the inspection of storm water drainage systems.



Results from a video inspection of a storm sewer showing trash accumulation from illegal dumping. City of Los Angeles.

Video inspections work by remotely guiding a mobile video camera through storm sewer lines to observe actual connections to the system and to identify the source of dry weather discharges and potentially illicit connections. This method of inspection is often time consuming and can be expensive; however, video inspections can provide access to small diameter pipes where physical inspections are not possible and video inspections provide a less intrusive method of conducting inspections when access is limited, especially in residential areas.

4.4 Smoke Testing

Smoke testing methodologies work by introducing a non-toxic smoke into the stormwater drainage system and then observing where the smoke emerges. Smoke testing can identify illicit connections to the storm sewer system, as well as damaged storm lines where infiltration or inflow is occurring. As a result, it is necessary to

inform area residents of the date and time of smoke testing operations, as well as local police and fire departments. Smoke may cause minor irritation of respiratory passages, so residents with respiratory conditions should receive special attention to determine if they should be present during testing.

Example of smoke testing equipment injecting non-toxic smoke into a storm sewer.

Smoke testing is best utilized in the upper reaches of the stormwater drainage system with small pipes or laterals. In utilizing this method, smoke bombs or candles are most typically used to generate the smoke while blowers are used to force air through the storm sewer. First, storm drain inlets and excluded drainage pipes are sealed off with sand bags or expandable plugs (beach balls are also used in many communities). Next, smoke is released and forced into the storm sewer system by the blower. Lastly, field crews visually inspect the area to identify any smoke escaping the drainage system above ground.

4.5 Dye Testing

This method of source identification involves the dumping or flushing of non-toxic dye into the sinks, floor drains, or toilets and then conducting manhole inspections of both sanitary and storm sewer manholes or outfalls to detect the presence of the dye. As with smoke testing, an informed public is necessary for avoiding unwarranted concerns regarding potential dye "sightings" in local streams, creeks or ditches. Local police and fire departments, as well as wastewater treatment plant or sanitary district operators, should also be informed prior to dye testing.

A field crew of two or more people is typically required to conduct dye testing with one person inside the building and one person stationed at the appropriate manhole or outfall. The person inside the structure injects the dye, adds a sufficient quantity of water to flush the dye through the system, and notifies the person outside to watch for the dye.

This test is relatively quick, typically lasting 30 minutes or less, effective (very definitive), and cheap. Dye testing is best applied when a suspected source of an illicit discharge is narrowed down to a few homes or buildings.

Example of dye testing the stormwater drainage system. Note use of garden hose to flush dye through the system.

4.6 Infrared and Thermal Photography

Infrared and/or thermal photography has been used in several communities to identify the sources of illicit discharges from outfalls and failing septic systems. These methods of heat sensitive photography provide indications of elevated temperatures or differing vegetation

at or under land surfaces or from outfalls which may be indicative of an illicit discharge. For example, if a discharge has a higher temperature that that of the stream or creek to which it discharges, it may well be due to the influence of sewage pollution. In addition, if a land area near a septic system exhibits increased or differing vegetation or an increase in temperature, this may be indicative of a failing septic system.

Example of illicit discharge identified via infrared aerial photography. Stormwater Magazine. March 2004.

4.7 Additional Source Identification Methods

A variety of methods and systems for identifying the source of dry weather discharges have been developed across the country in response the stormwater program mandates. In addition to the methods previously discussed, a few of these methodologies are worthy of note, including the use of sandbags, optical brightener monitoring, and chlorine testing.

The use of sandbags in tracking dry weather discharges involves the placement of sand bags at key locations in the stormwater drainage system to form a temporary obstruction that will retain water from intermittent discharges. Sandbags are typically installed at pipe intersections or upstream and downstream of a connection. If no discharges collect behind the sandbag, then the upstream portion of the drainage system can be ruled out as a source of a dry weather discharge/illicit discharge.

Optical brightener monitoring (OBM) is conducted by securing absorbent pads at locations where dry weather discharges have been detected. The pads are collected after 48 to 72 hours and observed under a fluorescent light to determine if detergents are present from homes, failing septic systems, laundromats, and etc.

Chlorine residual testing is often conducted to rule out discharges of drinking water in locations with public water supply systems. Public water supplies are often utilized for car washing, watering lawns, and other household practices that may be easily diagnosed by the presence of chlorine. In addition, leaking water distribution systems may be detected during this process.

4.8 Illegal Dumping

Developing a system for reporting illegal dumping can be very important for finding sources of illicit discharges. Illegal dumping can be discouraged by creating a hotline that can be used to report illegal dumping and tracking down potential users of the materials that have been dumped. In addition, public education regarding the potential fines associated with illegal dumping may provide a deterrent to these activities.

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SECTION 5: INDUSTRIAL FACILITIES INVENTORY

5.1 Background

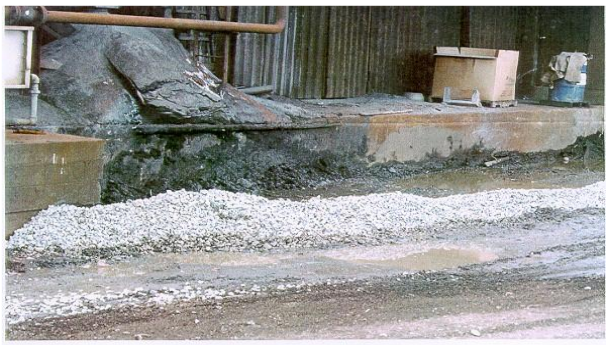
Indiana's MS4 General Permit (INR040000) requires MS4s to identify all active industrial facilities within the MS4 area that discharge into a MS4 conveyance. This mandate was also required of Phase I MS4s. The purpose of this requirement is to encourage MS4 operators to understand which industrial facilities within their jurisdiction are discharging to the MS4's stormwater drainage system. Knowledge about industrial facility locations and operations is important because these facilities have a greater potential to have illicit discharges due to their use of storage of potentially significant pollutants. In addition, this understanding is anticipated to help MS4 operators determine if additional oversight of industrial facilities may be necessary for meeting the goals of the community's stormwater program.

Regulations governing industrial stormwater permitting are driven by Standard Industrial Classification (SIC) Codes, which has been proven by many Phase I Stormwater Programs to be an overly generalized method for determining an industry's potential to pollute a community's stormwater drainage system. Although not mandated by INR040000, it may be in a MS4 operator's best interest to assess the impacts of local industries on the stormwater system, because Phase II NPDES permits make each community ultimately responsible for discharges to their MS4.

5.2 Completing an Industrial Facility Inventory

There are many ways in which communities can identify the industries within their jurisdiction that discharge stormwater to the MS4. In some cases, the MS4 may be small enough that this knowledge is readily known; however, in larger communities this information may need to be compiled from business licenses, industrial pretreatment programs, the IDEM Rule 6 (Industrial Stormwater Permits) database, or from local business directories. In addition, the IDEM's INR040000 Guidance suggests the use of the Harris Infosource (www.harrisinfo.com) as a means of collecting information regarding Indiana businesses.

In addition, MS4s should evaluate local industries that are subject to Industrial Wastewater Pretreatment (IWP) rules. A local business that meets the pretreatment program criteria of Significant Industrial User will have processes and chemicals on site that have the potential for significant impact to storm water. Your POTW should have these industries identified.



Poor waste management at an industrial site with the potential to impact stormwater runoff.

Once a list of local industries has been identified, determining which industrial facilities actually discharge into the MS4 may be a more challenging task. This determination may require a review of as-built plans or it may require site visits in order to adequately determine the drainage patterns for large industrial facilities. Facility inspections are considered by many Phase I Stormwater Programs to be the most definitive method of assessing a facility's potential impact on the stormwater drainage system.

At a minimum, INR040000 requires that MS4s compile information on all active industries within the MS4, including facility name, address, telephone number and SIC Code. In addition to this information, MS4s may want to

complete an inventory of stormwater BMPs being implemented at each industry, the adequacy of these BMPs, and an overall assessment of the industry's potential to contribute pollutants to the stormwater drainage system.

For Rule 6 facilities, it may also be important to contact the IDEM to determine the permit status and compliance history of permitted industries.

5.3 Determining the Extent of the MS4's Oversight of Industrial Facilities

After evaluating the information collected regarding your local industries it will be necessary to determine what, if any, controls should be placed upon these industries by the MS4. At a minimum, INR040000 requires a process to be developed to inform local industries of the MS4's Stormwater Program, illicit discharge prohibitions, and the provision of educational materials.

MS4s may determine that education is their preferred BMP for addressing the impacts of stormwater runoff from industrial facilities. Conversely, MS4s may determine that annual facility inspections are necessary for determining if local facilities are minimizing their potential to contribute pollutants to the stormwater drainage system. Industrial facility inspections should be prioritized based upon the anticipated potential to pollute and/or proximity to outfalls or receiving streams that are experiencing water quality problems.

5.4 Determining Responsibility for Program Implementation

When the extent of the MS4's Industrial Stormwater Program has been determined, appropriate staff should be identified to implement the program. If many industries exist within your MS4 with a significant potential to impact the stormwater drainage system, then a dedicated staff person may be necessary for appropriate implementation of the program. However, if your community has few industries or industries with limited potential for polluting, you may be able to accommodate implementation of the program with existing staff.

MS4s should first consider the use of existing staff and programs that have frequent contact with local industries, such as industrial wastewater pretreatment (IWP) programs. IWP programs are already required to audit significant industrial users within the community and may be an efficient mechanism for implementing this program. Many local fire departments also conduct fire insurance inspections of local businesses and industries and can be cross-trained to conduct facility inventories for the stormwater program as well.

SECTION 6: ELIMINATING ILLICIT DISCHARGES

6.1 Background

Once the source of an illicit discharge has been identified, communities have a variety of means at their disposal for removing or eliminating illicit discharges from their stormwater drainage systems. Methods for removing illicit discharges include compliance assistance, enforcement actions, incentives, or spill response. No matter what method is chosen to fix an illicit discharge, the action must clearly identify the following:

- Who is responsible,
- What method will be used,
- How long the repair will take, and
- How the solution will be confirmed.

6.2 Compliance and Enforcement Actions

In most situations, communities will respond to the discovery of an illicit discharge in a graduated manner with initial attempts to gain voluntary compliance followed by escalating and increasingly severe enforcement actions. However, deliberate actions by individuals knowledgeable about the consequences and requirements of local illicit discharge prohibition will likely require swift implementation of the most severe penalties available to the MS4 operator.

In many cases the party responsible for the illicit discharge may not be aware of the existence or the environmental consequence of an illegal connection/discharge. In such cases, voluntary compliance is commonly achieved by providing the responsible party with information about the illicit connection, the environmental consequences of the connections, applicable regulations, and by requesting that the problem be fixed.

Typically, property owners are responsible for the costs of removing an illicit connection and reconnecting it to sanitary sewers. However, these costs can sometimes be a financial burden. In recognition of this fact, some communities may choose to provide assistance with these costs or services.

Where voluntary compliance has not been achieved, your community's illicit discharge ordinance provides MS4 operators with the authority to issue Notice of Violation (NOV) letters requiring violators to a remove illicit connection or eliminate an improper discharge. MS4 operators also have the authority to issue stop work orders, seek injunctive solutions to the problem, or to abate the problem at the cost of the property owner if an immediate threat to public health or the environment exists.

6.3 Integrating Illicit Discharge Requirements and Construction Site Management Goals

Most stormwater program managers quickly realize the interconnectedness between illicit discharge and the stormwater pollution prevention requirements in the erosion protection and sediment control ordinances. When inadequate erosion and sediment controls are not implemented on construction sites, sediment and a variety of other pollutants are washed off construction sites by stormwater runoff.

Strict implementation of your community's erosion protection and sediment control ordinance is fundamental to the successful implementation of your illicit discharge program.

6.4 Spills and Illegal Dumping

Spills and illegal dumping are also sources of illicit discharges that must be addressed by illicit discharge programs. Spills and illegal dumping are especially important across

Southern Indiana due to the presence of karst features (caves and sinkholes).

Most communities have access to and participate in local emergency management activities, such as LEPC, EMA, or HAZ-MAT response teams. These organizations are primary first responders to spills and they should be informed and educated about your Stormwater Program, especially the stormwater drainage system mapping available or under development for your MS4. Most commonly, local fire and police departments are the first responders on the scene of a spill or accident, so staff training or cross-training can be critical to effective implementation of illicit discharge programs for your community.

In addition, the State of Indiana has established spill reporting, containment and response requirements in INR040000. This rule establishes statewide criteria for reporting spills from facilities or emergencies and has established an environmental hotline for reporting such spills (1-888-233-7745).

SECTION 7: EDUCATION AND OUTREACH FOR ILLICIT DISCHARGES

Indiana's INR040000 requires that MS4 operators educate public employees, businesses, and the general public about the hazards associated with illicit discharges and improper waste disposal. To this end, the following strategies for education and outreach related to illicit discharges have been incorporated into the SWQMP.

7.1 Municipal Employee Education

While it should be obvious that public works employees should receive training regarding the IDDE program, it may also be beneficial for other employees to be targeted for education and training. A brochure will be developed to educate MS4 employees about the IDDE program and distributed to public works staff. In addition, this brochure will be distributed to Fire and Police Departments, who are first responders to most accidents and spills, and to any other appropriate departments with field staff that may have the opportunity to find suspected illicit discharges. This may also include the Buildings and Grounds, Parks, Health, and Emergency Management Departments, as appropriate.

7.2 Public Education

The public will be educated about the impacts of illicit discharges via the development and distribution of brochures or community guides to pollution prevention. These publications will be mailed or distributed at appropriate MS4 offices, at public meetings, or at community or neighborhood meetings related to stormwater or drainage matters.

In addition, web site content will be developed to provide additional information of the stormwater program, especially the IDDE program. The website will include information indicating how the public may contact the MS4 to report illicit discharges or spills.

Example of educational workshops for public employees in Franklin, Tennessee.

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SECTION 8: IDDE REFERENCES

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Appendix A

Illicit Discharge Detection and Elimination: Dry-Weather Screening Program for Outfalls
Initial Outfall Visit Form

INITIAL STRUCTURE AND WATERSHED INFORMATION

Outfall ID: _____ HUC14 #: _____ HUC14 Name: _____

Outfall Type: Culvert Box Culvert Bridge Concrete-Lined Channel Manmade Channel Other: _____

Outfall Material: Concrete Corrugated Metal Pipe (CMP) HDPE/Plastic Other: _____

Structure Span: _____ Structure Rise: _____ Effective Opening (ft^2): _____

Discharging To: Stream/Creek Private Drain Another MS4 Sinkhole/Class V Injection Well Other: _____

Watershed Size: < 1 Acre 1 to 5 Acres 6 to 25 Acres 26 to 100 Acres > 100 Acres Unknown

Watershed Landuse: Industrial Commercial Residential Agricultural Wooded Primary Landuse: _____

GIS INFORMATION: Feature ID: _____ Outfall Elevation (if available): _____

GPS Coordinates Collected: Yes / No Latitude: _____ Longitude: _____

FIELD SCREENING

Field Crew: _____ Date: _____ Time: _____ Outfall ID: _____

Type of Visit: Routine Complaint-Driven Follow-Up Other: _____ Date of Last Visit: _____

# of Pictures Taken: _____ Picture Description(s): _____

Last Rain (circle one): > 7 days > 72 hrs < 72 hrs < 3 hrs Last Precipitation (circle one): > 0.1" < 0.1"

Air Temp: _____ Weather Conditions (circle one): Sunny Partly Cloudy Partly Sunny Overcast Rain

Flow Present: Yes / No Water Temp: _____ Flow Estimate: Trace Moderate Significant Full Pipe/ Channel

DISCHARGE OBSERVATIONS (circle all that apply)

Odor:	None	Musty	Sewage	Rotten Egg	Gas/Oil	Other: _____
Color:	Clear	Yellow	Brown	Green	Grey	Other: _____
Turbidity:	Clear	Slight	Moderate	High	Opaque	Other: _____
Floatables:	None	Trash	Oily Sheen	Suds / Foam	Yard Waste	Other: _____
Vegetation:	Normal	Bare	Excessive	Surface Algae	Bottom Algae	Other: _____

IF NO DISCHARGE, EVIDENCE OF ILLICIT DISCHARGE (circle all that apply)

Deposits/ Stains:	None	Mineral	Sediment	Oils / Grease	Sewage	Other: _____
Odor in Pipe:	None	Musty	Sewage	Rotten Egg	Gas/Oil	Other: _____
Vegetation:	None	Normal	Excessive	Killed Veg		Other: _____

OTHER INSPECTION INFORMATION (circle all that apply)

Structure:	Normal	Cracking	Corrosion	Settlement	Struct. Failure	Other: _____
Outfall Scouring:	None	Minor	Moderate	Significant	Struct. Failure	Other: _____

Suspected Illicit Discharge: Yes / No Upstream Investigation Performed: Yes / No (if "Yes" describe in Comments)

Water Sampling Needed: Yes / No Samples Collected: Yes / No Follow-up Visit Required: Yes / No

FOLLOW-UP VISIT OBSERVATIONS & SOURCE IDENTIFICATION AND REMOVAL

Field Crew: _____ Date: _____ Time: _____

Last Rain (circle one): > 7 days > 72 hrs < 72 hrs < 3 hrs Last Precipitation (circle one): > 0.1" < 0.1"

Air Temp: _____ Weather Conditions (circle one): Sunny Partly Cloudy Partly Sunny Overcast Rain

Discharge Present: Yes / No (If "Yes" follow system upstream to identify origin)

Source Identified: Groundwater/Stream Baseflow Lawn Watering Residential Car Washing Crawl Space/Footing Drain

If Other, Describe: _____

Need for Countermeasures, Compliance, or Enforcement Action(s): _____

Comments: _____

_____

_____

_____

Appendix B

Illicit Discharge Detection and Elimination: Dry-Weather Screening Program for Outfalls
Subsequent Outfall Visit Form

FIELD SCREENING

Field Crew: _____ Date: _____ Time: _____ Outfall ID: _____

Type of Visit: Routine Complaint-Driven Follow-Up Other: _____ Date of Last Visit: _____

# of Pictures Taken: _____ Picture Description(s): _____

Last Rain (circle one): > 7 days > 72 hrs < 72 hrs < 3 hrs Last Precipitation (circle one): > 0.1" < 0.1"

Air Temp: _____ Weather Conditions (circle one): Sunny Partly Cloudy Partly Sunny Overcast Rain

Flow Present: Yes / No Water Temp: _____ Flow Estimate: Trace Moderate Significant Full Pipe/ Channel

DISCHARGE OBSERVATIONS (circle all that apply)

Odor:	None	Musty	Sewage	Rotten Egg	Gas/Oil	Other: _____
Color:	Clear	Yellow	Brown	Green	Grey	Other: _____
Turbidity:	Clear	Slight	Moderate	High	Opaque	Other: _____
Floatables:	None	Trash	Oily Sheen	Suds / Foam	Yard Waste	Other: _____
Vegetation:	Normal	Bare	Excessive	Surface Algae	Bottom Algae	Other: _____

IF NO DISCHARGE, EVIDENCE OF ILLICIT DISCHARGE (circle all that apply)

Deposits/ Stains:	None	Mineral	Sediment	Oils / Grease	Sewage	Other: _____
Odor in Pipe:	None	Musty	Sewage	Rotten Egg	Gas/Oil	Other: _____
Vegetation:	None	Normal	Excessive	Killed Veg		Other: _____

OTHER INSPECTION INFORMATION (circle all that apply)

Structure:	Normal	Cracking	Corrosion	Settlement	Struct. Failure	Other: _____
Outfall Scouring:	None	Minor	Moderate	Significant	Struct. Failure	Other: _____

Suspected Illicit Discharge: Yes / No Upstream Investigation Performed: Yes / No (if "Yes" describe in Comments)

Water Sampling Needed: Yes / No Samples Collected: Yes / No Follow-up Visit Required: Yes / No

FOLLOW-UP VISIT OBSERVATIONS & SOURCE IDENTIFICATION AND REMOVAL

Field Crew: _____ Date: _____ Time: _____

Last Rain (circle one): > 7 days > 72 hrs < 72 hrs < 3 hrs Last Precipitation (circle one): > 0.1" < 0.1"

Air Temp: _____ Weather Conditions (circle one): Sunny Partly Cloudy Partly Sunny Overcast Rain

Discharge Present: Yes / No (If "Yes" follow system upstream to identify origin)

Source Identified: Groundwater/Stream Baseflow Lawn Watering Residential Car Washing Crawl Space/Footing Drain

If Other, Describe: _____

Need for Countermeasures, Compliance, or Enforcement Action(s): _____

Comments: _____

_____

_____

_____