City of Walker

NPDES Municipal Separate Storm Sewer System (MS4) Illicit Discharge Elimination Plan

Prepared for:
The Lower Grand River Watershed

August 1, 2013
Project No. G120878

Fishbeck, Thompson, Carr & Huber
engineers • scientists • architects • constructors

LOWER GRAND MS4 COMMUNITIES IN KENT COUNTY

ILLICIT DISCHARGE ELIMINATION PLAN

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS/ACRONYMS

BMP	Best Management Practice
GVMC	Grand Valley Metropolitan Council
IDEP	Illicit Discharge Elimination Plan
KCDC	Kent County Drain Commissioner
KCRC	Kent County Road Commission
LGRW	Lower Grand River Watershed
MDEQ	Michigan Department of Environmental Quality
MS4	Municipal Separate Storm Sewer Systems
OSDS	Onsite Sewage Disposal Systems
PEAS	Pollution Emergency Alert System
PEP	Public Education Plan
SSOs	Sanitary Sewer Overflows
SWPPI	Stormwater Pollution Prevention Initiative

1.0 INTRODUCTION

This Illicit Discharge Elimination Plan (IDEP) has been prepared in accordance with the requirements of the General Permit Application for Storm Water Discharges from Municipal Separate Storm Sewer Systems (MS4) subject to watershed plan requirements. The IDEP is intended to prohibit and effectively eliminate illicit discharges to the MS4.

The IDEP is being implemented under a cooperative program administered by the Grand Valley Metropolitan Council (GVMC) and involving the county agencies and municipal units participating in the Watershed Approach.

The IDEP includes the following section headings:

- IDEP goals
- Legal authority
- Outfall and discharge point lists
- Identification and elimination of existing illicit discharges
    - Locating problem areas
    - Finding the source of illicit discharges
    - Removing/correcting illicit connections
- Minimizing seepage from septic systems and sanitary sewers
- Spill response procedures
- Preventive measures
- Documentation and reporting

2.0 IDEP GOALS

- Find, prioritize, and eliminate illicit discharges and illicit connections identified during dry-weather screening activities.
- Minimize infiltration of seepage from sanitary sewers and onsite sewage disposal systems (OSDS) into the MS4.
- Establish the legal authority for the community to eliminate illicit discharges found entering the MS4.
- Maintain a map of the MS4, point sources, and stormwater outfalls.
- Establish a system to document and report information regarding the IDEP including complaints, outfall screening, and illicit connections found and removed.
- Determine a method to evaluate the effectiveness of the illicit discharge elimination activities based on the watershed goals.

3.0 LEGAL AUTHORITY - IDEP ORDINANCES

Local ordinances, the Michigan Plumbing Code of 2000, the Michigan Drain Code of 1956, Michigan Act 451, and the Federal Clean Water Act provide the basic legal tools to implement the IDEP. Local ordinances effectively prohibit illicit connections and discharges; allow surveillance, monitoring, and inspections when needed; and provide enforcement authority and penalties.

An ordinance (or other regulatory mechanism where an ordinance is not feasible or appropriate) to effectively prohibit illicit discharges into the MS4 has been adopted by the following participating communities in the Lower Grand River Watershed (LGRW).

Participating Communities with an IDEP Ordinance

Community	Illicit Discharge and Connection Ordinance Adoption Date
Allendale Charter Township	May 10, 2004
Cascade Charter Township	June 23, 2004
East Grand Rapids, City of	September 19, 2005
Ferrysburg, City of	September 7, 2004
Georgetown Charter Township	August 12, 2002
Grand Haven, City of	February 5, 2007
Grand Rapids Charter Township	January 6, 2004
Grand Rapids, City of	July 2001
Grandville, City of	September 26, 2005
Hudsonville, City of	December 14, 2004
Kentwood, City of	October 24, 2004
Kent County Administration and Drain Commissioner	Regulatory mechanism in place
Kent County Road Commission	Regulatory mechanism in place
Plainfield Charter Township	November 6, 2000
Rockford, City of	August 8, 2005
Sparta, Village of	September 13, 2004
Spring Lake, Village of	January 16, 2006
Walker, City of	March 28, 2003
Wyoming, City of	October 3, 2005

Each ordinance or other regulatory mechanism:

- Regulates the contribution of pollutants to the MS4, owned by the permittee.
- Prohibits illicit discharges, including the direct dumping or disposal of materials, into the MS4, owned by the permittee.
- Establishes the authority to investigate, inspect, and monitor suspected illicit discharges into the MS4, owned by the permittee.
- Requires elimination of illicit discharges and connections into the MS4, owned by the permittee.

The Kent County Road Commission (KCRC) and the Kent County Drain Commissioner (KCDC) do not have ordinance authority; however, both agencies have regulatory mechanisms to address illicit discharges.

The KCDC has broad authority to control water pollution in county drains provided by the state Drain Code of 1956. The following are pertinent excerpts.

> The Michigan Drain Code states:
> *Sec. 423. (1) A person shall not continue to discharge or permit to be discharged into any county drain or intercounty drain of the state any sewage or waste matter capable of producing in the drain detrimental deposits, objectionable odor nuisance, injury to drainage conduits or structures, or capable of producing such pollution of the waters of the state receiving the flow from the drains as to injure livestock, destroy fish life, or be injurious to public health.*
>
> *(10) Failure to comply with any of the provisions of this section subjects the offender to the penalties described in section 602.*
>
> *Sec. 602. If any person shall willfully or maliciously remove any section or grade stake set along the line of any drain, or obstruct or injure any drain, he shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding $100.00 and the costs of prosecution, or in default of the payment thereof, by imprisonment in the county jail not exceeding 90 days.*

The KCRC has limited authority under state law to control water pollution in statutory road right-of-ways. When evidence of an illicit discharge to a KCRC ditch or drain is found, and voluntary correction is not forthcoming, the KCRC will contact the appropriate agency, depending on the nature of the illicit discharge, and work with the KCDC, Kent County Health Department, local unit of government, local policing authority and/or the Michigan Department of Environmental Quality (MDEQ) to require elimination. The MDEQ has broad authority to control pollution, either directly or indirectly, to waters of the state provided by Act 451 of 1994.

A summary of indicators typically used to detect certain illicit discharges is included in Appendix 1.

4.0 OUTFALL AND DISCHARGE POINT MAPS AND LISTS

Lists of outfalls and discharge points are kept updated, identifying the location of all outfalls and discharge points the permittee owns and the names of all surface waters of the state that receive stormwater runoff from an MS4. The lists include a discrete identification number, the name of the receiving water, identification as an outfall or discharge point, the latitude and longitude, and the prioritization given to that point for screening purposes. Newly discovered outfalls and discharge points will be identified in the Progress Report. A copy of the current list of outfalls and discharge points is included in Appendix 2.

5.0 TRAINING

Municipal employees, who, as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection, will receive training on recognition and reporting of illicit discharges and connections. This will be accomplished through the IDEP training as identified in Appendix 2D of the Stormwater Pollution Prevention Initiative (SWPPI). Examples of training mechanisms identified in the SWPPI include the review of a Water Pollution Report Form with employees for recording and reporting suspected illicit discharges and an article to be distributed to employees (Appendix 3).

Field personnel will be provided additional training prior to conducting Dry-Weather Screening. Training will include health and safety, documentation and reporting procedures, and visual and olfactory outfall screening procedures. This will be accomplished by hands-on training by a professional engineer or other qualified individual for the field personnel by spring 2013. Alternatively, train-the-trainer sessions will be conducted for each community followed by community training of field personnel, if desired. Additional training will be provided for activities associated with sampling, identifying, and eliminating the source of unauthorized discharges and illicit connections. This will be accomplished, where needed, by hands-on training for the field personnel or by training-the-trainer for each community as appropriate.

6.0 IDENTIFICATION AND ELIMINATION OF EXISTING ILLICIT DISCHARGES

The field work to identify and eliminate illicit discharges and illicit connections will be completed in three steps. The initial step involves *Locating Problem Areas* and will focus on dry-weather screening stormwater outfalls for evidence of illicit discharges. The process is illustrated in Figure 1. The second step will be *Finding the Source* of any illicit discharges and will involve tracing illicit discharges through the stormwater drainage system to the source of the discharge or the illicit connection. This process is illustrated in Figure 2. The final step consists of *Removing/Correcting Illicit Connections*, which will require facilities to disconnect illicit connections and may require enforcement pursuant to existing ordinances and follow-up inspections. Information and test results are recorded on a data sheet, included as Figure 3.

6.1 LOCATING PROBLEM AREAS

Locating the presence of unauthorized discharges will be conducted during the permit cycle using the following techniques:

- Priority areas for detecting non-stormwater discharges will be identified. All permitted outfalls and discharge points will be placed into one of the following priority groups.
    - **High Priority** - Outfalls to waters of the State within the Urbanized Areas that have a history of past illicit discharges, outfalls reported by the public as suspicious, outfalls in areas with a history of illegal dumping, and outfalls serving areas suspected of having illicit discharges.
    - **Medium-High Priority** - Outfalls to waters of the State within the Urbanized Areas that are not in the High Priority group.
    - **Medium Priority** - MS4 to MS4 discharge points within the Urbanized Areas that have a history of past illicit discharges and that serve areas suspected of having illicit discharges due to the land use activities.
    - **Medium-Low Priority** - Outfalls to waters of the State that are within the watershed boundary, but outside of the Urbanized Areas.
    - **Low Priority** - MS4 to MS4 discharge points, within the watershed boundary, that are not in the Medium priority group.

  All High Priority and Medium-High Priority outfalls in Appendix 2 will receive dry-weather screening during the permit cycle. Medium, Medium-Low, and Low Priority outfalls and discharge points will be investigated upon reports of suspected illicit discharges.

- Preferably, dry-weather screening will not commence until at least 48 hours after any rainfall event, but may commence if less than 0.1 inch of rain occurred during the previous 48 hours. Optionally, the field crew will attempt to identify known legitimate dry-weather discharges prior to conducting the field work. Dry-weather screening of all outfalls and MS4-MS4 discharge points will be completed in accordance with the following, and as illustrated as a flowchart in Figure 1:
  - Locate outfall/discharge point, complete data sheet with site information.
  - If new outfall/discharge point, assign identification number and mark location on map
  - If flow apparent, test discharge with field kit for temperature, pH, ammonia, and surfactants, collect additional sample if necessary, and record flow information and test results on data sheet. Readily observable sources of flow to the storm sewer will be noted. For example, landscape irrigation may be misdirected onto impermeable surfaces or irrigation runoff may be entering the drainage system.
    - Assign follow-up prioritization
      - Immediate - report to appropriate agency when discharge found, agency to follow up within one week.
      - High - notify stormwater manager, follow up within 30 days.
      - Low - notify stormwater manager conduct visual observations within 3 months.
    - In follow-up visits, test flow again with field test kits. If test results still indicate follow up necessary, collect additional samples for lab analysis, if necessary, and follow steps in “Finding the Source” section below.
  - If no flow apparent, evaluate the areas for indicators of pollution, i.e. the presence of algae, unusual vegetative growth, staining, bacterial sheens, or debris.
    - If indicators show a sign that pollution may exist, assign follow-up prioritization.
      - Immediate - report to appropriate agency when discharge found, agency to follow up within one week to check for dry-weather flow.
      - High - notify stormwater manager; follow up within 30 days to check for dry-weather flow.
      - Low - notify stormwater manager, conduct visual observations within 3 months for dry-weather flow.
    - In follow-up visits, if flow present, test with field test kits. If test results indicate follow up necessary, collect additional samples for lab analysis, if necessary, and follow steps in “Finding the Source” section below. If no flow is present on immediate or high priority sites, proceed to steps in “Finding the Source” section below.
  - If no dry-weather flow is present and no indication that pollution may exist, close outfall file.
  - If the outfall is submerged or otherwise unsafe to approach, the next available and safe location upstream from the outfall will be screened.

- The results of the Dry-Weather Screening will be ranked according to the guide in Table 1 and then used to locate problem areas and prioritize the locations for finding the source:

    - **Immediate** - If, in the opinion of the field crew, immediate action to address the dry-weather flow is indicated, the field crew will inform the stormwater program manager, or the appropriate agency if health or safety is a concern, record the incident, and ensure that the agency investigates the site within one week. Table 2 is a list of the current stormwater program managers and their contact information.
    - **High** - If flow is present and test results indicate follow up is necessary, but it does not appear to be of immediate concern, the stormwater manager will be notified and follow-up will be pursued within 30 days. If flow is again present, field crews will use field test kits to confirm results, and begin conducting dry-weather screening at accessible points upstream of the discharge until a potential source is found.
    - **Low** - If flow is present but test results indicate the discharge is most likely exempt, (groundwater for example), the site will be observed within 3 months to determine if conditions have changed and repeat testing is warranted.
    - **None** - No follow-up is needed.

- A field form will document the results of outfall screening and testing. A copy of the form is included as Figure 3. A separate form will be utilized for each visit.

- Any new or additional stormwater outfalls or discharge points will be reported in the next Progress Report.

- An illicit discharge reporting process (telephone, email, or other method) has been implemented. A system to log reports, assign them for follow-up, and document results of investigations is included in the process. Experience has shown that the most reliable reports come from municipal personnel; however, this reporting process has been coordinated with the Public Education Plan (PEP) in order to encourage the public to observe and notify county or local governmental units when illegal dumping or illicit discharges are suspected. The Community Reporting Forms are included in Appendix 3.

- Each community's schedule for completing the dry-weather screening will be consistent with the screening priority identification of their outfalls and discharge points as identified in Appendix 2.

6.2 FINDING THE SOURCE

The field investigation necessary to find the source of illicit discharges will be completed based on the results of the efforts in *Locating Problem Areas*. The process is illustrated in a flowchart in Figure 2.

Sites identified during the initial investigation that pose a significant and immediate health or environmental problem (immediate priority) will be brought to the attention of the community's stormwater program manager (Table 2), at the time the discharge is detected, and the appropriate agency or department; such as the Kent or Ottawa County Health Department, an adjacent community, or the MDEQ. That appropriate agency may provide useful information or assistance for the follow-up investigation within one week. Additional sample collection and laboratory analysis for parameters such as, fluoride, copper, phosphorus, ammonia, nitrite, nitrate, and *E. coli* will be considered, depending on the land use and suspected source of the illicit discharge.

The process for tracing illicit discharges that do not pose a significant and immediate health or environmental problem (high priority) to their source will be based on factors such as whether the area is known to have high bacteria problems or vulnerability to bacterial contamination, significant industrial or commercial development, dense housing without sanitary sewer connections, public notification or complaints, and the sensitivity of the receiving stream.

The exact procedure for tracking the illicit discharge will depend on the particular facts of each incident. Generally, if the discharge can be tracked by direct visual observation, the responsible party will be contacted and required to eliminate the discharge. If the source is not obvious, then manhole to manhole observations will be made to identify the source until the responsible party is identified and contacted.

If the source is still not identified through upstream investigations, more sophisticated means will be utilized such as:

- Televising the storm sewers or dye testing premises in the vicinity of a suspected illicit connection.
- Investigation of permissible point sources located upstream of outfalls with documented dry-weather flow.
- Investigation of complaints, reports, or notification of suspected illicit discharges.
- Distribution of letters to residents and businesses alerting them to the problem that is under investigation and soliciting their assistance in finding the source of an illicit discharge.
- A building-by-building evaluation where a potential illicit connection has been isolated to a small area.

If a low priority outfall was found to have similar test results in 3 months, the stormwater program manager will follow the steps outlined above to find the source and determine if the source of flow is exempt or requires the responsible party to be notified and the discharge eliminated.

If the source of an illicit discharge is traced to an MS4 owned by another permittee, the upstream stormwater program manager will be notified within one week of detection unless the severity of the discharge warrants immediate action. The stormwater program managers of all participating communities of the LGRW that own discharge points that enter another MS4 have agreed to coordinate tracking and eliminating illicit discharges in these situations. The agreement is included as Appendix 4. Notification will

consist of a phone call or email to the upstream MS4 stormwater program manager. The notification will include identifying the date and location where the suspected illicit discharge was detected and any other information about the discharge that will assist with the identification of its source. The notification will be recorded and supplemented by transmittal of the IDEP Dry-Weather Screening Data Sheet. The upstream MS4 stormwater program manager will then process the following steps outlined above.

The continuous communication between the community's stormwater program manager, the field crew, and other agencies during the investigation will ensure appropriate and timely actions are taken to find the source of an illicit discharge.

6.3 REMOVING/CORRECTING ILLICIT DISCHARGES AND CONNECTIONS

Those responsible for illicit connections will be notified to correct the problem. The property owner will be required to implement appropriate best management practices (BMPs) to eliminate the potential for illicit discharges, according to the community's ordinance or regulatory mechanism. A follow-up inspection will be conducted to ensure the correction is satisfactorily completed. Persons responsible for illicit discharges, including spill or dumping incidents, will be investigated and required to pursue reasonable clean-up. Where appropriate, they will be required to demonstrate taking measures to ensure that similar incidents will not occur. All illicit discharges should be eliminated as soon as practical taking into consideration the pollution potential of the discharge, the cost of elimination, and the measures needed to eliminate the discharge. Appropriate fines, penalties, and litigation will be considered.

7.0 MINIMIZING SEEPAGE FROM SEPTIC SYSTEMS AND SANITARY SEWERS

Each community will coordinate its IDEP with the local health department to assist in mitigating problems with failing OSDS. An OSDS found during the implementation of the IDEP to be infiltrating into a MS4 will be referred to the local health department.

A formal complaint is recorded when the local health department is informed that a septic system is in a state of failure. The field sanitarian responsible for that area visits the site to verify the condition of the septic system. The homeowner is ordered to pump the septic tanks, apply for a septic permit, and correct the situation in a timely manner if a public health hazard is determined to exist. Failure to comply with an order from the local health department can result in monetary penalties and/or condemnation of the dwelling as unfit for human habitation. The property owner will be encouraged to connect to the sanitary sewer where feasible. If sanitary sewers are not available, short- and long-term solutions for sewage disposal will be determined.

Each community will continue to conduct a preventative maintenance program on its wastewater collection and stormwater systems according to their SWPPIs. The maintenance may involve routine cleaning and/or television inspections that provide good assessments of pipe conditions and locates sites needing repairs. Each community will correct any sanitary system deficiencies identified in order to minimize exfiltration and seepage of sewage into the groundwater or stormwater drainage system. The potential for seepage from sanitary sewers into the stormwater drainage system will be investigated in the process of *Finding the Source* of illicit discharges. Sanitary sewer overflows (SSOs) or cross connections to a storm sewer will be corrected as soon as possible or in accordance with a state compliance action.

NOTE: Some communities rely on others for sewerage services and have little direct control over their operation and maintenance.

8.0 SPILL RESPONSE PROCEDURES

Reports by the public or municipal personnel of spills or suspicious discharges will be pursued by trained individuals. Persons responsible for illicit discharges, including spill or dumping incidents, will be investigated and compelled to pursue reasonable clean-up. Where appropriate, they will be required to demonstrate taking measures to ensure similar incidents will not occur. Appropriate fines, penalties, and litigation will be considered.

If a spill or suspicious discharge is found or reported, the stormwater program manager will be notified and initial information will be gathered. Records will be maintained regarding the incident from the first report to resolution. The Community Reporting Form is included in Appendix 3. Based on the initial information the stormwater coordinator will assess the severity of the situation. All reports will be considered an emergency until it is determined to be a non-emergency. Therefore, the Emergency Procedure will be implemented until the stormwater program manager determines that the incident is a non-emergency, at which point the Non-Emergency Procedure will be implemented.

The MDEQ supports the appropriate participation of its employees in emergency response activities for the purpose of protecting public health and the environment. In general, the MDEQ employees do not serve as "first responder" personnel. Rather, the MDEQ staff serve as technical consultants to, and coordinate their activity with, an on-scene incident commander, usually the local fire chief and/or a responsible party. Staff may serve as technical consultants either at the site of the emergency or by telephone or other means of communication.

Emergency Procedure

1) Is public safety at immediate risk? If yes, notify law enforcement and report to National Response Center.
2) Notify and solicit aid from other nearby or affected agencies, e.g. County Drain Commissioner and Road Commission. Engage Environmental Response Contractor, if needed.
3) If caused by Municipal Operations, report to the MDEQ District Office or Pollution Emergency Alert System (PEAS) if afterhours. If it is a Part 5 Rules material (oil causing visible sheen or >50 pounds of salt or listed pollutants over certain amounts) also report to 9-1-1.
4) If consistent with personnel safety, attempt to track the spill to its source. Gather more detailed and accurate information. Engage the responsible party. Attempt to persuade responsible party to take primary responsibility for preventing further damage and to initiate clean-up.
5) Attempt to stop the discharge through cooperation with responsible party or by utilizing internal resources or environmental response contractor.
6) Attempt to block the flow of pollutants to prevent further damage and to facilitate capture of spilled material.
7) Consider environmental monitoring to measure damage.

8) Clean up spilled material. Dispose as hazardous waste or liquid industrial waste.
9) Prepare written report to the MDEQ District Office within 10 days. Send a copy to the local health department.
10) Consider requiring the responsible party to implement procedures or to install facilities to ensure the incident does not occur again.
11) Consider civil and/or criminal actions.

Important Phone Numbers

MDEQ Grand Rapids District Office - (616) 356-0500
MDEQ PEAS - 1-800-292-4706 (calls from out-of-state - 1-517-373-7660)
National Response Center - 1-800-424-8802 or www.nrc.uscg.mil/nrchp.html
Kent County Drain Commissioner - (616) 336-3688
Ottawa County Drain Commissioner - (616) 994-4530

Potential Environmental Response Contractors

(Inclusion here does not imply any approval or any endorsement or qualifications; contacts are provided for convenience in an emergency only. Communities are encouraged to select a contractor before an emergency situation occurs.)

Young's Environmental Cleanup, Inc. Grand Rapids Area Office 4990 West River Drive, NE Comstock Park, MI 49321 Phone: (616) 785-3374 Fax: (616) 785-3401 24 hr: 1-800-4Youngs (496-8647) http://www.youngsenvironmental.com/	Plummer's Environmental Services, Inc. 10075 Sedroc Industrial Drive Byron Center, MI 49315 Toll Free: 1-800-878-3996 Office: 1-616-877-3930 Fax: 1-616-877-3937 www.plummersenvironmental.com/index.aspx
K&D Industrial Services, Inc. Corporate Offices Romulus, MI 48174 (734) 722-8922 Fax: (734) 729-8220 Grand Rapids Branch 2629 Prairie Road Wyoming, MI 49519 (616) 784-8900 Fax: (616) 534-5782 http://kdigroup.com/	Valley City Environmental Service 1040 Market Avenue, SW Grand Rapids, MI (616) 235-1500 Fax (616) 235-9507 24 hr Emergency Spill Response Numbers Please call 800.678.7035 / 616.235.1500 http://www.valleycityes.com/

Non-Emergency Procedure

1) Determine a level of urgency based on the nature of the spill and likely impact on health, safety, and environment.
2) If consistent with personnel safety, attempt to track the spill to its source. Gather more detailed and accurate information. Engage the responsible party. Attempt to persuade responsible party to take primary responsibility for preventing further damage and to initiate clean-up.
3) Report to the MDEQ District Office, or PEAS if after business hours.
4) Determine if internal resources are sufficient or if an Environmental Response Contractor is needed.
5) Attempt to stop the discharge through cooperation with responsible party or by utilizing internal resources or environmental response contractor.
6) Attempt to block the flow of pollutants to prevent further damage and to facilitate capture.
7) Clean up spilled material. Dispose as hazardous waste or liquid industrial waste.
8) Prepare written report to the MDEQ District Office within 10 days.
9) Consider requiring the responsible party to implement procedures or to install facilities to ensure the incident does not occur again.

9.0 DOCUMENTATION AND REPORTING

Progress Reports will be submitted to the MDEQ on the implementation status of the IDEP. The report will cover all of the decisions, actions, and results performed as part of the IDEP during the previous reporting period. The Progress Report will include:

- Documentation of actions taken to eliminate illicit discharges.
- For significant illicit discharges, a list of pollutants of concern, the estimated volume and load discharged, and the locations of the discharge into both the separate storm sewer system and the receiving water.
- The status of the program to minimize seepage from sanitary sewers and OSDS into the separate storm sewer system.
- Updated outfall mapping.
- A schedule for elimination of illicit connections that have been identified, but have yet to be eliminated.
- An evaluation of the effectiveness of the IDEP program. The evaluation will include:
    - An evaluation of the effectiveness of the detection methods used based on the number of illicit discharges detected.
    - An estimated quantification of the number of discharges prevented or eliminated.
    - An estimated quantification of the volume of illicit flow eliminated.
    - An assessment of the effectiveness of the program overall.

The goal of the program is to have a drainage system with no illicit discharges.

Figures

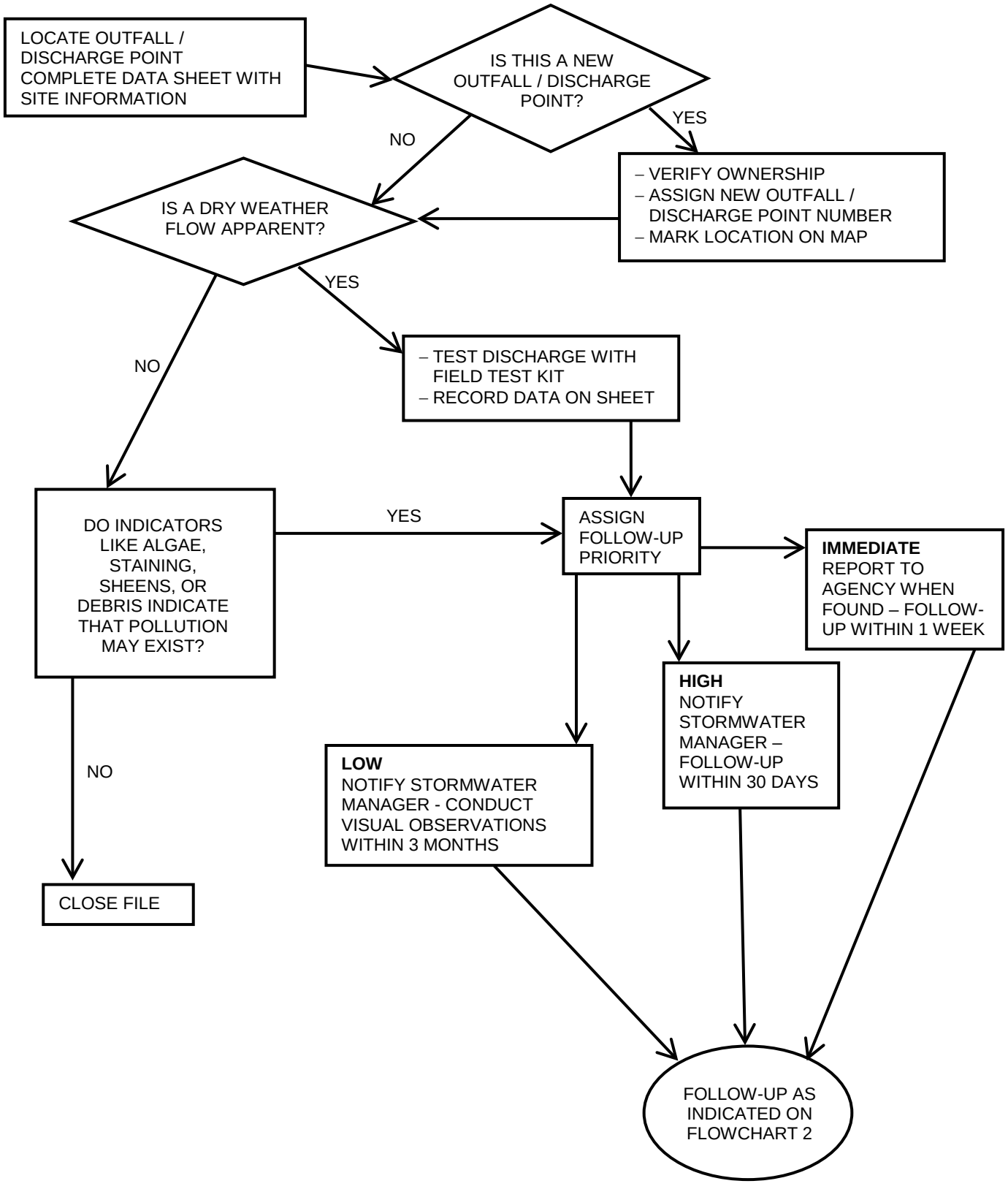

FIGURE 1: LOCATING PROBLEM AREAS

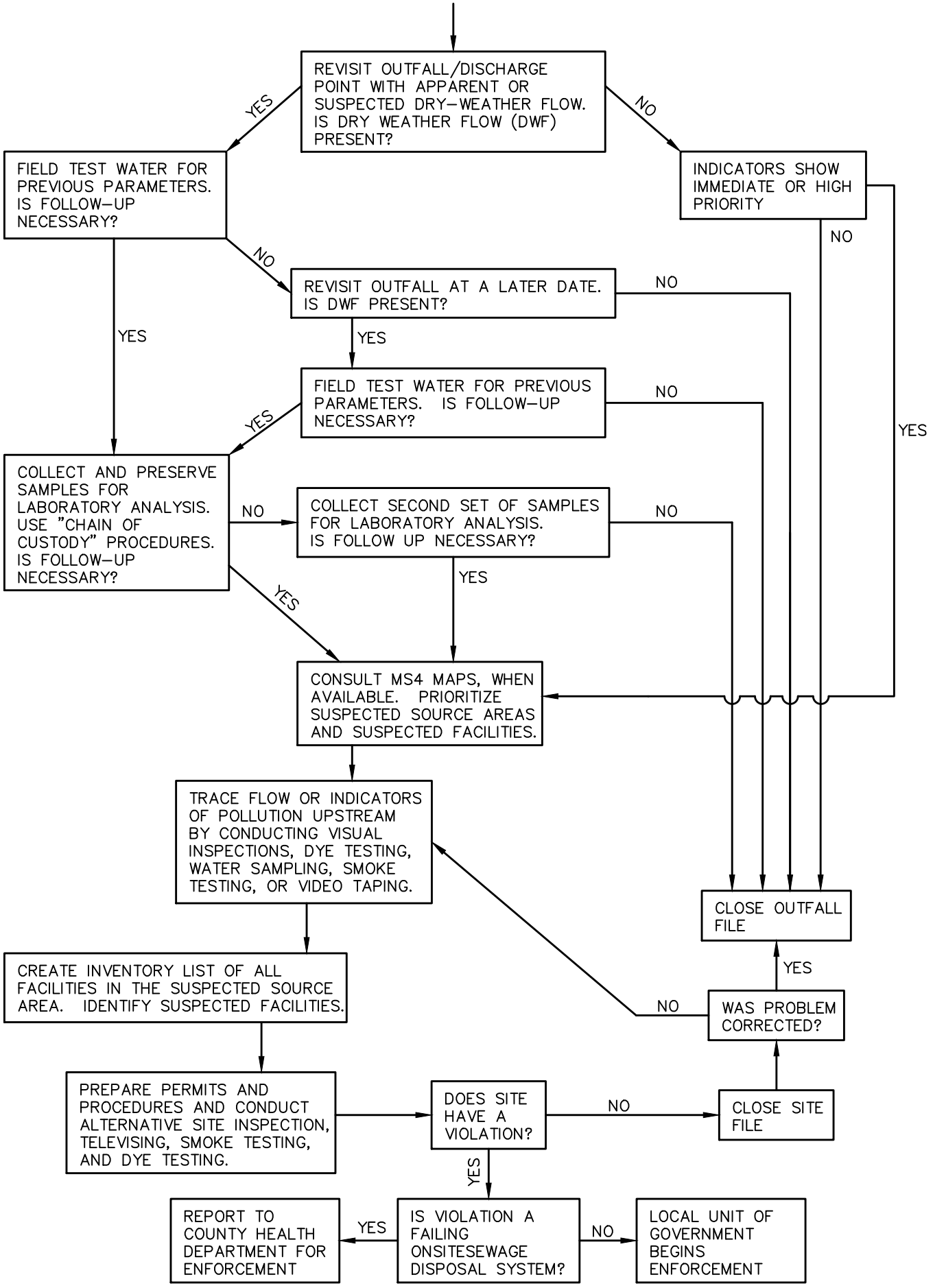

FIGURE 2: FINDING THE SOURCE

IDEP DRY WEATHER SCREENING DATA SHEET

FTC&H

GENERAL **Outfall ID** _____

Date _____ Time _____ Air Temp _____ °F Receiving Water _____

Crew Name _____ Date of Last Rain _____ ____ Clear/Sunny

Photograph # _____ _____ _____ ____ Partly Cloudy

GPS Coordinates _____ °N _____ °W (decimal degrees) ____ Overcast

TYPE OF OUTFALL

Material & Size

____ (in) Concrete ____ (in) PVC
____ (in) RCP ____ (in) Metal
____ (in) CMP ____ (in) Clay
____ (in) CPP ____ (ft) Ditch
____ (in) Other-describe below

Condition

____ Like New
____ Good
____ Broken
____ Impaired

Flow Observations

____ (in) Depth of flow in outfall
____ Standing water in pipe, no flow
____ Trace, insufficient to quantify
____ Dry, no water present

If evidence of Illicit Connection, describe below

FLOW OBSERVATIONS (skip if no water present in outfall)

Odor	___ None	___ Musty	___ Sewage	___ Rotten Egg	___ Gasoline	___ Oil	___ Other**	
Color	___ Clear	___ Light Brown	___ Dark Brown	___ Green	___ Grey	___ Black	___ Other**	
Turbidity	___ Clear	___ Slightly	___ Moderate	___ Highly	___ Opaque		___ Other**	
Floatables	___ None	___ Trash	___ Sewage	___ Foam	___ Oil Sheen		___ Other**	

OUTFALL AREA OBSERVATIONS

Deposits/Stains	___ None	___ Mineral	___ Sediment	___ Oily	___ Grease	___ Other**
Vegetation	___ None	___ Normal	___ Excessive	___ Algae		___ Other**
Debris	___ None	___ Tissue	___ Other**			

**If Other, include comments

OTHER OBSERVATIONS NEAR OUTFALL

Pollution Source	___ Debris/Trash	____ Construction Runoff	____ Road Crossing
	___ Septic System	____ Streambank Erosion	____ Gully Erosion
	___ Upland Source	____ Tile Outlet	____ Other**
Stream Bottom	___ Cobble/Gravel	____ Sand (coarse)	____ Muck/Silt (fine)
	___ Hardpan (solid clay)	____ Artificial	____ Other**

**If Other, include comments

FIELD TEST KIT ANALYSES

Parameter	Value	Units
pH	_____	SU
Surfactants	_____	H, M, L, or None
Ammonia	_____	mg/L
Temperature	_____	°F

OTHER ANALYSES

Parameter	Value	Units	Parameter	Value	Units
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Follow Up ___ None ___ High Priority ___ Other - explain ___ Additional information on attached sheet
___ Low Priority ___ Immediate

Comments _____

☐ Check if more comments are on the back

Figure 2

Tables

Table 1 - Field Testing Results Evaluation Guidelines

Parameter	Test Range	None	Low	High	Immediate
Temperature ºF	32-100	44 - 75	40 - 43 or 76 - 85	32 - 39 or 86 - 99	<32 or >100
pH	0-14	6 - 9.5	5 - 6 or 9.5 - 10.5	4 - 5 or 10.5 - 11	<4 or >11
Surfactants	detect presence	none	low or medium	high	
Ammonia ppm	0-6	0 - 1	1 - 3	3 - 6	>6

Table 2 – Storm Water Program Managers

Permittee	Storm Water Program Manager	Telephone Email
Allendale Charter Township	Mr. Jerry Alkema, Township Supervisor	(616) 895-6295 ext. 12 jerryalkema@allendale-twp.org
Cascade Charter Township	Mr. Steve Peterson Township Planner	(616) 949-1500 speterson@cascadetwp.com
East Grand Rapids, City of	Mr. Ken Feldt, Public Works Director	(616) 940-4817 kfeldt@eastgr.org
Ferrysburg, City of	Mr. Craig Bessinger, City Manager	(616) 842-5803 cbessinger@ferrysburg.org
Forest Hills Public Schools	Mr. Ron Boezwinkle, Director of Operations	(616) 493.8780 rboezwin@fhps.net
Georgetown Charter Township	Mr. Mike Hatkowski, Operations Coordinator	(616) 662-2800 mhatkowski@georgetown-mi.gov
Grand Haven, City of	Mr. William Hunter, Director of Public Works	(616) 855-5809 bhunter@grandhaven.org
Grand Rapids Charter Township	Mr. RJ Versluys Deputy Chief	(616) 361-7391 bversluys@grandrapidstwp.org
Grand Rapids, City of	Ms. Carrie Rivette Project Engineer	(616) 456-3057 crivette@grcity.us
Grandville, City of	Mr. Ron Carr, Director of Public Works	(616) 538-1990 carrr@cityofgrandville.com
Hudsonville, City of	Mr. Dutch Besteman, Public Works Superintendent	(616) 669-0200 ext. 1424 dbestema@hudsonville.org
Kent County Drain Commissioner and Admin.	Mr. Douglas Sporte, Deputy Drain Commissioner	(616) 336-3688 Doug.Sporte@Kentcountymi.gov
Kent County Road Commission	Mr. Wayne Harrall, Director of Engineering	(616) 242-6914 wharrall@kentcountyroads.net
Kentwood, City of	Mr. Ronald Woods, Director of Public Works	(616) 554-0824 woodsr@ci.kentwood.mi.us
Plainfield Charter Township	Mr. Rick Solle, Director of Public Services	(616) 363-9660 soller@plainfieldchartertwp.org
Rockford, City of	Mr. Jamie Davies, Public Services Director	616-893-0938 jdavies@rockford.mi.us
Sparta, Village of	Mr. Miles Ring, DPW Superintendent	(616) 262-7901 dpwdept@spartami.org
Spring Lake, Village of	Ms. Chris Burns Village Manager	(616) 842-1393 ext. 1002 christine@springlakevillage.org
Walker, City of	Ms. Bonnie Broadwater, Engineering Programs Coordinator	(616) 791-6327 bbroadwa@ci.walker.mi.us
Wyoming, City of	Mr. Aaron Vis, Environmental Services Inspector	(616) 261-3593 avis@wyomingmi.gov

Appendix 1

Appendix 1

Excerpts from
Illicit Discharge Detection and Elimination - A Guidance Manual for Program Development and Technical Assessments
By Edward Brown and Deb Caraco, Center for Watershed Protection, Ellicott City, Maryland 21043
and Robert Pitt, University of Alabama, Tuscaloosa, Alabama 35487
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Ammonia

Ammonia is a good indicator of sewage, since its concentration is much higher there than in groundwater or tap water. High ammonia concentrations may also indicate liquid wastes from some industrial sites. Ammonia is relatively simple and safe to analyze. Some challenges include the tendency for ammonia to volatilize (i.e., turn into a gas and become non-conservative) and its potential generation from non-human sources, such as pets or wildlife.

Boron

Boron is an element present in the compound borax, which is often found in detergent and soap formulations. Consequently, boron is a good potential indicator for both laundry wash water and sewage. Preliminary research from Alabama supports this contention, particularly when it is combined with other detergent indicators, such as surfactants (Pitt, IDDE Project Support Material). Boron may not be a useful indicator everywhere in the country since it may be found at elevated levels in groundwater in some regions and is a common ingredient in water softeners products. Program managers should collect data on boron concentrations in local tap water and groundwater sources to confirm whether it will be an effective indicator of illicit discharges.

Chlorine

Chlorine is used throughout the country to disinfect tap water, except where private wells provide the water supply. Chlorine concentrations in tap water tend to be significantly higher than most other discharge types. Unfortunately, chlorine is extremely volatile, and even moderate levels of organic materials can cause chlorine levels to drop below detection levels. Because chlorine is non-conservative, it is not a reliable indicator, although if very high chlorine levels are measured, it is a strong indication of a water line break, swimming pool discharge, or industrial discharge from a chlorine bleaching process.

Color

Color is a numeric computation of the color observed in a water quality sample, as measured in cobalt-platinum units (APHA, 1998). Both industrial liquid wastes and sewage tend to have elevated color values. Unfortunately, some “clean” flow types can also have high color values. Field testing by Pitt (IDDE Project Support Material) found high color values associated for all contaminated flows, but also many uncontaminated flows, which yielded numerous false

positives. Overall, color may be a good first screen for problem outfalls, but needs to be supplemented by other indicator parameters.

Conductivity

Conductivity, or specific conductance, is a measure of how easily electricity can flow through a water sample. Conductivity is often strongly correlated with the total amount of dissolved material in water, known as Total Dissolved Solids. The utility of conductivity as an indicator depends on whether concentrations are elevated in "natural" or clean waters. In particular, conductivity is a poor indicator of illicit discharge in estuarine waters or in northern regions where deicing salts are used (both have high conductivity readings). Field testing in Alabama suggests that conductivity has limited value to detect sewage or wash water (Pitt, IDDE Project Support Material). Conductivity has some value in detecting industrial discharges that can exhibit extremely high conductivity readings. Conductivity is extremely easy to measure with field probes, so it has the potential to be a useful supplemental indicator in subwatersheds that are dominated by industrial land uses.

Detergents

Most illicit discharges have elevated concentration of detergents. Sewage and washwater discharges contain detergents used to clean clothes or dishes, whereas liquid wastes contain detergents from industrial or commercial cleansers. The nearly universal presence of detergents in illicit discharges, combined with their absence in natural waters or tap water, makes them an excellent indicator. Research has revealed three indicator parameters that measure the level of detergent or its components-- surfactants, fluorescence, and surface tension (Pitt, IDDE Project Support Material). Surfactants have been the most widely applied and transferable of the three indicators. Fluorescence and surface tension show promise, but only limited field testing has been performed on these more experimental parameters. Methods and laboratory protocols for each of the three detergent indicator parameters are reviewed in Appendix F2.

E. coli, Enterococci and Total Coliform

Each of these bacteria is found at very high concentrations in sewage compared to other flow types, and is a good indicator of sewage or septage discharges, unless pet or wildlife sources exist in the subwatershed. Overall, bacteria are good supplemental indicators and can be used to find "problem" streams or outfalls that exceed public health standards. Relatively simple analytical methods are now available to test for bacteria indicators, although they still suffer from two monitoring constraints. The first is the relatively long analysis time (18-24 hours) to get results, and the second is that the waste produced by the tests may be classified as a biohazard and require special disposal techniques.

Fluorescence

Laundry detergents are highly fluorescent because optical brighteners are added to the formula to produce "brighter whites." Optical brighteners are the reason that white clothes appear to have a bluish color when placed under a fluorescent light. Fluorescence is a very sensitive indicator of the presence of detergents in discharges, using a fluorometer to measure fluorescence at specific wavelengths of light. Since no chemicals are needed for testing, fluorometers have minimal safety and waste disposal concerns. Some technical concerns do limit the utility of fluorescence as an indicator of illicit discharges. The concerns include the presence of fluorescence in non-illicit flow types such as irrigation water, the considerable variation of fluorescence between different detergent brands, and the lack of a readily standard or benchmark concentration for

optical brighteners. For example, Pitt (IDDE Project Support Material) measured fluorescence in mg/L of Tide™ brand detergent, and found the degree of fluorescence varied regionally, temporally, and between specific detergent formulations. Given these current limitations, fluorescence is best combined with other detergent indicators such as surfactants. Appendix F3 should be consulted for more detailed information on analytical methods and experimental field testing using fluorescence as an indicator parameter.

Fluoride

Fluoride is added to drinking water supplies in most communities to improve dental health, and normally found at a concentration of two parts per million in tapwater. Consequently, fluoride is an excellent conservative indicator of tap water discharges or leaks from water supply pipes that end up in the storm drain. Fluoride is obviously not a good indicator in communities that do not fluoridate drinking water, or where individual wells provide drinking water. One key constraint is that the reagent used in the recommended analytical method for fluoride is considered a hazardous waste, and must be disposed of properly.

Hardness

Hardness measures the positive ions dissolved in water and primarily include magnesium and calcium in natural waters, but are sometimes influenced by other metals. Field testing by Pitt (IDDE Project Support Material) suggests that hardness has limited value as an indicator parameter, except when values are extremely high or low (which may signal the presence of some liquid wastes). Hardness may be applicable in communities where hardness levels are elevated in groundwater due to karst or limestone terrain. In these regions, hardness can help distinguish natural groundwater flows present in outfalls from tap water and other flow types.

pH

Most discharge flow types are neutral, having a pH value around 7, although groundwater concentrations can be somewhat variable. pH is a reasonably good indicator for liquid wastes from industries, which can have very high or low pH (ranging from 3 to 12). The pH of residential wash water tends to be rather basic (pH of 8 or 9). The pH of a discharge is very simple to monitor in the field with low cost test strips or probes. Although pH data is often not conclusive by itself, it can identify problem outfalls that merit follow-up investigations using more effective indicators.

Potassium

Potassium is found at relatively high concentrations in sewage, and extremely high concentrations in many industrial process waters. Consequently, potassium can act as a good first screen for industrial wastes, and can also be used in combination with ammonia to distinguish wash waters from sanitary wastes. (See Chapter 12). Simple field probes can detect potassium at relatively high concentrations (5 mg/L), whereas more complex colorimetric tests are needed to detect potassium concentrations lower than 5 mg/L.

Surface Tension

Surfactants remove dirt particles by reducing the surface tension of the bubbles formed in laundry water when it is agitated. Reduced surface tension makes dirt particles less likely to settle on a solid surface (e.g., clothes or dishes) and become suspended instead on the water's surface. The visible manifestation of reduced surface tension is the formation of foam or bubbles on the water surface. Pitt (IDDE Project Support Material) tested a very simple procedure to

measure surface tension that quantifies the formation of foam and bubbles in sample bottles. Initial laboratory tests suggest that surface tension is a good indicator of surfactants, but only when they are present at relatively high concentrations. Section F3 provides a more detailed description of the surface tension measurement procedure.

Surfactants

Surfactants are the active ingredient in most commercial detergents, and are typically measured as Methyl Blue Active Substances (or MBAS). They are a synthetic replacement for soap, which builds up deposits on clothing over time. Since surfactants are not found in nature, but are always present in detergents, they are excellent indicators of sewage and wash waters. The presence of surfactants in cleansers, emulsifiers and lubricants also makes them an excellent indicator of industrial or commercial liquid wastes. In fact, research by Pitt (IDDE Project Support Material) found that detergents were an excellent indicator of "contaminated" discharges in Alabama (i.e., discharges that were not tap water or groundwater). Several analytical methods are available to monitor surfactants. Unfortunately, the reagents used involve toluene, chloroform, or benzene, each of which is considered hazardous waste with a potential human health risk. The most common analysis method uses chloroform as a reagent, and is recommended because it is relatively safer when compared to other reagents.

Turbidity

Turbidity is a quantitative measure of cloudiness in water, and is normally measured with a simple field probe. While turbidity itself cannot always distinguish between contaminated flow types, it is a potentially useful screening indicator to determine if the discharge is contaminated (i.e., not composed of tap water or groundwater).

Table 39: Indicator Parameters Used to Detect Illicit Discharges					
Parameter	Discharge Types It Can Detect				
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	Laboratory/Analytical Challenges
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Appendix 2

City of Walker Outfalls and Discharge Points 2018

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
1	Outfall			Blanch Drain West	Medium High
2	Outfall			Brandywine Creek	Medium High
3	Outfall			Detention	Medium High
4	Outfall			Detention	Medium High
5	Outfall			Detention	Medium High
6	Outfall			Detention	Medium High
7	Outfall			Detention	Medium High
8	Outfall			Detention	Medium High
9	Outfall			Detention	Medium High
10	Outfall			Goodale Estates Drain	Medium High
11	Outfall			Grand River	Medium High
12	Outfall			Grand River	Medium High
13	Outfall			Indian Mill Creek	Medium High
14	Outfall			Indian Mill Creek	Medium High
15	Outfall			Indian Mill Creek	Medium High
16	Outfall			Indian Mill Creek	Medium High
17	Outfall			Indian Mill Creek	Medium High
18	Outfall			Indian Mill Creek	Medium High
19	Outfall			Millennium Park Lake	Medium High
20	Outfall			Mullins Drain	Medium High
21	Outfall			Mullins Drain	Medium High
22	Outfall			Nason Drain	Medium High
23	Outfall			Nolan Drain	Medium High
24	Outfall			Nolan Drain	Medium High
25	Outfall			Orchard Ridge Drain	Medium High
26	Outfall			Riverside Drain	Medium High
27	Outfall			Sand Creek East Fork	Medium High
28	Outfall			Sand Creek East Fork	Medium High
29	Outfall			Sand Creek East Fork	Medium High
30	Outfall			Sand Creek East Fork	Medium High
31	Outfall			Sand Creek East Fork	Medium High
32	Outfall			Sexton Drain	Medium High
33	Outfall			Sexton Drain	Medium High

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
34	Outfall			Tallman Creek	Medium High
35	Outfall			Tallman Creek	Medium High
36	Outfall			Tallman Creek Drain	Medium High
37	Outfall			Tallman Creek Drain	Medium High
38	Outfall			Tallman Creek Drain	Medium High
39	Outfall			Tallman Creek Drain	Medium High
40	Outfall			Tallman Creek Drain	Medium High
41	Outfall			Tallman Creek Drain	Medium High
42	Outfall			Tallman Creek Drain	Medium High
43	Outfall			Tallman Creek Drain	Medium High
44	Outfall			Tallman Creek Drain	Medium High
45	Outfall			Trib to Brandywine Creek	Medium High
46	Outfall			Trib to Brandywine Creek	Medium High
47	Outfall			Trib To Grand River	Medium High
48	Outfall			Trib to Grand River	Medium High
49	Outfall			Trib to Grand River	Medium High
50	Outfall			Trib to Grand River	Medium High
51	Outfall			Trib to Indian Mill Creek	Medium High
52	Outfall			Trib to Indian Mill Creek	Medium High
53	Outfall			Trib to Indian Mill Creek	Medium High
54	Outfall			Trib to Indian Mill Creek	Medium High
55	Outfall			Trib To Indian Mill Creek	Medium High
56	Outfall			Trib to Indian Mill Creek	Medium High
57	Outfall			Trib To Indian Mill Creek	Medium High
58	Outfall			Trib to Indian Mill Creek	Medium High
59	Outfall			Trib to Indian Mill Creek	Medium High
60	Outfall			Trib to Indian Mill Creek	Medium High
61	Outfall			Trib to Indian Mill Creek	Medium High
62	Outfall			Trib to Indian Mill Creek	Medium High
63	Outfall			Trib to Sand Creek East Fork	Medium High
64	Outfall			Trib to Sand Creek East Fork	Medium High
65	Outfall			Trib to Sand Creek East Fork	Medium High
66	Outfall			Trib to Sand Creek East Fork	Medium High
67	Outfall			Trib to Sand Creek East Fork	Medium High
68	Outfall			Trib to Sand Creek East Fork	Medium High
69	Outfall			Trib to Sand Creek East Fork	Medium High
70	Outfall			Trib to Tallman Creek	Medium High
71	Outfall			Trib to Tallman Creek	Medium High
72	Outfall			Trib to Tallman Creek	Medium High
73	Outfall			Walker No 4 Drain	Medium High

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
74	Outfall			Walker No 4 Drain	Medium High
75	Outfall			Walker No 4 Drain	Medium High
76	Outfall			Wetland	Medium High
77	Outfall			Wetland	Medium High
78	Outfall			Wetland	Medium High
79	Outfall			Wetland	Medium High
80	Outfall			Wetland	Medium High
81	Outfall			Wetland	Medium High
82	Outfall			Wetland	Medium High
83	Outfall			Wetland	Medium High
84	Outfall			Wetland	Medium High
85	Outfall			Wetland	Medium High
86	Outfall			Wetland	Medium High
87	Outfall			Wetland	Medium High
88	Outfall			Wetland	Medium High
89	Outfall			Wetland	Medium High
90	Outfall			Wetland	Medium High
91	Outfall			Wetland	Medium High
92	Outfall			Wetland	Medium High
93	Outfall			Wetland	Medium High
94	Outfall			Wetland	Medium High
95	Outfall			Wetland	Medium High
96	Outfall			Wetland	Medium High
97	Outfall			Wetland	Medium High
98	Outfall			Wetland	Medium High
99	Outfall			Wetland	Medium High
100	Outfall			Wetland	Medium High
101	Outfall			Worden Drain	Medium High
102	Outfall			Worden Drain	Medium High
103	Outfall			Yard	Medium High
104	Outfall			York Creek Lower Drain	Medium High
105	Outfall			York Creek Lower Drain	Medium High
106	Outfall			York Creek Lower Drain	Medium High
D1	Discharge Point	-85.78487087310	43.02093115420	Sand Creek	Medium
D3	Discharge Point	-85.77573751850	43.01597851790	Sand Creek	Medium
D4	Discharge Point	-85.77428913200	43.01595933310	Nolan Drain	Medium
D5	Discharge Point	-85.77305465260	43.01595608590	Nolan Drain	Medium
D6	Discharge Point	-85.77173844820	43.01595067060	Nolan Drain	Medium
D7	Discharge Point	-85.77068388850	43.01594395990	Nolan Drain	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D8	Discharge Point	-85.77064476840	43.01594389030	Nolan Drain	Medium
D9	Discharge Point	-85.76938364350	43.01594136910	Nolan Drain	Medium
D10	Discharge Point	-85.76820580660	43.01593400170	Unnamed Pond	Medium
D11	Discharge Point	-85.77792133020	43.02208521970	Sand Creek	Medium
D12	Discharge Point	-85.76338951900	43.02138421450	Sand Creek	Medium
D13	Discharge Point	-85.76336048110	43.02071535080	Nolan Drain	Medium
D14	Discharge Point	-85.76699055210	43.01594063560	Nolan Drain	Medium
D15	Discharge Point	-85.76581285510	43.01592618950	Nolan Drain	Medium
D16	Discharge Point	-85.76465709390	43.01590438460	Nolan Drain	Medium
D17	Discharge Point	-85.76318418240	43.01587363960	Unnamed Pond	Medium
D18	Discharge Point	-85.76149391620	43.01582633650	Unnamed Pond	Medium
D19	Discharge Point	-85.76052369480	43.01580470280	Unnamed Pond	Medium
D20	Discharge Point	-85.75940249540	43.01578121680	Unnamed Pond	Medium
D21	Discharge Point	-85.75835032770	43.01576083500	Unnamed Wetland	Medium
D23	Discharge Point	-85.75709721290	43.01573505690	Unnamed Pond	Medium
D24	Discharge Point	-85.75602234570	43.01571297970	Unnamed Pond	Medium
D25	Discharge Point	-85.75490010530	43.01568959920	Unnamed Pond	Medium
D26	Discharge Point	-85.75397135500	43.01567086650	Unnamed Pond	Medium
D27	Discharge Point	-85.75195215040	43.01563681340	Unnamed Pond	Medium
D28	Discharge Point	-85.75072625110	43.01560866180	Unnamed Pond	Medium
D29	Discharge Point	-85.75041603750	43.01560203000	Unnamed Pond	Medium
D30	Discharge Point	-85.74923405240	43.01557418360	Unnamed Wetland	Medium
D32	Discharge Point	-85.74820622300	43.01555138440	Sand Creek	Medium
D33	Discharge Point	-85.76354042260	43.02526208590	Sand Creek	Medium
D34	Discharge Point	-85.76351373320	43.02455993340	Sand Creek	Medium
D35	Discharge Point	-85.76348509280	43.02381115210	Sand Creek	Medium
D36	Discharge Point	-85.76346122560	43.02318577750	Sand Creek	Medium
D37	Discharge Point	-85.76342015070	43.02213846050	Unnamed Pond	Medium
D38	Discharge Point	-85.74820446670	43.01555163520	Unnamed Pond	Medium
D39	Discharge Point	-85.70040813840	43.01741764840	Unnamed Pond	Medium
D40	Discharge Point	-85.69990726570	43.01624487470	York Creek Alpine Walker	Medium
D41	Discharge Point	-85.68900028590	43.02568611980	York Creek Alpine Walker	Medium
D42	Discharge Point	-85.68969230020	43.02580188060	York Creek Alpine Walker	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D43	Discharge Point	-85.69060445430	43.02580669970	York Creek Alpine Walker	Medium
D44	Discharge Point	-85.68784527630	43.02578457830	York Creek Alpine Walker	Medium
D45	Discharge Point	-85.68925860730	43.02276436240	York Creek Alpine Walker	Medium
D46	Discharge Point	-85.68925103130	43.02208880670	Grand River	Medium
D47	Discharge Point	-85.67788477680	43.00882454930	Grand River	Medium
D48	Discharge Point	-85.67827733670	43.00664553930	Grand River	Medium
D49	Discharge Point	-85.67770293890	43.00662694120	Grand River	Medium
D50	Discharge Point	-85.68046125020	43.00850243220	Grand River	Medium
D51	Discharge Point	-85.68215762200	43.00936279270	Grand River	Medium
D52	Discharge Point	-85.67976361340	43.00826695220	Grand River	Medium
D53	Discharge Point	-85.68833450070	43.00332746550	Grand River	Medium
D54	Discharge Point	-85.68845252340	42.99942556830	Unnamed Pond	Medium
D55	Discharge Point	-85.68621934340	43.00752388210	Grand River	Medium
D57	Discharge Point	-85.68735552160	43.00731599370	Grand River	Medium
D58	Discharge Point	-85.68502951900	43.00780100950	Grand River	Medium
D61	Discharge Point	-85.69858182370	43.01251109160	Unnamed Pond	Medium
D62	Discharge Point	-85.69856345670	43.01163314800	Unnamed Pond	Medium
D64	Discharge Point	-85.71846879240	43.01055280890	Unnamed Pond	Medium
D65	Discharge Point	-85.71945379420	43.01056239340	Unnamed Pond	Medium
D66	Discharge Point	-85.72474319240	43.00290252010	Indian Mill Creek	Medium
D70	Discharge Point	-85.76507383520	43.00142121200	Unnamed Pond	Medium
D71	Discharge Point	-85.75901417040	43.00269201310	Indian Mill Creek	Medium
D74	Discharge Point	-85.76019475250	43.01365661410	Indian Mill Creek	Medium
D75	Discharge Point	-85.76191004270	43.00582177220	Nolan Drain	Medium
D76	Discharge Point	-85.76490452120	43.00673428060	Nolan Drain	Medium
D78	Discharge Point	-85.78604513750	43.00362949360	Unnamed Pond	Medium
D79	Discharge Point	-85.78556827810	43.00464241510	Nolan Drain	Medium
D80	Discharge Point	-85.78375122650	43.00489385590	Nolan Drain	Medium
D81	Discharge Point	-85.78310429150	43.00600650380	Orchard Ridge	Medium
D82	Discharge Point	-85.78139101020	43.00657834690	Orchard Ridge	Medium
D83	Discharge Point	-85.77470188240	43.00401878290	Orchard Ridge	Medium
D84	Discharge Point	-85.77427204680	43.00402587010	Orchard Ridge	Medium
D85	Discharge Point	-85.77442515120	43.00451604100	Orchard Ridge	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D86	Discharge Point	-85.77472419960	43.00451242540	Deerfield Drain	Medium
D87	Discharge Point	-85.77444846960	43.00500116370	Deerfield Drain	Medium
D88	Discharge Point	-85.77388767270	43.00499967530	Deerfield Drain	Medium
D89	Discharge Point	-85.77016027310	43.00710758890	Deerfield Drain	Medium
D90	Discharge Point	-85.76946240470	43.00712551070	Deerfield Drain	Medium
D92	Discharge Point	-85.78218130240	42.98680027090	Deerfield Drain	Medium
D93	Discharge Point	-85.74995722560	42.98786384070	Unnamed Pond	Medium
D94	Discharge Point	-85.74976875440	42.98804108900	Unnamed Pond	Medium
D95	Discharge Point	-85.74901725520	42.98827062580	Tallman Creek Drain	Medium
D96	Discharge Point	-85.74872644060	42.98845668060	Worden Drain	Medium
D97	Discharge Point	-85.75020717660	42.98663909870	Worden Drain	Medium
D98	Discharge Point	-85.75011045160	42.98724266250	Worden Drain	Medium
D99	Discharge Point	-85.74967509860	42.99331074060	Worden Drain	Medium
D100	Discharge Point	-85.74844909450	42.99328973430	Worden Drain	Medium
D101	Discharge Point	-85.74726628150	42.99363406080	Worden Drain	Medium
D102	Discharge Point	-85.75079679520	42.99207792540	Brandywine Creek	Medium
D103	Discharge Point	-85.75085399610	42.99172596720	Brandywine Creek	Medium
D104	Discharge Point	-85.75216521960	42.99138740580	Brandywine Creek	Medium
D105	Discharge Point	-85.75345811860	42.99162392350	Brandywine Creek	Medium
D106	Discharge Point	-85.75348561900	42.99066877290	Brandywine Creek	Medium
D107	Discharge Point	-85.75423708850	42.99122322120	Brandywine Creek	Medium
D108	Discharge Point	-85.75400592710	42.99105406100	Brandywine Creek	Medium
D109	Discharge Point	-85.75509220270	42.99186271700	Brandywine Creek	Medium
D111	Discharge Point	-85.75600857870	42.99257742650	Brandywine Creek	Medium
D112	Discharge Point	-85.75659277390	42.99301272620	Brandywine Creek	Medium
D114	Discharge Point	-85.76640200790	42.99935264420	Brandywine Creek	Medium
D115	Discharge Point	-85.75637955360	42.99960506670	Brandywine Creek	Medium
D117	Discharge Point	-85.75513792610	43.00026890620	Mullins Drain	Medium
D120	Discharge Point	-85.75542563570	42.99592885920	Nolan Drain	Medium
D121	Discharge Point	-85.75544130140	42.99620501880	Mullins Drain	Medium
D122	Discharge Point	-85.75003267030	42.98772234110	Mullins Drain	Medium
D123	Discharge Point	-85.75004042840	42.98767450350	Mullins Drain	Medium
D124	Discharge Point	-85.76072742580	42.97378163140	Mullins Drain	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D125	Discharge Point	-85.75880068250	42.97382664160	Worden Drain	Medium
D126	Discharge Point	-85.75804646200	42.97368870320	Worden Drain	Medium
D127	Discharge Point	-85.75797459990	42.97353781630	Lincoln Lawns Drain	Medium
D128	Discharge Point	-85.75608117470	42.97219324220	Lincoln Lawns Drain	Medium
D129	Discharge Point	-85.75906384010	42.97987697170	Lincoln Lawns Drain	Medium
D131	Discharge Point	-85.75842333990	42.98123054580	Lincoln Lawns Drain	Medium
D132	Discharge Point	-85.75934221120	42.98311629680	Sexton Drain	Medium
D134	Discharge Point	-85.75690189850	42.98184023250	Unnamed Pond	Medium
D135	Discharge Point	-85.75942990260	42.98596286910	Unnamed Pond	Medium
D136	Discharge Point	-85.75042943720	42.98651544870	Unnamed Pond	Medium
D137	Discharge Point	-85.74937293270	42.98649756660	Unnamed Pond	Medium
D138	Discharge Point	-85.74794630930	42.98645383670	Unnamed Pond	Medium
D139	Discharge Point	-85.73426135210	42.96095373670	Brandywine Creek	Medium
D140	Discharge Point	-85.75786109700	42.96038137190	Brandywine Creek	Medium
D141	Discharge Point	-85.75787529710	42.96134897330	Brandywine Creek	Medium
D142	Discharge Point	-85.75645961190	42.96818925740	West Way Woods	Medium
D143	Discharge Point	-85.75661755910	42.96818536700	Unnamed Stream	Medium
D144	Discharge Point	-85.75601059910	42.96819991500	Unnamed Stream	Medium
D146	Discharge Point	-85.76833624760	42.96721689110	Sexton Drain	Medium
D147	Discharge Point	-85.77139345530	42.96202939470	Sexton Drain	Medium
D148	Discharge Point	-85.76961749540	42.97216467190	Sexton Drain	Medium
D149	Discharge Point	-85.76904066960	42.97137917490	Unnamed Stream	Medium
D152	Discharge Point	-85.66690844410	43.02474277760	Geigle Drain	Medium
D153	Discharge Point	-85.66828249540	43.02606757870	Tallman Creek Drain	Medium
D154	Discharge Point	-85.66470667550	43.02406224400	Tallman Creek Drain	Medium
D155	Discharge Point	-85.69060618810	43.02580216540	Unnamed Stream	Medium
D156	Discharge Point	-85.68899883990	43.02568661630	Grand River	Medium
D157	Discharge Point	-85.68900085320	43.02568659310	Grand River	Medium
D158	Discharge Point	-85.68900088480	43.02568807110	Grand River	Medium
D159	Discharge Point	-85.71176227900	43.01698522920	York Creek Alpine Walker	Medium
D160	Discharge Point	-85.76353957190	43.02526201700	York Creek Alpine Walker	Medium
D161	Discharge Point	-85.76355192640	43.02527078460	York Creek Alpine Walker	Medium
D162	Discharge Point	-85.76351554170	43.02455775060	York Creek Alpine Walker	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D163	Discharge Point	-85.76348658630	43.02381489740	Unnamed Stream	Medium
D164	Discharge Point	-85.76345221940	43.02319102280	Sand Creek	Medium
D165	Discharge Point	-85.76342046120	43.02214497620	Sand Creek	Medium
D166	Discharge Point	-85.76339515560	43.02138424130	Sand Creek	Medium
D167	Discharge Point	-85.76339515560	43.02138424130	Sand Creek	Medium
D168	Discharge Point	-85.76339515560	43.02138424130	Sand Creek	Medium
D169	Discharge Point	-85.76335998460	43.02072470250	Sand Creek	Medium
D170	Discharge Point	-85.74921963860	43.01556828900	Sand Creek	Medium
D171	Discharge Point	-85.75041023650	43.01560006340	Sand Creek	Medium
D172	Discharge Point	-85.75041023650	43.01560006340	Sand Creek	Medium
D173	Discharge Point	-85.75072954050	43.01562257030	Sand Creek	Medium
D175	Discharge Point	-85.74597465140	43.01603238690	Unnamed Wetland	Medium
D176	Discharge Point	-85.75195119360	43.01563747950	Unnamed Wetland	Medium
D177	Discharge Point	-85.75196009740	43.01563407670	Unnamed Wetland	Medium
D178	Discharge Point	-85.75196009740	43.01563407670	Unnamed Wetland	Medium
D179	Discharge Point	-85.75489785390	43.01568752770	Unnamed Pond	Medium
D180	Discharge Point	-85.75602119750	43.01572335300	Unnamed Pond	Medium
D181	Discharge Point	-85.75835258520	43.01576758280	Unnamed Pond	Medium
D182	Discharge Point	-85.75940366350	43.01578448170	Unnamed Pond	Medium
D183	Discharge Point	-85.75936189260	43.01592337360	Unnamed Pond	Medium
D184	Discharge Point	-85.76051324690	43.01580724980	Unnamed Pond	Medium
D185	Discharge Point	-85.76149265210	43.01583159010	Unnamed Pond	Medium
D187	Discharge Point	-85.76319088410	43.01587353280	Unnamed Pond	Medium
D188	Discharge Point	-85.76465539520	43.01590512020	Unnamed Pond	Medium
D189	Discharge Point	-85.76581458480	43.01593711670	Unnamed Pond	Medium
D190	Discharge Point	-85.76698657080	43.01593929230	Unnamed Pond	Medium
D191	Discharge Point	-85.76822125280	43.01593410020	Nolan Drain	Medium
D192	Discharge Point	-85.76821646560	43.01592097940	Nolan Drain	Medium
D193	Discharge Point	-85.76938007200	43.01594959160	Nolan Drain	Medium
D194	Discharge Point	-85.77173728600	43.01594381070	Nolan Drain	Medium
D195	Discharge Point	-85.77305763310	43.01595399120	Nolan Drain	Medium
D196	Discharge Point	-85.77306219630	43.01595723050	Nolan Drain	Medium
D197	Discharge Point	-85.77573438850	43.01598045430	Nolan Drain	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D198	Discharge Point	-85.77792144750	43.02208449800	Nolan Drain	Medium
D199	Discharge Point	-85.77792275130	43.02208350870	Sand Creek	Medium
D200	Discharge Point	-85.78487270670	43.02093122250	Sand Creek	Medium
D201	Discharge Point	-85.78487166450	43.02093323320	Sand Creek	Medium
D202	Discharge Point	-85.76946114270	43.00712433680	Sand Creek	Medium
D203	Discharge Point	-85.76946919540	43.00712125720	Sand Creek	Medium
D204	Discharge Point	-85.77388779180	43.00499973060	Unnamed Pond	Medium
D205	Discharge Point	-85.77472557960	43.00451338890	Unnamed Pond	Medium
D206	Discharge Point	-85.77443414100	43.00451917200	Unnamed Pond	Medium
D207	Discharge Point	-85.77426662340	43.00402705670	Unnamed Pond	Medium
D208	Discharge Point	-85.77469924620	43.00401733420	Deerfield Drain	Medium
D209	Discharge Point	-85.77469919600	43.00401512890	Deerfield Drain	Medium
D210	Discharge Point	-85.77575536240	43.00500194880	Deerfield Drain	Medium
D211	Discharge Point	-85.77575498730	43.00500223340	Deerfield Drain	Medium
D212	Discharge Point	-85.72474158680	43.00290001810	Deerfield Drain	Medium
D213	Discharge Point	-85.72473336980	43.00290624680	Deerfield Drain	Medium
D216	Discharge Point	-85.71946347060	43.01057388570	Deerfield Drain	Medium
D217	Discharge Point	-85.71946359450	43.01057954740	Deerfield Drain	Medium
D218	Discharge Point	-85.69858673260	43.01251212400	Indian Mill Creek	Medium
D220	Discharge Point	-85.69828893570	43.00982846460	Indian Mill Creek	Medium
D221	Discharge Point	-85.69828901310	43.00983205240	Unnamed Pond	Medium
D222	Discharge Point	-85.68622768890	43.00752432540	Unnamed Pond	Medium
D223	Discharge Point	-85.68623278740	43.00752426670	Unnamed Pond	Medium
D224	Discharge Point	-85.68504031590	43.00780370790	Unnamed Pond	Medium
D225	Discharge Point	-85.68504031590	43.00780370790	Unnamed Pond	Medium
D226	Discharge Point	-85.68216497280	43.00936669150	Unnamed Pond	Medium
D227	Discharge Point	-85.68216474980	43.00935621950	Unnamed Pond	Medium
D228	Discharge Point	-85.75638039300	42.99959995610	Grand River	Medium
D229	Discharge Point	-85.75513709790	43.00026649150	Grand River	Medium
D230	Discharge Point	-85.75514753760	43.00026636520	Grand River	Medium
D231	Discharge Point	-85.75544755880	42.99621317950	Grand River	Medium
D232	Discharge Point	-85.75350030670	42.99066782100	Grand River	Medium
D233	Discharge Point	-85.74844635340	42.99328886250	Grand River	Medium

Walker ID	Outfall/Discharge Point	Latitude	Longitude	Receving Water	Prioritization
D234	Discharge Point	-85.74710407590	42.98880658530	Mullins Drain	Medium
D235	Discharge Point	-85.74811309440	42.98646197090	Mullins Drain	Medium
D236	Discharge Point	-85.74935208910	42.98649379060	Mullins Drain	Medium
D237	Discharge Point	-85.75042838510	42.98652756130	Mullins Drain	Medium
D238	Discharge Point	-85.76507389100	43.00126009640	Brandywine Creek	Medium
D239	Discharge Point	-85.76508027040	43.00126001870	Brandywine Creek	Medium
D240	Discharge Point	-85.78262400770	42.98363572390	Worden Drain	Medium
D241	Discharge Point	-85.77645070710	42.97892815530	Worden Drain	Medium
D242	Discharge Point	-85.77644724430	42.97887632980	Worden Drain	Medium
D243	Discharge Point	-85.77632868000	42.97785002000	Worden Drain	Medium
D244	Discharge Point	-85.77402337700	42.97751024770	Nolan Drain	Medium
D245	Discharge Point	-85.77277890660	42.97743487210	Nolan Drain	Medium
D246	Discharge Point	-85.77154439320	42.97705581520	Tallman Creek Drain	Medium
D249	Discharge Point	-85.76948708650	42.97350773620	Tallman Creek Drain	Medium
D250	Discharge Point	-85.75562749930	42.98612101200	Tallman Creek Drain	Medium
D251	Discharge Point	-85.75934221120	42.98311629680	Tallman Creek Drain	Medium
D252	Discharge Point	-85.75562749930	42.98612101200	Tallman Creek Drain	Medium
D253	Discharge Point	-85.75562749930	42.98612101200	Tallman Creek Drain	Medium
D254	Discharge Point	-85.75880068250	42.97382664160	Tallman Creek Drain	Medium
D255	Discharge Point	-85.75661755910	42.96818536700	Tallman Creek Drain	Medium
D256	Discharge Point	-85.75645961190	42.96818925740	Tallman Creek Drain	Medium
D257	Discharge Point	-85.76961749540	42.97216467190	Worden Drain	Medium
D258	Discharge Point	-85.76961994700	42.97229743890	Worden Drain	Medium
D259	Discharge Point	-85.76961994700	42.97229743890	Worden Drain	Medium
D260	Discharge Point	-85.76833624760	42.96721689110	Worden Drain	Medium
D261	Discharge Point	-85.76833624760	42.96721689110	Lincoln Lawns Drain	Medium
D266	Discharge Point	-85.68568936950	43.00646236220	Sexton Drain	Medium

Appendix 3

What is Storm Water Runoff?

When it rains, storm water flows over lawns, streets, and parking lots. Storm water runoff can carry dirt, fertilizers, and motor oil into storm drains, which are often located alongside streets and parking lots.

Where do Storm Drains Lead?

Storm drains lead directly to nearby rivers, streams, and lakes without any type of treatment.

How Can I Help?

- Report anyone dumping anything down a storm drain.
- Take used motor oil to a quick lube or auto shop.
- Dispose of pet waste in a trash can.
- Avoid fertilizing your lawn before it rains.
- Wash your car on your lawn or take it to a commercial car wash.

Grand River, Grand Haven Harbor

www.lowergrandriver.org

Postage

How to Report Water Pollution

Citizen Report Form

LOWER GRAND RIVER ORGANIZATION of WATERSHEDS

WALKER

FROM SOLID ROOTS · STRONG BRANCHES

If you see anyone dumping anything into a storm drain, REPORT IT.

Any substance, trash, or debris dumped into a storm drain will travel to our streams and lakes, and eventually the Grand River. Motor vehicle fluids, paint, grass clippings, and restaurant wastes should be disposed of properly.

Violators can be fined.

The Illicit Discharge Ordinance provides legal authority to enforce fines for violations. To report dumping, please fill out this report and return it in one of four ways.

1. E-mail: bbroadwa@ci.walker.mi.us
2. Fax: (616) 791-6808
3. Phone: (616)791-6327
4. Mail
   Name: Bonnie Broadwater
   Address: 4243 Remembrance Rd. NW
   Walker, MI 49534

Grass clippings blown into a storm drain

Date(s) pollution was observed:

_____

Location pollution was observed (address, street, city or township):

_____

_____

Name of person(s) or company involved (if known):

_____

_____

_____

Please describe the pollution (include photographs if possible):

_____

_____

_____

_____

_____

_____

Please remember that all reports are investigated. Inspectors, however, are limited if a report is submitted anonymously as they cannot contact the submitter for more information.

If you would like to remain anonymous, it is highly recommended that you include photographs of the problem with your anonymous report.

Your contact information (optional):

Name:_____

Phone: _____

E-mail: _____

Address: _____

_____

Date this report was submitted:

_____

❒ Check here to receive a follow-up report.

Appendix 4

IDEP Inter-jurisdictional Cooperation

State and federal law requires regulated Municipal Separate Storm Sewer Systems (MS4s) to have effective programs to find and eliminate illicit discharges to their systems (Illicit Discharge Elimination Plan). In some cases one community's MS4 discharges into another community's MS4.

We, as Storm Water Program Managers for our communities, recognize this requirement. We agree to work cooperatively with other MS4 communities where an illicit discharge is suspected to originate across our jurisdictional boundaries.

By signing this agreement, our community commits to investigating dry-weather discharges that appear at outfalls. We accept responsibility for notifying upstream owners if an illicit discharge is found to enter our MS4, and commit to abating discharges that are found to be leaving our MS4. These activities will be conducted pursuant to the procedures and timelines identified in the IDEP.

Bonnie Broadwater
NAME
Storm Water Program Manager for City of Walker