Cascade Charter Township

Illicit Discharge Elimination Plan

Revisions for 2013

Prepared for:
The Lower Grand River Watershed

FOR MDEQ REVIEW AND APPROVAL

April 10, 2013
Project Nos. F99511SW / G120878

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

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LIST OF ABBREVIATIONS/ACRONYMS

BMP	Best Management Practice
GPS	Global Positioning System
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
SSOs	Sanitary Sewer Overflows
SWPPI	Storm Water 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 sections:

- IDEP goals
- Legal authority
- Discharge point map and list
- 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 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 storm water 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
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, 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-way. When evidence of an illicit discharge to a KCRC ditch or drain is found, and voluntary correction is not forthcoming, the KCRC will work with the KCDC, Kent County Health Department, local unit of government, local policing authority and 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.

4.0 DISCHARGE POINT MAP AND LIST

Each permittee will keep its storm sewer system map and list updated, showing the location of all discharge points the permittee owns, and the names and locations of all surface waters of the State that receive discharges from the permittee's MS4. Maps may be accompanied by narrative descriptions for portions of the system. The lists will include a discrete identification number, description of the location of the outfall or discharge point, the name of the receiving water, the latitude and longitude, and the prioritization given to that point for screening purposes.

The map and list updates will be retained by the permittee and made available to the MDEQ upon request. Newly discovered discharge points will be identified in the next progress report.

A copy of the current map and/or list for each permittee 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 an informational flyer or similar mechanism by December 2013.

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 stand-up 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 stand-up 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 storm water outfalls for evidence of illicit discharges. The second step will be *Finding the Source* of any illicit discharges and will involve tracing illicit discharges through the storm water drainage system to the source of the discharge or the illicit connection. 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.

6.1 LOCATING PROBLEM AREAS

Locating the presence of unauthorized discharges to the MS4 will be conducted during the permit cycle using the following techniques:

- Priority areas for detecting non-storm water discharges to the MS4 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 will receive or has received dry-weather screening during the period from 2008 to 2013. All others will be scheduled for dry-weather screening by 2019, unless reports of suspected illicit discharges warrant expedited screening or investigation.

- 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 MS4 discharge points will be completed in accordance with the following, and as illustrated in Figure 1:

- The area of the outfall will be evaluated for indicators of pollution, i.e. the presence of algae, unusual vegetative growth, staining, bacterial sheens, or debris.
- If flow is observed, its depth will be measured and its characteristics noted, such as: odor, color, turbidity, suds, oil sheens, sewage, and floatable materials.
- If the dry-weather investigation indicates the presence of flow, and a field test kit is available, then the discharge will be immediately analyzed for temperature, pH, ammonia, and surfactants. Field test kits will generally be available during screening; however, some screening may be conducted in conjunction with other activities. If a field test kit is not available, a second visit will be scheduled as soon as is practical (but within 3 weeks) to sample and further investigate the outfall. (A discussion of indicator parameters is excerpted from the U.S. Environmental Protection Agency's Illicit Discharge Detection and Elimination Manual in Appendix 1.)
- If indicators like odor, color, deposits, stains, debris, floatables, or vegetation indicate that pollution may exist but no flow is present, a second visit will be made to further investigate the outfall. If flow is present on the second visit, a field test kit will be utilized to analyze for temperature, pH, ammonia, and surfactants. If an illicit discharge is suspected based on observed conditions, 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.
- If the outfall is submerged or otherwise unsafe to approach, the next available and safe location upstream from the outfall will be screened.
- If there is no dry-weather flow and there are no indicators that pollution may exist, no follow-up will be needed.

- The results of the Dry-Weather Screening will be evaluated and outfalls will be prioritized for follow-up as follows:
  - None - No follow-up is needed.
  - Low - Another Dry-Weather Screening will be conducted within 13 months, unless a different follow-up action is taken based on the nature of the suspicion.
  - High - Follow-up will be pursued within 30 days.
  - Immediate - Follow-up will be pursued as soon as possible (the same day or within a week) including a report to the appropriate agency responsible for the type of illicit discharge.

  Table 1 will be used as a guide in establishing follow-up priorities. Qualitative outfall characteristics will also be considered when establishing priorities.

- If dry-weather flow is present, 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. If, in the opinion of the field crew, immediate action to address the dry-weather flow is indicated, the field crew will inform the storm water program manager who will

decide on the appropriate action. Table 2 is a list of the current storm water program managers and their contact information.

- A report form will document the results of outfall screening and testing. A copy of the report form is included as Figure 2. A separate report form should be utilized for each visit.

- Any new or additional storm water outfalls will be reported in the next Progress Report.

- An illicit discharge reporting process (telephone, e-mail, 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 in order to encourage the public to observe and notify county or local governmental units when illegal dumping or illicit discharges are suspected. An Example Community IDEP Log is presented in Figure 3.

- If the dry-weather screening on the outfall indicates a potential illicit discharge, then the storm sewer system upstream from that point will be investigated to determine the source of the discharge. This information will be used to make a determination on whether the discharge is illicit. If it is illicit it will be eliminated.

- Field crews will conduct dry-weather screening at MS4 to MS4 discharge points where dry-weather screening of the downstream outfall indicates a possible illicit discharge and where there is a known or suspected problem upstream. It is reasonable to conclude that if there is no indication of an illicit discharge at the most downstream point on a storm sewer, then there will be no indication of an illicit discharge upstream of that point.

- When appropriate, additional observations/measurements may be made, such as:
  - Evaluation of outfall structure condition
  - Size and material of outfall pipe
  - Taking a digital photograph
  - Additional chemical/biological analyses
  - Identification of undocumented connections or suspected pollution sources
  - Global Positioning System (GPS) reading (Latitude and Longitude)

- Each community's schedule for completing the dry-weather screening will be consistent with the priority identification of their outfalls and discharge points 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*. Sites identified during the initial investigation that pose a

significant and immediate health or environmental problem (immediate and high-priority) will be brought to the attention of the community's storm water program manager (see Table 2) 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. The continuous communication between the community's storm water 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. The prioritization for tracing illicit discharges that do not pose a significant and immediate health or environmental problem 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, then manhole to manhole observations will be made to identify the source. Otherwise, more sophisticated means will be utilized such as,

- Inspection and/or testing the discharges within the separate storm water drainage system.
- 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 the source of an illicit discharge is traced to an MS4 owned by another permittee, the upstream storm water program manager will be notified within one week of detection unless the severity of the discharge warrants immediate action. The Storm Water 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. Notification will consist of a phone call or email to the upstream MS4 Storm Water 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. When immediate action is indicated, the upstream MS4 Storm Water Program Manager will vigorously pursue the matter. Where an illicit discharge has been suspected, the upstream MS4 Storm Water Program Manager will ensure that dry-weather screening of their discharge point is conducted within 13 months, unless, (a) the illicit discharge is identified and eliminated; (b) the illicit discharge is identified to originate elsewhere; or (c) more effective means are being pursued to locate the illicit discharge. Once the illicit discharger is

identified, the community with jurisdiction over the discharge will promptly take action to eliminate the discharge. The illicit discharge 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. Communication between the Program Managers will continue until the illicit discharge is confirmed to be eliminated or otherwise resolved.

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. A follow-up inspection will be conducted to ensure the correction is satisfactorily completed. Failure to correct the problem within a reasonable time will result in increasingly serious actions to compel correction in accordance with available enforcement mechanisms as provided for by local ordinance or authority. Written procedures for these situations are ill-advised because the facts of each instance are likely unique. Consultation with legal counsel is appropriate. However, in deciding which compliance and enforcement action is the most appropriate response for a violation, consideration needs to be given to a number of factors. These factors include, but are not limited to, the violation's effect on program integrity; the severity and duration of the violation; any public health risk or resource damage caused by the violation; the compliance history of the violator; and the willfulness, negligence, and recalcitrance of the violator. To ensure that violations are resolved as quickly and efficiently as possible, a progressive compliance program will be utilized. Failures to comply with previous compliance and enforcement actions must subject the violator to progressively stronger actions. It is important to view enforcement as one tool available to achieve compliance. Enforcement in and of itself is not a goal – compliance is the goal.

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 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 Onsite Sewage Disposal Systems (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 storm water systems according to their Storm Water Pollution Preventive Initiatives (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 storm water drainage system. The potential for seepage from sanitary sewers into the storm water 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 Storm Water Program Manager will be notified and initial information will be gathered. Records will be maintained regarding the incident from the first report to resolution. Figure 3 provides an Example Community IDEP Log. 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 Storm Water 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 Pollution Emergency Alerting System (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, N.E. 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 Dr. 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 Rd Wyoming, MI 49519 (616) 784-8900 Fax: (616) 534-5782 http://kdigroup.com/	Valley City Environmental Service 1040 Market Ave. SW Grand Rapids, MI (616) 235-1500 Fax (616) 235-9507 24hr 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 PREVENTIVE MEASURES

Mechanisms have been put in place to prevent future illicit discharges and connections. Each community has strategies for prevention of new illicit discharges. Examples of preventive measures are:

- Provide and advertise the availability of recreational vehicle sewage disposal
- Programs to eliminate SSOs
- Planning and permitting procedures for new development or redevelopment
- Inspection procedures for new development or redevelopment
- Continuation of Public Education Plan activities addressing the prevention of illicit discharges

10.0 DOCUMENTATION AND REPORTING

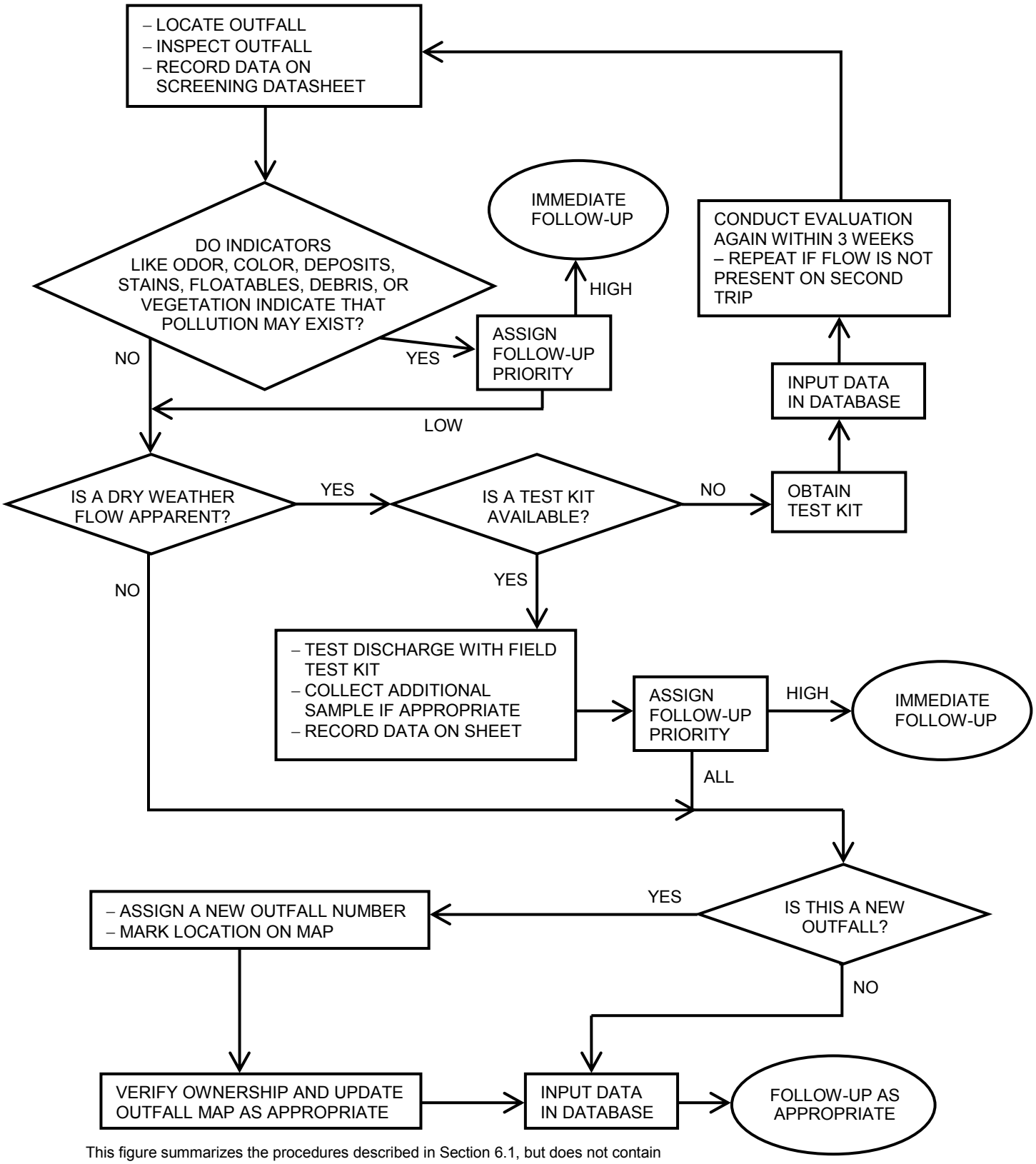
Progress Reports will be submitted to the MDEQ on the implementation status of the IDEP. The report will cover all of the decisions, actions, and results performed as part of the IDEP during the previous reporting period. The progress report will include:

- 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 onsite sewage disposal systems 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

DRY-WEATHER OUTFALL EVALUATION FLOWCHART



This figure summarizes the procedures described in Section 6.1, but does not contain every detail of the procedure.

Figure 1

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IDEP DRY WEATHER SCREENING DATA SHEET

FIGH

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

EXAMPLE COMMUNITY IDEP LOG

Computer Version

ITEM	DATE	DATA / DESCRIPTION	Person Entering Data
INCIDENT NUMBER ________________			
Initial Report Description			
Person Assigned to follow up			
Initial Follow-up Report			
Subsequent Follow-up Report (Repeat as necessary)			
Final Resolution			
Resolution Verified			
INCIDENT NUMBER ________________			
Initial Report Description			
Person Assigned to follow up			
Initial Follow-up Report			
Subsequent Follow-up Report (Repeat as necessary)			
Final Resolution			
Resolution Verified			
INCIDENT NUMBER ________________			
Initial Report Description			
Person Assigned to follow up			
Initial Follow-up Report			
Subsequent Follow-up Report (Repeat as necessary)			
Final Resolution			
Resolution Verified			

Figure 3

EXAMPLE COMMUNITY IDEP LOG

Paper Version

ITEM	DATE	DATA / DESCRIPTION	Person Entering Data
INCIDENT NUMBER _____			
Initial Report Description			
Person Assigned to follow up			
Initial Follow-up Report			
Subsequent Follow-up Report (Repeat as necessary)			
Final Resolution			
Resolution Verified			

Figure 3

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
October 2004

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

CASCADE CHARTER TOWNSHIP
KENT COUNTY, MICHIGAN
Discharge Point Identification
3-May-13

ID	LOCATION	RECEIVING WATER	TYPE	LAT	LONG	PRIORITIZATION
CST15DP1	Cascade Township Fire House	Butterick Avenue Road Ditch	MS4-MS4	42.9104	-85.4702	Medium Low
CST1603	Leslie E. Tassell Park overlook	Thornapple River	Water of the State	42.9104	-85.4984	Medium High
CST1636	Leslie E. Tassell Park south parking	Thornapple River	Water of the State	42.9100	-85.4989	Medium High
CST1637	Leslie E. Tassell Park south parking	Thornapple River	Water of the State	42.9113	-85.4973	Medium High
CST16DP1	Cascade Library	28th Street Road Ditch	MS4-MS4	42.9131	-85.5048	Medium Low
CST16DP2	Cascade Township Hall north	Thornhills Avenue Road Ditch	MS4-MS4	42.9112	-85.5081	Medium Low
CST16DP3	Cascade Township Hall south	Thornhills Avenue Road Ditch	MS4-MS4	42.9107	-85.5082	Medium Low

Cascade Township Outfalls and Discharge Points