

Attachment 2

To MDEQ Stormwater Discharge Permit Application

(IDEP Plan)

(IDEP Protocol Manual)

(Individual Community Enforcement Authority)

(Illicit Discharge Ordinance/ Regulatory Mechanism)

(IDEP Ordinance Schedule)

ILLICIT DISCHARGE ELIMINATION PLAN (IDEP) 2014 Application

Submitted in partial fulfillment of the State of Michigan National Pollutant Discharge Elimination System Permit Application for Coverage of Storm Water Discharges by:

GENESEE COUNTY PHASE II PARTICIPANTS

Phase II Permittees:

Burton; Clio; Davison; Davison Township; Fenton; Fenton Township; Flint Township; Flushing; Genesee Township; Grand Blanc; Linden; Mount Morris; Mount Morris Township; Swartz Creek; Vienna Township; Genesee County.

Nested Jurisdictions under Genesee County Permit:

Atherton Community Schools	Fenton Area School	Lake Fenton Schools
Beecher Community Schools	Flint Board of Educations	Linden Community School
Bendle Public Schools	Flushing Community Schools	Mt. Morris Consolidated Schools
Bentley Community Schools	Genesee Schools District	Swartz Creek Community Schools
Carman Ainsworth Community Schools	Genesee Intermediate School District	Westwood Heights Schools
Clio Area Schools	Grand Blanc Community Schools	
Davison Community Schools	Kearsley Community Schools	Bishop Airport*

The Bishop Airport property is nested under Genesee County's permit for their storm water runoff only. They also have an industrial discharge permit for their other activities.

The Municipal Separate Storm Water Discharge Permit requires that all MS4s develop an illicit discharge elimination plan (IDEP). The above communities have entered into a 342 agreement with the Genesee County Drain Commissioner's office (GCDC) to assist them with their stormwater needs. As part of the contracted agreement the GCDC will be conducting the IDEP activities required by the permit on behalf of the communities and nested jurisdictions. This plan is submitted on behalf of all of the above communities and nested jurisdictions. It outlines the approach to be used to meet their IDEP obligations. The major components of the Genesee County IDEP plan include field verification of outfall locations, reviewing and eliminating illicit discharges, reviewing the legal authority, minimizing seepage from septic systems and sanitary sewers, and the coordination of activities.

Reviewing the Legal Authority

Legal authority for the management & elimination of illicit connections and discharges stems from two state authorities. The first is the Michigan National Pollutant Discharge Elimination System (NPDES) permit (MIG60000) which enables local communities to grant themselves the authority to regulate, prohibit, investigate, monitor and enforce illicit connects and discharges. The 342 permitted communities

have been provided with an ordinance template that addresses each of these requirements that they can tailor to their own situation and then adopt it into their local code. Individual permittee legal authority is under a **separate document**.

The second legal authority stems from the Michigan Drain Code of 1956, Section 280.423, which grants the Genesee County Drain Commissioner (GCDC) the authority to prohibit illicit discharges. This authority applies to all legally established county drains. The relevant section from the Michigan Drain Code is attached.

The third legal authority is the Genesee County Health Department (GCHD), which governs septic systems only.

The fourth legal authority stems from PA 283 of 1909, section 19b. which requires a person, partnership, association, corporation or governmental entity to acquire a Permit for work within a county road from its Road Commission. Work would include connecting storm water outlets within the Road ROW. The relevant section is attached.

The GCDC together with local community representatives has reviewed the current legal authority and enforcement procedures. The County storm water ordinance template will provide local municipalities with the authority (once adopted) to prohibit illicit discharges and manage outfalls for all municipal drainage systems. Attachment "C" is the section out of the template ordinance that covers legal authority to prohibit illicit discharges.

The BMP subcommittee has been working on developing the Stormwater Ordinance, which includes the authority to detect and eliminate illicit connections and discharges to the permittee's MS4. Pursuant the COCs, the Stormwater Ordinance Template was submitted to the MDEQ for review under the revoked 2008 permit. The following schedule will be followed for adoption of the ordinance:

Aug 11, 2010: Meet with MDEQ, to go over comments and concerns.

October 11, 2010: make necessary changes and submit copy to MDEQ.

March 8, 2011: MDEQ withdrew 2008 permit

2014* required communities to adopt ordinance.

Field Verification of Outfall Locations

The outfall map section of this plan is based on field investigation conducted in the previous permit cycle together with permittee records. Although a majority of the collection systems was surveyed in the first permit cycle not all outfalls have been field verified. The IDEP plan approved under the previous permit used a different approach to locate and field verify outfalls. The IDEP crews walked the waters of the state within Genesee County and located all outfalls whether they were MS4's or private. With the 2008-2013 permit cycle, only MS4's are being identified. The outfalls that are being identified and screened are all MS4s where they are going from permittee jurisdiction into the waters of the state and discharge points between two permittee MS4 jurisdictions. **Note: Genesee County's permit covers several agencies and nested jurisdictions. A single outfall identified under the County's permit may contain multiple discharge points between agencies or nested jurisdictions covered under the same permit.** An important part of this cycles IDEP work will be to continue to field verify the location of mapped outfalls. Additionally, ownership (municipal MS4 or private) will be determined for each outfall. Maps are being continually updated, but are available in a shapefile version (GIS). Electronic copies are available and were provided to the MDEQ upon request in 2010 and an updated version November 2011. Yearly outfall updates are prepared and submitted within the progress report.

All known outfalls and discharge points for each community (except Burton and Genesee County) have been identified. Genesee County's agencies and nested jurisdictions combined have more than 1,500 categorical discharges that are being identified. City of Burton took over the roads from the Genesee County Road Commission in the last 10-years. This has provided a significant larger number of outfalls under the City of Burton's jurisdiction than originally anticipated. Identification of the outfalls for Burton Roads has been complicated by not all roads having maps.

All outfalls identified as of April 1, 2014 are located in attachment 1. If all outfalls are not identified a plan is included on how they will be identified prior to Oct 1, 2014. A shape file of the outfalls and storm systems are available. As outfalls are added/ removed, specific location(s) for additional outfall(s) will be reported as needed. Changes will be reflected in an updated map to be included in the progress reports.

Prioritizing Areas for Dry Weather Flow

Areas to be dry weather flow tested first are prioritized based on the permit application (page 5) and other criteria listed below. Before Oct 1, 2014 all known outfalls will be evaluated based on the criteria below be ranked as high, medium or low priority and the basis for that ranking. Dry weather testing will be done based on the schedule below and geography to maximize resources and to reduce travel time, proximity of outfalls to one another will be taken into consideration. Copies of the updated outfalls with the priorities will be available to the State upon request.

NOTE: Individual Permittees that opt to follow a alternative procedure for dry weather testing will need to provide to the State their procedure that would supersede this one.

High Priority

- Areas with older infrastructure
- Industrial, commercial, or mixed use areas
- Areas with a history of past illicit discharges
- Areas with a history of illegal dumping
- Areas with onsite sewage disposal systems
- Areas with older sewer lines or with a history of sewer overflows or cross-connections
- Areas with poor dry-weather water quality
- *Areas with water quality impacts, including waterbodies identified in a Total Maximum Daily Load
- Verification of Categorical Outfalls (previously unmapped ?& never tested)
- Discharge complaints and reports

Medium priority

- Other potential pollutant generating sites
- Type of commercial activity
- Areas with sewer conversions or historic combined sewer systems

Low priority

- Undeveloped area
- Subdivisions less than 30 years old with no know history of illicit discharge
- Confirmed illicit discharge that has been removed
- Upstream Discharge points that are already being sampled at the outfall regardless of jurisdiction unless a suspected illicit discharge is found

*The only TMDL in Genesee County is for ecoli. The outfall would only be considered high priority under this choice if it had the potential of discharging ecoli.

Schedule: Points of Discharge to be dry weather tested

2015	High priority outfalls for Municipalities 60% complete, Genesee Co 10% complete
2016	High priority outfalls for Municipalities 95% complete, Genesee Co 25% complete
2017	High priority outfalls for Municipalities 100% complete, Genesee Co 50% complete Medium priority outfalls for Municipalities 50% complete, Genesee Co. 10% comp
2018	High priority outfalls for Genesee Co 75% complete Medium priority outfalls for Municipalities 100%, Genesee Co. 60%
2019	High priority outfalls for Genesee Co 100% complete Medium priority outfalls for Genesee Co. 100%
	Low priority outfalls will be done in 2020-2025 permit cycle

Although ok the outfalls will be completed at the end of the 5-year IDEP cycle the year-to-year schedule is subject to adjustments due to weather, financial considerations and staff availability.

***Prior to October 1, 2014 a list showing the priority level of each outfall will be provided to the State.**

Performing Dry-weather Screening

As mentioned above, one of the primary actions under the IDEP program is to identify and remove all illicit discharges and connections from the municipal storm sewer system. The outfall maps presented in Attachment 1 of the 2014 application is in ArcView GIS and this information will be updated and added to for guiding the screening of outfalls for dry weather flow.

To achieve IDEP requirements, each outfall that is prioritized High or Medium will be screened for signs of illicit discharges. Where illicit discharges are suspected, systematic investigation upstream of the outfall will be conducted to trace the discharge to the source where practicable.

*Genesee County outfalls include all County agency and nested jurisdiction outfalls. A single outfall identified under the County's permit may contain multiple discharge points between agencies or nested jurisdictions covered under the same permit. Only the County agency/ nested jurisdiction at the point of outlet will be indicated on the outfall table. The PA 342 Contract acts as a interagency agreement.

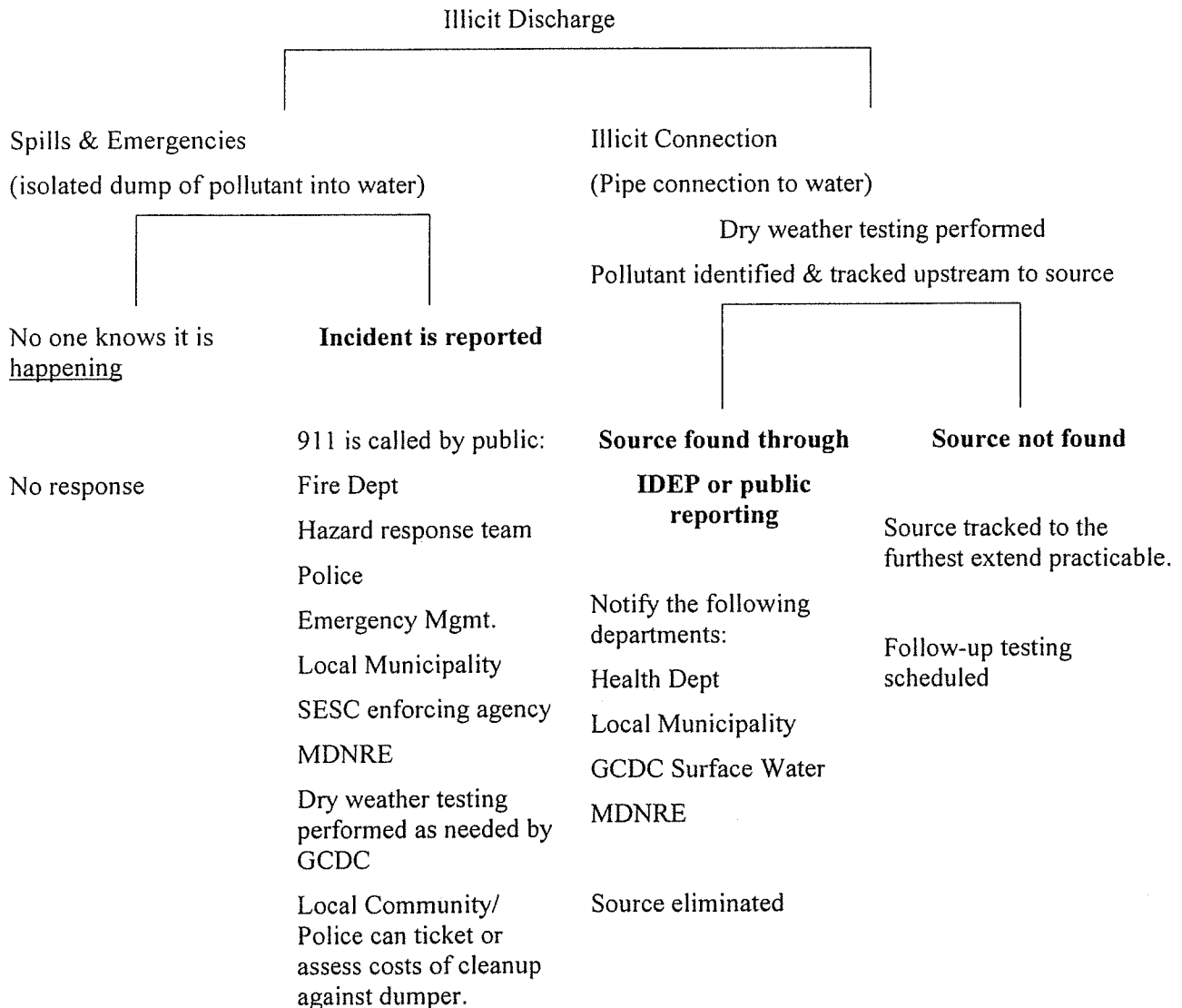
The process of locating and removing illicit connections is illustrated in an attached Work Plan Flow Chart. The flow chart is discussed in detail below. Forms for recording field inventory information and observations if dry weather flow is observed are also included at the end of this section. The dry weather screening form could be used multiple times at a single site if a suspected connection or discharge requires follow-up site visits.

The High or Medium outfall will be observed in the field during dry weather conditions, 72 hours with less than 0.10 inches of rainfall, and the sites will be checked for intermittent flows if suspected. If flow is present, it will be visually observed, checked for odors, and tested for representative tracer parameters such as pH, temperature, E. coli, fecal coliform, detergents, ammonia, and total organic carbon. The thresholds for the above parameters that trigger activity to determine the sources of illicit connections are listed below. All of these tests, except for pH and temperature, will be performed by a professional contract laboratory. Test results and observations will be used to identify areas that require follow-up investigations.

Parameter	Threshold
Ammonia (NH ₃)	1 mg/l
Surfactant	.2 mg/l
E.coli.	2000 Col. Per 100 ml
Ph	7 - 9

Decision Making

Depending upon the type of illicit discharge there are various responses that can occur. The following chart outlines the appropriate responses to an illicit discharge based upon whether they are spills and emergencies or illicit connection.



Depending on the type and location of an illicit discharge, the responsible party can change. In a spill or emergency, 911 should be called to initiate the emergency response. As an illicit discharge is identified and information is gathered, the responsible party will be identified from the above bulleted list.

The following are examples of the types of materials that if discharged constitute a spill or an emergency due to the potential introduction of pollutants to local waterways either directly or through stormwater: dredged spoils, solid waste (see below), sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat sources, wrecked or discarded equipment, rock, sand,

petroleum products, industrial, municipal, and agricultural waste. This list is not meant to be exhaustive. The quantity of the spill should also be considered in conjunction with the type of spill that has occurred before reporting it. For example, wastewater from painting activities need not be reported to 911 but one may wish to mention it to the authorities such as public works, or the GCDC to have them contact the offender in order to educate them.

Illegal dumping: permittee will make sure 911 has been contacted, who will contact fire dept, police, emergency management and the hazardous response team. Local responder will depend on the nature of the discharge (see above) and if a responsible party is identified. If a responsible party is identified, a private cleanup company may be involved. MS4 owner is enforcement agency for follow up. (local municipality, County, MDNRE).

Illicit sanitary connection: once identified, GCDC will contact the Health Dept, local community, MS4 owner and MDNRE by letter. Enforcement agency for follow up is Health Dept, coordinated with GCDC.

Failing soil erosion measures: MS4 owners are the enforcement agency once construction is complete and the soil erosion permit has been released. If the site is a current construction site, the permittee will make sure the presiding SESC agency has been notified pursuant section 9107 of Part 91 and fill out a spill form. If there is an active SESC permit then the presiding SESC agency is the enforcement agency.

Large quantity spill: permittee will make sure 911 has been contacted, who will contact fire dept, police, emergency management and the hazardous response team. Local responder will depend on the nature of the discharge and if a responsible party is identified. If a responsible party is identified, a private cleanup company may be involved. MS4 owner is enforcement agency for follow up. (local municipality, County, MDNRE).

In all the above instances, if a responsible party is not identified, and if the spill is significant enough to warrant clean-up, measures will be taken to address the problem by local authorities to levels that at a minimum ensure public safety. The decision to commence with a clean-up will be made by whoever has jurisdiction over the spill site. In some cases there maybe multiple jurisdictions in which case all parties will be consulted on the course of action to occur. For all significant spills, the MDEQ will receive verbal notification of the event within twenty-four (24) hours.

Within Individual communities, if an emergency spill is received, this person will make sure that the call gets resolved or forwarded to the responsible agency.

- | | |
|------------------------|-------------------------------|
| • Davison Township | DPW Director |
| • Fenton Township | Ordinance Enforcement Officer |
| • Flint Township | Building Dept Agent |
| • Genesee Township | Code Enforcement Officer |
| • Mt. Morris Township | Code Enforcement Officer |
| • Vienna Township | Code Enforcement Officer |
| • City of Burton | DPW Director |
| • City of Clio | City Administrator |
| • City of Davison | Clerk/DPW |
| • City of Fenton | DPW Director |
| • City of Flushing | DPW Supervisor |
| • City of Grand Blanc | Public Works Director |
| • City of Linden | DPW Director |
| • City of Mt. Morris | DPW Superintendent |
| • City of Swartz Creek | DPW Director |
| • Genesee County | GCDC-SWM Drain Engineer |

Illicit Source Identification

GCDC-SWM has been contracted to coordinate the dry weather testing and perform any follow up on behalf of the Contracted Phase II communities and nested jurisdictions listed on the first page of this document. When initial testing has identified a potential problem, it will be given to the GCDC office staff to follow up and confirm an illicit connection or not. The land use and type of buildings in the area will be considered to determine the next course of action. Based on the land use and the results of the observations and chemical testing, additional manholes will be investigated. Tracing of the pollutant stream will continue by manhole investigations until the source is isolated within a relatively short reach of sewer. Dye testing of building fixtures will then be used to locate the source.

Dye testing will be scheduled by GCDC staff at individual buildings following notification of the building owner to explain the need for this investigation and how it will be performed. In general, dye testing will be used as the final step to gain positive identification of an illicit connection. Televising the sewer may be used to further isolate the pollutant source or may be used if dye testing does not reveal the source of the problem. This approach is intended to locate illicit connections in the most cost-effective and efficient manner possible. It will focus the use of dye testing in those areas with the highest potential for illicit connections.

Field investigations to identify specific illicit connection locations will be performed by either the GCDC or a consultant contract. If a source is found discharging to a municipal's or nested jurisdiction's MS4 that is not owned by Genesee County, GCDC will also notify owner, elected official (supervisor, mayor or superintendent) or in the case of the airport the facilities manager for assistance to perform the tracking and elimination of the illicit discharge. If a source is found discharging to a Genesee County MS4, GCDC will also notify the appropriate agency(ies) for assistance to perform the tracking and elimination of the illicit discharge.

Illicit discharges to MS4 systems other than the County's, 342 communities and nested jurisdictions that are discovered will result in the generation of a letter to the owner/operator informing them of the problem. If it is a confirmed illicit discharge the MDEQ will be copied on the letter.

Occasionally, hot spots are located that may threaten local water quality. Stormwater hot spots are areas where current or legacy land uses or activities generate contaminated runoff, with concentrations of pollutants exceeding those typically found in stormwater. A typical example is an abandoned underground storage tank associated with a gas station. If a suspected hot spot comes to the attention of GCDC they will develop a plan to monitor the hot spot and the surrounding area, within their capacity, to determine the degree and extent of the problem and the threat (if any) it may pose to local waterways and public health. Appropriate action will then be taken as limited by the availability of funds.

When potential illicit connections are located, the GCDC will be provided with specific details by the consultant/ field investigator. The GCDC will be responsible for coordinating the tracking of an illicit connection upstream to its source and elimination. Once an illicit connection has been confirmed a letter to notify the property owner / responsible party and other involved parties (including the municipality, MS4 owner and the MDEQ) of the violation and require corrective action by the property owner or responsible party. If the illicit connection is time sensitive or beyond the jurisdiction of this program (such as an industrial discharge), an e-mail may be sent in lieu of a letter. Once the confirmed illicit connection has been eliminated a follow-up letter will be sent to all involved parties.

Eliminating Illicit Discharges and Pursuing Enforcement Action

Prioritization of verifying and removing potential illicit connection is done through a combination of when they are initially detected (chronologically) and by geographical location (trying to maximize resources through scheduling investigation that are close to each other). If the property owner does not respond in the specified time frame, follow-up enforcement action will be taken by GCDC or the appropriate enforcing agency. Each problem is unique and depending upon the circumstance. When the property owner or responsible party has indicated that a connection has been eliminated, GCDC will confirm that all problems have been fixed to their satisfaction for both the County Departments, nested jurisdictions and 342 communities.

GCDC and its partners will work to eliminate all illicit discharges to the maximum extent practicable. This means exhaustive steps will be taken within the limits of financial and technical resources available to address the problem. Occasionally, elimination of the source is not possible either because it cannot be found or the cost to address the problem exceeds the benefits of making the correction. In these cases either a management plan will be implemented and/or the location identified for regular monitoring by the owner/operator.

Updated maps are provided in the progress reports that reflect ownership, status of any illicit connections found, as well as corrections to the original information in the permit.

Public Notification System for Illicit Discharges

Currently the Illicit Discharge system is split between those that are associated with illegal dumping and those releases associated with MS4s. The above flow chart illustrates the various paths and responsible parties involved in managing Illicit Discharges.

The number of possible ways that an illegal dumping can occur compounded by the number of agencies involved make centralization of this function extremely difficult and cost prohibitive under the current economic climate. Furthermore, centralization of the function may in-fact reduce response time and clean up efficiency due to having to educate the public about the who they should call. Current laws do not provide for a single responsible party.

The permit requires the permittee to develop and implement a procedure for the receipt and consideration of complaints or other information submitted by the public regarding construction activities discharging waste to the MS4.

The M&M Subcommittee had already created a form to be used to track illegal dumping as reported by the public, similar in concept to a "chain of custody" from used to track hazardous materials. The form originates with the agency that receives the call from the public and end with GCDC. This way illegal dumping calls will be responded to as they are received. Calls will continue to be prioritized by the type of suspected release. For example, from the responder's perspective a suspected oil spill will take precedent over a suspected detergent spills. Another benefit to improving the current system is that it allows local communities under current laws to levy fines and collect clean-up costs if the responsible party can be identified.

The illicit dumping form will direct the originating agency to notify GCDC within 24 to 48 hours and inform them of any corrective action taken. This way GCDC can track any open notification that still may need to be followed up on as well as determine any apparent patterns that may lead to eliminating re-occurrences in the future.

The permit requires the permittee to develop and implement a procedure to provide notice to the part 91 permitting entity and the Department when pollutants are discharged in violation of section 9116 of Part

91 (SESC rules). The requirement of notice of violation has already been required in section 9107 of Part 91. A new procedure is unnecessary.

Note: minor changes to the spill form have been done to include SESC information to notify of SESC complaints.

Minimizing Seepage from Septic Systems and Sanitary Sewers

A map of the sanitary sewer service areas was prepared in 2006 for the watershed plan to define areas where sanitary service is available and septic tanks can be prohibited. Those areas with possible septic tanks are included in the watershed management plans. As part of the actions in the Watershed Management Plan, Genesee County will explore the possibility for a time of sale septic tank inspection ordinance and coordinate such activities with the County Public Health Department.

GCDC Water and Waste Services (WWS) has a PA 342 Water and Sewer Advisory Board (WSAB) with their water and sewer community customers. The WSAB have a sanitary sewer infiltration and inflow removal program (I&I Program). This program is being enforced by both GCDC-WWS and the local communities that use the WWS treatment plants. Since 2001 there has been a significant effort to reduce I&I through monitoring flows between communities, lining sanitary lines, locking sanitary lids, waterproofing structures, footing drain removal and other efforts by all parties. This has resulted in a wet weather reduction to the treatment plants. There has also been a reduction on sanitary sewer overflows due to wet weather. WWS has also focused on efforts to the infrastructure and treatment plants to build in non-wet weather capacity.

Training

At the start of every IDEP field season training is conducted for new Tetra Tech employees, summer interns, GCDC personnel and individuals from various other firms and municipalities. The training is typically for an entire day and provides procedural information for individuals that have not previously been involved in IDEP operations, and it serves as a refresher for the regular IDEP field crews. There is both an in-class module and a field demonstration. Through the use of Power Point presentations, IDEP protocol manuals, and hands on training in the field, individuals are given the tools to collect and record the required data under the Phase II Storm Water permit.

At a minimum the following topics are covered:

The definition of illicit discharges and connections

Techniques for finding illicit discharges, including field screening, source identification, and recognizing illicit discharges and connections

Methods for eliminating illicit discharges and the proper enforcement response

A training schedule and requirement for training during the term of the permit

Additional topics usually include:

The methodology that will be utilized by the municipality to find, prioritize and eliminate illicit discharges and connections to the municipal separate storm sewer system (MS4)

The IDEP investigation history for the municipality

Desktop assessment of illicit discharge potential within the municipality, including assessment of the highest priority investigation areas based on the prioritization criteria listed in Table 1 of the permits

Investigation planning and preparation for field work

Field techniques that can be used to detect and identify the sources of illicit discharges/connections.

Record Keeping

Permittees shall make records associated with IDEP activities to address illicit discharges and connections available to the MNRE upon request.

DRAINAGE SYSTEM INVENTORY

GENERAL

ID

Date _____

Time _____

Crew Initials _____

Chk By: _____

Photographs: Roll # _____ Picture #'s _____

DISCHARGE STRUCTURE TYPE

- ☐ PSD
- ☐ Manhole
- ☐ Catch Basin
- ☐ Culvert Outlet
- ☐ Point in Open Channel
- ☐ Abandoned
- ☐ Unknown

PSD Status

- ☐ PSD
- ☐ Not a PSD
- ☐ PSD Not in Permit (New)
- ☐ PSD Not Permittable
- ☐ Structure within Drainage Network

LOCATION (see back side for location sketch)

Latitude

Longitude

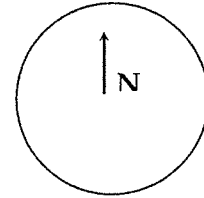
Invert Elevation

Offset Description:

Receiving Waterbody: _____

DISCHARGE STRUCTURE INFORMATION

Pipe ID						
Direction from MH						
Shape						
Diameter (in)						
Width (in) (Open Channel)						
Depth (in)						
Measure Down (ft) (Manhole)						
Invert Elevation (ft) (Pipes)						
Conduit Material						
US/DS End						



Comments

LOCATION SKETCH

LOCATION SKETCH CHECK LIST

Label Street Names

Indicate North

Locate manholes by dimensions from property lines, back of curb, or edge of pavement

Sketch catch basins and connections (no measurements necessary).

Indicate (if possible) distance to upstream and downstream manholes

Landmarks/nearest address, if any

Flow direction

Sample point

Special access/traffic control notes

Between mile markers _____ & _____ or _____ tenths past mile marker _____

Velocity/depth measure location

DRAINAGE SYSTEM SCREENING

GENERAL

ID

Date

Time

Air Temp

Rain ☐ Yes ☐ No

☐ Clear/Sunny

Crew Initials

Chk By:

☐ Partly Cloudy

Photographs: Roll # Picture #

☐ Overcast

DRY WEATHER FLOW PRESENT

☐ Yes, Dry Weather Flow Present

☐ Trace, Insufficient

☐ No Dry Weather Flow Present

☐ Standing Water

☐ Submerge

☐ Inundated

☐ N/A

FLOW MEASUREMENTS

Pipe Sampled: Size (in) Direction

Method: ☐ Tt Method

General Data

Travel

☐ Area * Velocity

Depth, (in)

Time Trials

☐ Bucket

Dist Traveled, (ft)

#1 (sec)

☐ Manning's

Bucket Vol, (l)

#2 (sec)

Channel Slope
(%)

#3 (sec)

Channel Material

Avg (sec)

Flow:

Channel, n

Vel (fps)

Intermittent ☐ Not Checked

Flow Check ☐ Left Sand Bag in Channel

☐ Removed Sand Bag, intermittent DWF present ☐ Yes ☐ No

if possible describe frequency, duration, time of day of flow slugs – put in comments section

DISCHARGE OBSERVATIONS (if “other” checked fill in description at bottom of page)

Odor	<input type="checkbox"/> None	<input type="checkbox"/> Musty	<input type="checkbox"/> Sewage	<input type="checkbox"/> Rotten Egg	<input type="checkbox"/> Gas	<input type="checkbox"/> Oil	<input type="checkbox"/> Other
Floatables	<input type="checkbox"/> None	<input type="checkbox"/> Trash	<input type="checkbox"/> Sewage	<input type="checkbox"/> Bacterial Sheen	<input type="checkbox"/> Oil Sheen	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Deposits/ Stains	<input type="checkbox"/> None	<input type="checkbox"/> Mineral	<input type="checkbox"/> Sediment	<input type="checkbox"/> Oily	<input type="checkbox"/> Grease	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Vegetation	<input type="checkbox"/> None	<input type="checkbox"/> Normal	<input type="checkbox"/> Excessive	<input type="checkbox"/> Algae	<input type="checkbox"/> Slime		<input type="checkbox"/> Other
Structural	<input type="checkbox"/> Normal	<input type="checkbox"/> Cracking	<input type="checkbox"/> Spalling	<input type="checkbox"/> Corrosion	<input type="checkbox"/> Settlement	<input type="checkbox"/> Staining	<input type="checkbox"/> Other
Color	_____	Enter #					
	—						
Turbidity	_____	Enter #					
	—						

Description:

RECEIVING WATER OBSERVATIONS (if "other" checked fill in description at bottom of page)

Odor	<input type="checkbox"/> None	<input type="checkbox"/> Musty	<input type="checkbox"/> Sewage	<input type="checkbox"/> Rotten Egg	<input type="checkbox"/> Gas	<input type="checkbox"/> Oil	<input type="checkbox"/> Other
Floatables	<input type="checkbox"/> None	<input type="checkbox"/> Trash	<input type="checkbox"/> Sewage	<input type="checkbox"/> Bacterial Sheen	<input type="checkbox"/> Oil Sheen	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Deposits/ Stains	<input type="checkbox"/> None	<input type="checkbox"/> Mineral	<input type="checkbox"/> Sediment	<input type="checkbox"/> Oily	<input type="checkbox"/> Grease	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Vegetation	<input type="checkbox"/> None	<input type="checkbox"/> Normal	<input type="checkbox"/> Excessive	<input type="checkbox"/> Algae	<input type="checkbox"/> Slime		<input type="checkbox"/> Other
Bank	<input type="checkbox"/> Excessive Vegetation	<input type="checkbox"/> Staining of Banks	<input type="checkbox"/> Erosion	<input type="checkbox"/> Trash			<input type="checkbox"/> Other
Color	_____	Enter #					
Turbidity	_____	Enter #					

Description:

DRAINAGE SYSTEM SCREENING (Continued)

ID

CHEMICAL ANALYSIS

FIELD ANALYSIS LAB SAMPLE COLLECTED ID _____

Surfactants	_____ mg/L	Temperature	_____
Ammonia	_____ mg/L	pH	_____
Boron	_____ mg/L	Specific Cond.	_____
Potassium	_____ mg/L		
E. Coli	_____ per 100ml		

RESULTS

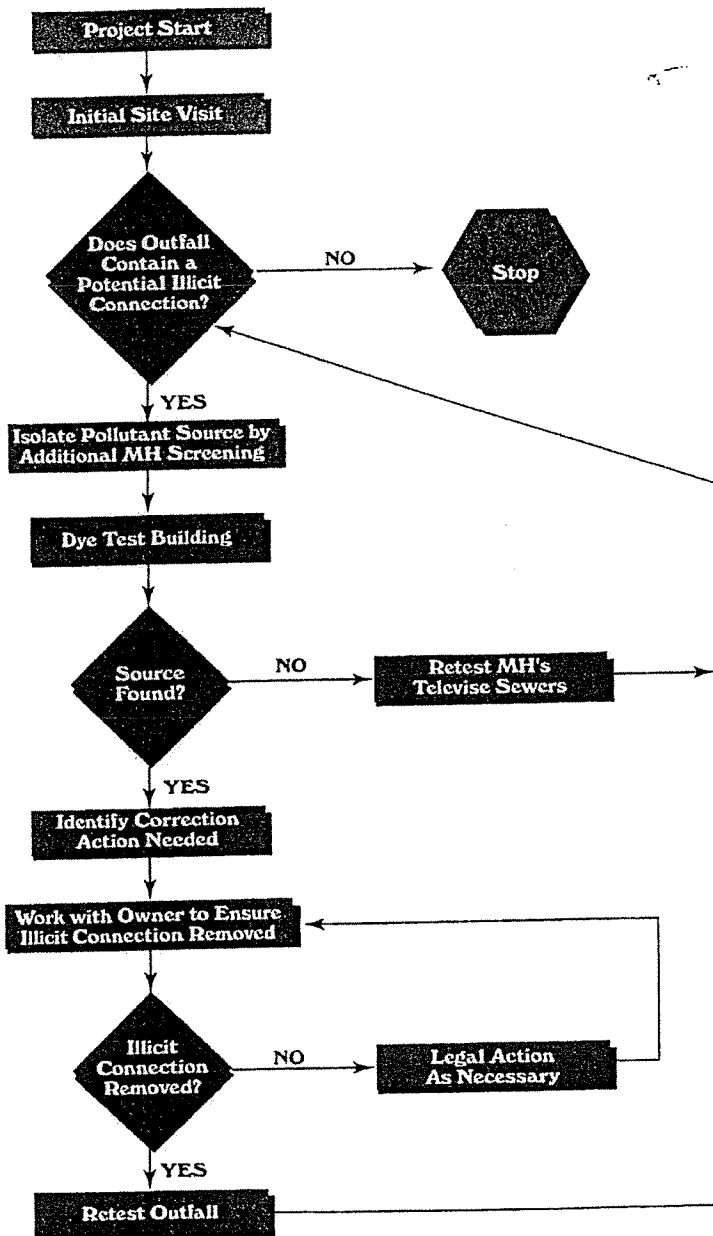
- ☐ Illicit Connection Ruled Out
- ☐ Illicit Connection (undocumented connection)
- ☐ Pending
- ☐ Notify City
- ☐ Not a PSD

ACTION

- ☐ None Required
- ☐ Illicit Removed
- ☐ Waiting on Lab Results
- ☐ Dye Test
- ☐ Televisé
- ☐ Investigate Further
- ☐ Illicit Connection

Comments

Illicit Discharge Elimination Program Work Plan Flow Chart



Michigan Drain Cod5 eff. 1956

Attachment "A"	Drain Code excerpt
Attachment "B"	PA283 of 1909 excerpt
Attachment "C"	*How to spot Illicit Discharge Brochure
Attachment "D"	(Left Blank)
Attachment "E"	Spill Notification

Attachment "A"
DRAIN CODE

280.423 Discharge of certain sewage or waste matter into drains prohibited; construction to purify flow; petitions; order of determination; findings; construction of drain; plans and specifications; contracts; costs; review; acquisition of land; application and fee for sewer connections; connections; powers of drain commissioner or drain board; failure to comply with section; violation as misdemeanor; fine; "person" defined.

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. This section does not prohibit the conveyance of sewage or other waste through drains or sewers that will not produce these injuries and that comply with section 3112 of part 31 (water resources protection) of the natural resources and environmental protection act, Act No. 451 of the Public Acts of 1994, being section 324.3112 of the Michigan Compiled Laws.

(2) Disposal plants, filtration beds, and other mechanical devices to properly purify the flow of any drain may be constructed as a part of any established drain, and the cost of construction shall be paid for in the same manner as provided for in this act for other drainage costs. Plants, beds, or devices may be described in the petition for the location, establishment and construction of drains or in the petition for the cleaning, widening, deepening, straightening, or extending of drains, or in the application for the laying out of a drainage district. Petitions for the construction of plants, beds, and devices for use on any established drain may be filed by the same persons and shall be received and all proceedings on the petitions in the same manner as other petitions for any drainage construction under this act.

(3) If the department of environmental quality determines that sewage or wastes carried by any county or intercounty drain constitutes unlawful discharge as prescribed by section 3109 or 3112 of part 31 of Act No. 451 of the Public Acts of 1994, being sections 324.3109 and 324.3112 of the Michigan Compiled Laws, that 1 or more users of the drain are responsible for the discharge of sewage or other wastes into the drain, and that the cleaning out of the drain or the construction of disposal plants, filtration beds, or other mechanical devices to purify the flow of the drain is necessary, the department of environmental quality may issue to the drain commissioner an order of determination identifying such users and pollutants, under section 3112 of Act No. 451 of the Public Acts of 1994, being section 324.3112 of the Michigan Compiled Laws. The order of determination constitutes a petition calling for the construction of disposal facilities or other appropriate measures by which the unlawful discharge may be abated or purified. The order of determination serving as a petition is in lieu of the determination of necessity by a drainage board pursuant to chapter 20 or 21 or section 122 or 192 or a determination of necessity by a board of determination pursuant to section 72 or 191, whichever is applicable. A copy of the findings of the department shall be attached to the order of determination which shall require no other signature than that of the director of the department of environmental quality. Upon receipt of the order of determination, the drain commissioner or the drainage board shall proceed as provided in this act to locate, establish, and construct a drain. If the responsible users of the drain are determined to be public corporations in the drainage district, the drain commissioner or the drainage board shall proceed as provided in chapters 20 and 21, as may be appropriate, using the order of determination as the final order of determination of the drainage board. If the responsible users are determined to be private Persons, the drain commissioner shall proceed as provided in chapters 8 and 9, using the order of determination as the first order of determination.

(4) Plans and specifications for the construction as part of a drain of any disposal plant, filtration bed, or other mechanical device to properly purify the flow of the drain shall be prepared by the drain commissioner or the drainage board. Contracts for construction shall be let in the manner provided in this

act. To meet the cost of any preliminary engineering studies for the construction of abatement or purification facilities, the drain commissioner or the drainage board shall apportion the cost among the several parcels of land, highways, and municipalities benefited thereby in the same manner as provided in chapter 7 or against the public corporations affected by the order of determination in the same manner as provided in chapters 20 and 21. The costs and charges for maintenance shall be apportioned and assessed each year. If the apportionment is the same as the last recorded apportionment, a day of review or a hearing on apportionments is not necessary, but if the apportionment is changed, notice of a day of review or a hearing on apportionment shall be given to each person whose percentage is raised.

(5) Land may be acquired as a site for the construction of such plants, beds, and devices, and releases of land may be obtained in the same manner as provided in this act for other lands acquired for right of way.

(6) A person shall not connect sewage or other waste to a county or intercounty drain except with the written approval of the appropriate commissioner or the drainage board indorsed upon a written application for such service and the payment of a service fee of not to exceed \$50.00 for each connection to a covered drain. The application shall include information showing that all other local, state, and federal approvals related to the sewage or waste have been obtained.

(7) The fee provided for in subsection (6) shall be set and collected by the drain commissioner, as approved by the county board of commissioners or the drainage board, and deposited with the county treasurer, to be credited to the drain fund set up for the maintenance or construction of the drain. The commissioner or the drainage board shall keep a record of applications made and the action on the applications. The commissioner or the drainage board may reject applications for or require such modification in requested applications for sewer connections to county drains as necessary to attain the objectives set forth in this section.

(8) Subject to the review and approval of the department of environmental quality, the drain commissioner or drainage board may study the requirements of persons for flood control or drainage projects including sewage disposal systems, storm sewers, sanitary sewers, combined sanitary and storm sewers, sewage treatment plants, and all other plants, works, instrumentalities, and properties useful in connection with the collection, treatment, and disposal of sewage and industrial wastes or agricultural wastes or run-off, to abate pollution or decrease the danger of flooding. The objective of such studies shall be that sewers, drains, and sewage disposal facilities are made available to persons situated within the territorial limits of any drainage district or proposed drainage district as necessary for the protection of public health and the promotion of the general welfare.

(9) The drainage board or drain commissioner may cooperate, negotiate, and enter into contracts with other governmental units and agencies or with any public or private corporation including the United States of America, and to take such steps and perform **such** acts and execute such documents as may be necessary to take advantage of any act of the congress of the United States which may make available funds for any of the purposes described in this section.

(10) Failure to comply with any of the provisions of this section subjects the offender to the penalties described in section 602. However, for each offense, a person who violates subsection (6) is guilty of a misdemeanor punishable by a fine of not more than \$25,000.00 or imprisonment for not more than 90 days, or both. In addition, the person may be required to pay the costs of prosecution and the costs of any emergency abatement measures taken to protect public health or the environment. Payment of a fine or costs under this subsection does not relieve a person of liability for damage to natural resources or for response activity costs under the natural resources and environmental protection act, Act No. 451 of the Public Acts of 1994, being sections 324.101 to 324.98106 of the Michigan Compiled Laws.

11) **As** used in this section, "person" means an individual, partnership, public or private corporation, association, governmental entity, or other legal entity.

History: 1956, Act 40, Imd. Eff. Mar. 28, 1956; --Am. 1972, Act 298, Imd. Eff. Dec. 14, 1972; --b. 1996, Act 60, Imd. Eff. Feb. 26, 1996; --Am. 1996, Act 552, Eff. Mar. 31, 1997.

Attach B

PUBLIC HIGHWAYS AND PRIVATE ROADS (EXCERPT)

Act 283 of 1989

(Act 212 of 1980)

224.19b Working within right-of-way of county road; permit required; exceptions; permit requirements and schedule of fees; itemization of costs; annual and emergency permits; security.

Sec. 19b.

(1) A person, partnership, association, corporation or governmental entity shall not construct, operate, maintain or remove a facility or perform any other work within the right of way of a county road except sidewalk installation and repair without first obtaining a permit from the county road commission having jurisdiction over the road and from the township, city or village in which the county road is located when a permit is required by ordinance of the township, city or village, pursuant to authority conferred by article VII, section 29 of the Michigan constitution of 1963. The adjacent property owner shall not be required to obtain a permit for work incidental to the maintenance of the right of way lying outside of the shoulder and roadway.

(2) A county road commission and a local unit of government may adopt after a public hearing of which notice has been given by publication at least twice in a newspaper circulated in the county not more than 30 days nor less than 7 days prior to the hearing, reasonable permit requirements and a schedule of fees to be charged sufficient to cover only the necessary and actual costs applied in a reasonable manner for the issuance of the permit and for review of the proposed activity, inspection and related expenses. After the work authorized in the permit has been completed, itemization of all costs shall be supplied upon request of the permit holder.

(3) When a road commission adopts procedures for the issuance of permits or adopts a schedule of fees in accordance with the provisions of this section, separate procedures and fee schedules shall be adopted for the issuance of annual and emergency permits which reflect the minimal administrative burden of issuing an annual permit for frequent but routine and unobtrusive work such as surveying and the extraordinary emergency repairs to municipal or public utilities.

(4) A county road commission may not refuse a permit requested by a government entity for the installation of a facility or utility owned by that entity if security is given by the permittee or its contractor to the county road commission sufficient to insure restoration of the road and appurtenances thereto and adjacent right of way to a condition reasonably equal to or better than that existing prior to such installation nor may a county road commission charge a government entity a permit fee exceeding \$300.00 per permit or \$1,000.00 total for all permits per project.

History: Add. 1980, Act 212, Eff. Mar. 31, 1981

Training for staff that have field jobs

For staff that do not actually perform Dry weather flow, but do work in field jobs that would have the potential for them to witness illicit discharges and connections, a information sheet is being developed. See Attachment C. This will be provided to appropriate staff per IDEP training and evaluation (#18) requirements in the 2014 application and can be used to train staff.

An information sheet on signs of an illicit discharge, see attachment – will be provided to staff per IDEP training and evaluation (#18) requirements in application. We will provide the training/literature on the following schedule:

The information in Attachment C of this document (How to spot an illicit discharge, a Tip Card) will be distributed to field staff within 1st year of employment and at least every 5 years.

Vienna Township Building Department will keep records.

Effectiveness of IDEP program

The current permit requires that the permittee determine the effectiveness of their illicit discharge elimination activities. These evaluation activities are in addition to inspecting each high and medium storm water point source every five years. GCDC will use three evaluation methods, all of which are approved methods in the MDEQ IDEP guidance. The current GCDC IDEP program will continue to compare the number of illicit discharges/connections eliminated versus the number found and report these in the annual report. The second evaluation method is to use the illicit discharge tracking form for public generated complaints. Information collected will be reported in the progress reports. The last evaluation method to be used is the ambient water quality monitoring results generated yearly from the existing program. Project Green, FRWC's Benthic Monitoring, monitoring conducted for IDEP investigation and any additional hot spot monitoring are updated and analyzed annual.

Progress Report

GCDC together with its member permittees will provide documentation of the actions taken to eliminate illicit discharges. For identified illicit discharges, the permittees shall summarize the total estimated volume and pollutant load eliminated for the main pollutants of concern, and the locations of the discharges into both the permittees MS4 and the receiving water.

Coordination of Activities

The Genesee County Drain Commissioner will be coordinating with all municipalities, county agencies and nested jurisdictions to address illicit connections/discharges, local ordinances, and seepage from septic systems and sanitary sewers. This work is proposed to be performed under a PA 342 contract with Genesee County. All work is proposed to be directed by the Drain Commissioner and coordinated with the Road Commission, Health Department, Emergency Management Services, and local officials, as appropriate. Annual discussions on IDEP matters will be placed on 342 committee of the whole meetings.

Attachment "C"









How to spot an Illicit Discharge Brochure:

This brochure is under development. It is modeled on the alliance of rouge communities IDEP Tip Card. (shown below) It may be used to train staff and can be made available to the public.

- What is an illicit discharge and how to identify
- Hazards associated with illegal discharges
- What to report
- Who to report to

Schedule: PEP subcommittee/ Tetra Tech will have brochure complete by July 1, 2014 for distribution.

What are the Signs of an Illicit Discharge?

Sanitary Sewer Discharges Observations <ul style="list-style-type: none"> • Sanitary odors • Standing on pipe • Road suds • Gray or discolored water • Odors, sewage, rotten eggs or detergents Contact IDEP coordinator and/or DPW	 	Failed Septic Systems Observations <ul style="list-style-type: none"> • Overgrown or wet patch of grass • Cheater pipe to ditch • Road suds • Gray or discolored water • Odors, sewage, rotten eggs or detergents Contact Health Department and/or IDEP coordinator	 
Illegal Dumping, Spills or Floor Drain Connections Observations <ul style="list-style-type: none"> • Oil stains • Stained sediment, silt or vegetation • Odor, petroleum, chemical Contact IDEP coordinator or MDEQ		Industrial Discharges Observations <ul style="list-style-type: none"> • Discolored water or vegetation • Odor, petroleum, chemical Contact IDEP coordinator and/or DPW	
Agricultural Runoff, Fertilizers, or Sanitary Sewer Waste Observations <ul style="list-style-type: none"> • Algae growth near drain outlet or in a ditch Contact IDEP coordinator, DPW and/or Drain Office		Soil Erosion from Construction Sites Observations <ul style="list-style-type: none"> • Bare soils or banks with no shoreline control fencing • Muddy discharge from an outfall Contact Local soil erosion control agency (gather the local community or county)	

IDEP = Inland Empire Pollution Prevention; DPW = Department of Public Works/Engineering; MDEQ = Michigan Department of Environmental Quality. 12/2012

Important Numbers

EMERGENCIES

- Police/Fire 911
- MDEQ Pollution Alert System (PEAS) 800-292-4706, 24 hrs

NON-EMERGENCIES

Livingston County	
Health Department	517-546-9858, 8 am - 5 pm
Drain Office	517-546-0040, 8 am - 5 pm
Macomb County	
Health Department	586-489-5228, 8 am - 5 pm
IDEP Hotline	877-679-4337, after 5 pm
IDEP e-mail	IDEP@macombcountymt.gov
Oakland County	248-858-0031, 24 hrs
St. Clair County	877-504-SWIM (7046), 24 hrs
Washtenaw County	734-222-3880, 8 am - 5 pm
Wayne County	866-223-2383, 24 hrs

Local IDEP Coordinator _____
 Local _____
 Soil Erosion Control Agency _____

Download this brochure to your computer. For more IDEP information, visit the website at <http://www.mdeq.state.mi.us/peas>

How to Spot Illicit Discharges A Tip Card for Municipal Staff



An illicit discharge is any discharge containing polluting material, such as sediment, nutrients, oil and bacteria. These discharges can drain to lakes and streams via storm drains. The communities in Southeast Michigan are required to prevent illicit discharges from entering storm water. You can do your part by notifying the appropriate agency when you spot a potential illicit discharge.

What to Report?

- Spills and contamination to lakes, rivers and streams
- Suspicious dumping to catch basins or waterways
- Unusual discharges from pipes
- Sewage on the ground or draining to surface water
- Large number of dead fish in waterways
- Failing or leaky septic systems
- Polluted runoff from storage piles or dumpsters to catch basins or waterways
- Sewage, detergent, chemical, petroleum or rotten egg odors
- Soil erosion from construction sites



GENESEE COUNTY DRAIN COMMISSIONER'S OFFICE

-DIVISION OF
SURFACE WATER MANAGEMENT

G-4608 BEECHER ROAD, FLINT, MI 48532
PHONE (810) 732-1590 FAX (810) 732-1474

Attachment
"D"
JEFFREY WRIGHT
COMMISSIONER

28 April 2014

Memorandum:

Reference: NPDES Ph II IDEP response
Correspondence From: Susanne Kubic

GCDC-SWM Field Staff,

Under Genesee County's NPDES Ph II permit, as the County's Agent, this office is responsible for responding to illicit connections and discharges (spills). The State wants us to have procedures to provide timely and effective referral of the prioritized screening results to the appropriate staff for follow up. The purpose of this memo is to provide guidance on what a timely response to a suspected Illicit Connection or Discharge is.

When GCDC staff witness a discharge or are notified by a 3rd party of an active discharge (spill) or a connection with an active discharge, Staff shall visit the site of the suspected Illicit Discharge within 3 business days for an initial site investigation. Although our policy is 3 business days, this office will make every effort to have GCDC staff onsite the same day we are notified. When GCDC staff witness a connection with no active discharge or are notified by a 3rd party of a connection that has intermittent discharge Staff shall visit the site of the suspected Illicit Discharge within 30 business days for an initial site investigation.

The time needed for subsequent follow up investigation will depend on what is found on site and the ability to contact the responsible party(s). Our main goal is to stop/contain active or intermittent discharges as quickly as possible and then permanently eliminate the illicit connection.

If you have questions or comments please feel free to contact our office. Thank you.

Sincerely,


Susanne Kubic

File: K:/stormwater/IDEP Memo.doc

Attachment "E"
Spill Notification Complaint Reporting Form

Spill Notification Complaint Reporting Form
Illicit Discharge Elimination Program
Genesee County

Complaint made by: _____

Phone #: _____

Date: _____ Time: _____

Location of Discharge: _____ Offending Party (if known) _____

Nature of Problem (i.e. paper waste, odor, color, etc.): _____

Is this an Emergency?

Yes ☐ (Then Phone 911) ☐ No

Nature of Emergency: _____

Initial Contact made to:

- 911
- Fire Dept. _____
- Police Dept. _____
- GCDC 732-1590
- GCDC 257-3612
- GCRC 767-4920
- PEAS Hotline (State) 1-800-292-4706
- Other _____

Additional Comments:

Site Investigation

Date of Observation: _____

Investigating Agency: _____

Location of Discharge: _____

- ☐ Initial Investigation
- ☐ Follow-up Investigation

Crew Members: _____

Investigation Location: _____

Observations (odor, color, volume, etc): _____

Actions Taken:

Danger to health and/or environment:

☐ Yes ☐ No

Were photos taken: ☐ Yes* ☐ No

Date Corrected: _____

* Please attach copies

If necessary:

Agency Referred to: _____

Agency Contact: _____

Method of Communication: _____

☐ E-mail ☐ Letter/memo ☐ Phone

Content of Communication: _____

Municipality: _____

TWP Section where incident occurred: _____

Spill Notification Complaint Reporting Form
 Illicit Discharge Elimination Program
 Genesee County

1. Take down complaint information.
2. Fill out the Spill Notification form for the Illicit Discharge Elimination Reporting System.
3. Inform the caller that the problem will be further investigated and thank him/her for calling in.
4. If the problems are related to sanitary please contact the Genesee County Health Department at (810) 257-3612.
5. If the problem is related to oil please phone 911.
6. If the spill/ discharge has released any polluting materials to the surface waters of the State or the ground waters of the State the appropriate district office must be notified immediately. Phone (517) 284-6651, fax: (517) 241-3571. You may call 24-hour Polluting Emergency Alerting System phone # (800) 292-4706 after hours.

7. Please fax completed form to appropriate agency:

Stephanie Kammer at the MDEQ and <u>kammers@michigan.gov</u> Phone 517-897-1597	Genesee County Drain Commissioner c/o Sue Kubic skubic@co.genesee.mi.us Phone 810-732-1590 Fax (810)732-1474
---	--

GCHD: Fax: (810) 257-3125
 GCRC: Fax: (810) 767-5373

Individual Permittee ERP

Attachment 2 to MDEQ Storm water Discharge Permit Application

1. Provide the ERP. The ERP shall include the applicant's expected response to violations to compel compliance with an ordinance or regulatory mechanism implemented by the applicant in the SWMP (e.g., written notices, citations, and fines). The ERP shall contain a method for tracking instances of non-compliance, including, as appropriate, the name of the person responsible for violation the applicant's ordinance or regulatory mechanism, the date and location of the violation, a description of the violation, a description of the enforcement response used, a schedule for returning the compliance, and the date the violation was resolved. The applicant may keep an electronic copy file of the enforcement tracking.

Section 14 of Draft IDEP Ordinance will be revised to designate violation of the ordinance as a misdemeanor, punishable by fine, jail or both. Violators will also be responsible for all costs of cleanup, remediation and restoration, including consultant costs, associated with the violation.

13. Provide the procedure for responding to illegal dumping/spills. The procedure shall include a schedule for responding to complaints, performing field observations. And follow-up field screening and source investigations as appropriate.

Any reports of illegal dumping would be directed the Vienna Township Code Enforcement Officer. Within 3 business days, he will conduct an appropriate level of investigation to determine the accuracy of the reported activity. If illegal dumping is confirmed or suspected, the Vienna Township Code Enforcement Officer would be complete the Spill Notification form and notify the appropriate agency immediately. Please note: while we say this will take place within 3 business days, every effort make will be to complete the inspection the same day as reported.

15. Provide the procedure that includes a requirement to immediately report any release of any polluting materials from the MS4 to the surface waters or ground waters of the state unless a determination is made that the release is not in excess of the threshold reporting quantities in the Part 5 Rules by calling the appropriate MDEQ District office, or if the notice is provided after regular working hours call the MDEQ's 24-Hour Pollution Emergency Alerting System telephone number: 800-292-4706

We use the Spill Notification form (Page 27-28 of the IDEP plan)

17. Provide the procedure for responding to illicit discharges once the source is identified. The procedure shall include a schedule to eliminate the illicit discharge and pursue enforcement actions. The procedure shall also address illegal spills/dumping

Appendix K has been added to the IDEP to show a schedule of events in the event of an illicit discharge, spill or illegal dumping. It is located after page 147 and is un-numbered and contains steps and a timeline of events from the time a complaint is filed through remediation/repair and enforcement action.

Illicit Discharge Ordinance/Regulatory Mechanism

Attachment 2 to MDEQ Storm water Discharge Permit Application

Community Name: Charter Township of Vienna

20. Provide the ordinance or regulatory mechanism in effect that prohibits non-storm water discharges the applicant's MS4 (except the non-storm water dischargers addressed in Questions 21 and 22).

23. Provide the ordinance or regulatory mechanism that regulates the contribution of pollutants to the applicant's MS4.

24. Provide the ordinance or regulatory mechanism that prohibits illicit discharges, including illicit connections and the direct dumping or disposal of materials into the applicant's MS4.

25. Provide the ordinance or regulatory mechanism with the authority established to inspect, investigate, and monitor suspected illicit discharges into the applicant's MS4.

26. Provide the ordinance or regulatory mechanism that requires and enforces elimination of illicit discharges into the applicant's MS4, including providing the applicant the authority to eliminate the illicit discharge.

With reference to questions 20 and 23-26. Vienna Township does NOT have an existing ordinance or regulatory mechanism that would prohibit non-storm water discharges into our MS4's. We are currently working on creating and adopting such an ordinance. Included with this attachment is a DRAFT of the proposed ordinance.

Because the adoption of the ordinance cannot be completed by April 1, 2014, we are also including a projected adoption schedule, (milestones listed below).

Revised Schedule for adoption of ordinance as of June 14, 2018:

1st reading by the Township Board will be on August 13th

Effective Date for the ordinance will be on September 14, 2018

Approval process will be take 2 meetings and a 30 day waiting period or an effective date within 3 months.

**The Charter Township of Vienna
Illicit Discharge and Connection Stormwater Ordinance**

THE CHARTER TOWNSHIP OF VIENNA ORDAINS:

Article I—Statement of Purpose

1.01 Purpose: The purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of the Charter Township of Vienna through the regulation of non-stormwater discharges to the storm drainage system to the maximum extent practicable as required by federal and state law.

1.02 Methods: This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system in order to comply with requirements of the National Pollutant Discharge Elimination System permit process.

1.03 Objectives: The objectives of this ordinance are:

A. To regulate the contribution of pollutants to the municipal separate storm sewer system by stormwater discharge by any user; and

B. To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system; and

C. To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance.

Article II—Definition

2.01 Authorized Enforcement Agency means employees or designees of the director of the municipal agency designated to enforce this ordinance.

2.02 BMP means Best Management Practices which are the schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

2.03 Clean Water Act means the Federal Water Pollution Control Act (33 USC §1251 et seq.), and any subsequent amendments thereto.

2.04 Construction Activity means activities subject to NPDES construction permits which include construction projects resulting in land disturbance of 5 acres or more.

2.05 Facility means any permanent, semi-permanent, or temporary structure, located on any parcel in the Township which has an industrial or commercial use.

2.06 Facility Operator means any person who is the owner, occupant, or tenant of any Facility in the Township, or the agent or employee of the owner, occupant or tenant of any Facility located in the Township or any other person who has any control of any Facility located in the Township.

2.07 Hazardous materials means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

2.08 Illegal Discharge means any direct or indirect non-stormwater discharge to the storm drain system, except as exempted in **Article VII** of this Ordinance.

2.09 Illicit Connections means either of the following:

A. Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency; or

B. Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

2.10 Industrial Activity means any activity subject to NPDES Industrial Permits as defined in 40 CFR §122.26(b)(14).

2.11 MDEQ means the Michigan Department of Environmental Quality.

2.12 MS4 means the Township Municipal Separate Storm Sewer System.

2.13 NPDES means National Pollutant Discharge Elimination System.

2.14 NPDES Discharge Permit means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC §1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

2.15 Non-Stormwater Discharge means any discharge to the storm drain system that is not composed entirely of stormwater.

2.16 Parcel of Property means that property which is identified by a single parcel number by the Township Treasurer.

2.17 Person means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agents.

2.18 Pollutant means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatable; pesticides, herbicides and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

2.19 Storm Drainage System means publicly-owned facilities by which stormwater is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

2.20 Stormwater means any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

2.21 Stormwater Pollution Prevention Plan means a document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or Receiving Waters to the maximum extent practicable.

2.22 Township means the Charter Township of Vienna.

2.23 Township Board means the Township Board of Trustees for the Charter Township of Vienna.

2.24 Wastewater means any water or other liquid, other than uncontaminated stormwater, discharged from a Facility.

Article III—Permit

3.00 NPDES Stormwater Phase II Permits: The owner of any Parcel of Property must obtain a NPDES Stormwater Phase II permit for any construction projects resulting in activities involving land disturbance of 1 acre or more, including but not limited to clearing and grubbing, grading, excavating, and demolition.

Article IV—Applicability

4.00 Applicability: This ordinance applies to all water entering the storm drain system generated on any developed and undeveloped Parcel of Property unless explicitly exempted by an authorized enforcement agency.

Article V—Responsibility for Administration

5.01 Responsibility for Administration: The Township and/or its Engineer shall be the authorized enforcement agency and shall administer, implement, and enforce the provisions of this ordinance.

5.02 Delegation of Powers and Duties: The Township Board may by resolution delegate any powers granted or duties imposed upon the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the authorized enforcement agency.

Article VI—Ultimate Responsibility

6.01 Minimum Standards: The standards set forth herein and promulgated pursuant to this ordinance are minimum standards.

6.02 Ultimate Responsibility: This ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

Article VII—Discharge Prohibitions

7.01 Discharge Prohibition: The commencement, conduct or continuance of any non-authorized discharge to the storm drain system on or from any Parcel of Property is prohibited except as provided in *Paragraph 7.04*.

7.02 Prohibition of Illegal Discharges: No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater.

7.03 Prohibition of Illicit Connections: The construction, use, maintenance or continued existence of illicit connections to the storm drain system on any Parcel of Property is prohibited, provided as follows:

A. This prohibition includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

B. A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

7.04 Exemptions: The following discharges are exempt from discharge prohibitions established by this ordinance, providing they are not identified as significant contributors to violations of water quality standards:

- A. Water line flushing or other potable water sources;
- B. Landscape irrigation or lawn watering, and irrigation waters;
- C. Diverted stream flows and flows from riparian habitats and wetlands;
- D. Rising ground water and springs;
- E. Uncontaminated ground water infiltration and seepage;
- F. Uncontaminated pumped ground water except for groundwater cleanups specifically authorized by NPDES permits;
- G. Foundation drains, water from crawl space pumps, footing drains and basement sump pumps (not including active groundwater dewatering systems);

H. Air conditioning condensation; waters from non-commercial washing of vehicles;

I. Street wash water; de-chlorinated swimming pool water from single, two, or three family residences;

J. Firefighting activities;

K. Any other water source not containing Pollutants.

L. Dye testing done under the authorization of the MDEQ (General Rule 97) provided that the MDEQ receives a complete Notice of Intent to the MDEQ at least 21 days prior to the time of the test.

M. Any non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

Article VIII—Suspension of MS4 Access

8.01 *Suspension due to Illicit Discharges in Emergency Situations:* The Township Engineer may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or water of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or waters of the United States, or to minimize danger to persons.

8.02 *Suspension due to Detection of Illicit Discharge:* Any person discharging to the MS4 in violation of this Ordinance may have their MS4 access terminated if such termination would abate or reduce an illicit discharge.

8.03 *Notice of Termination of MS4 Access:* The Township Engineer must notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.

8.04 *Continued Violation:* A person is in violation of this Ordinance if the person reinstates MS4 access to a Parcel of Property terminated pursuant to this **Article VIII**, without the prior approval of the Township.

Article IX—Industrial or Construction Activity Discharges

9.00 Industrial or Construction Activity Discharges: Any person subject to an industrial or construction activity NPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the authorized enforcement agency prior to the allowing of discharges to the MS4.

Article X—Monitoring of Discharges

10.01 Applicability: This **Article X** applies to all facilities that have stormwater discharges associated with industrial activity, including construction activity.

10.02 Access to Facilities: Inspection of facilities subject to regulation under this Ordinance must be permitted, as follows:

A. A Facility Operator must permit the Township to enter and inspect Facilities subject to regulation under this Ordinance as often as may be necessary to determine compliance with this Ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its Parcel of Property or Facility, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.

B. A Facility Operator must grant the Township ready access to all parts of the Parcel of Property and Facility for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by state and federal law.

C. A Facility Operator must grant the Township ready access to all parts of the Parcel of Property and Facility required for the purposes of setting up such devices as are necessary, in the opinion of the authorized enforcement agency, to conduct monitoring and/or sampling of the Facility's stormwater discharge.

D. The Township has the right to require the discharger to install monitoring equipment as necessary. The Facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.

E. Any temporary or permanent obstruction to safe and easy access to the Facility to be inspected and/or sampled shall be promptly removed by the

operator at the written or oral request of the Township and shall not be replaced. The costs of clearing such access shall be borne by the operator.

F. Unreasonable delays in allowing the Township access to a permitted Facility is a violation of a stormwater discharge permit and of this Ordinance. A person who is the operator of a Facility with a NPDES permit to discharge stormwater associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted Facility for the purpose of conducting any activity authorized or required by this Ordinance.

G. If the Township has been refused access to any part of the Parcel of Property or Facility from which stormwater is discharged, and is able to demonstrate probable cause to believe that there may be a violation of this Ordinance, or that there is a need to inspect, and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the Township may seek issuance of a search warrant from any court of competent jurisdiction.

Article IX—Requirement to Prevent, Control and Reduce Stormwater Pollutants by the Use of Best Management Practices

11.01 *Requirement to Prevent, Control and Reduce Stormwater Pollutants by the Use of Best Management Practices:* The Township will adopt requirements identifying Best Management Practices for any activity, operation, or Facility which may cause or contribute to pollution or contamination of stormwater, the storm drain system, or waters of the United States.

11.02 *Reasonable Protection from Accidental Discharge:* A Facility Operator must provide, at its own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs.

11.03 *Additional BMPs:* Any person responsible for any Parcel of Property, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system.

11.04 *Compliance with Valid NPDES Permit:* Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this **Article XI**.

11.05 Stormwater Pollution Prevention Plan: The BMPs set forth in this **Article XI** shall be part of a stormwater pollution prevention plan as necessary for compliance with requirements of the NPDES permit.

Article XII—Watercourse Protection

12.02 Watercourse Protection: Every person owning Parcel of Property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the Parcel of Property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse.

12.02 Privately Owned Structures: Every person owning or leasing Parcel of Property must maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

Article XIII—Notification of Spills

13.01 Discovery Actions: Notwithstanding other requirements of law, any person responsible for a Facility or operation must take all actions necessary to ensure the discovery of any known or suspected release of materials which result or may result in illegal discharges or pollutants or hazardous materials discharging into any stormwater, the Township storm drain system, or any water of the United States.

13.02 Notification of Spills: Notwithstanding other requirements of law, any person responsible for a Facility or operation must immediately notify the Township and all emergency response agencies via emergency dispatch services of any known or suspected release of materials which result or may result in illegal discharges or pollutants or hazardous materials discharging into any stormwater, the Township storm drain system, or any water of the United States.

13.03 Containment and Cleanup: Notwithstanding other requirements of law, any person responsible for a Facility or operation or responsible for emergency response for a Facility or operation must forthwith must take all necessary steps to ensure the containment, and cleanup of any known or suspected release of materials which result or may result in illegal discharges or pollutants or hazardous materials discharging into any stormwater, the Township storm drain system, or any water of the United States.

13.04 Non-Hazardous Materials: In the event of a release of non-hazardous materials, any person responsible for a Facility or operation or responsible for emergency response for a Facility or operation must provide the Township with notice thereof in

person or by phone or facsimile no later than the next business day. Notifications in person or by phone must be confirmed by written notice addressed and mailed to the Township within 3 business days of the personal or phone notice.

13.06 *Commercial or Industrial Establishments:* If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of any known or suspected release of materials which result or may result in illegal discharges or pollutants or hazardous materials discharging into any stormwater, the Township storm drain system, or any water of the United States and the actions taken to prevent its recurrence. Such records shall be retained for at least 3 years.

Article XIV—Enforcement

14.01 *Notice of Violation:* Whenever the Township finds that a person has violated a prohibition or failed to meet a requirement of this Ordinance, the Township Engineer may order compliance by written notice of violation to the responsible person. Such notice may require, without limitation:

- A. The performance of monitoring, analyses, and reporting;
- B. The elimination of illicit connections or discharges;
- C. That violating discharges, practices, or operations shall cease and desist;
- D. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected Parcel of Property;
- E. Payment of a fine to cover administrative and remediation costs; and
- F. The implementation of source control or treatment BMPs.

14.02 *Abatement of a Violation and/or Restoration:* If abatement of a violation and/or restoration of affected Parcel of Property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

Article XV—Appeal of Notice of Violation

15.00 *Appeal of Notice of Violation:* Any person receiving a Notice of Violation may appeal the determination of the Township Engineer, subject to the following:

- A. The notice of appeal must be received within 7 days from the date of the Notice of Violation.
- B. Hearing on the appeal before the Township Board shall take place within 21 days from the date of receipt of the notice of appeal.
- C. The decision of the Township Board shall be final.

Article XVI—Enforcement Measures after Appeal

16.01 *Enforcement Measures after Appeal:* If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or, in the event of an appeal, within 35 days of the decision of the Township Board upholding the decision of the Township Engineer, then representatives of the Township shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the Parcel of Property.

16.02 *Refusal Prohibited:* A person who is an owner, agent or occupant of any Parcel of Property is prohibited from refusing to allow the Township, or designated contractor to enter upon the Parcel of Property for the purposes taking any and all measures necessary to abate the violation and/or restore the Parcel of Property.

Article XVII—Cost of Abatement of the Violation

17.01 *Cost of Abatement of the Violation:* Within 14 days after abatement by the Township of any violation of this Ordinance, the owner of the Parcel of Property will be notified by regular mail sent to the address of record for the Owner of the Parcel of Property of the assessment for the cost of abatement, including administrative costs.

17.02 *Objection to Assessment:* The Parcel of Property owner must pay the assessment or file with the Township Clerk a written objection to the amount of the assessment within 14 days of the mailing of the Notice of the Assessment.

17.03 *Payment of Assessment:* If the Parcel of Property owner does not pay the amount due is not paid within 14 days of mailing of the Notice of Assessment, and the Parcel of Property owner does not file with the Township Clerk a written objection to the amount of the assessment within 14 days of the mailing of the Notice of Assessment, the

charges shall become a special assessment against the Parcel of Property and shall constitute a lien on the Parcel of Property for the amount of the assessment.

Article XVIII—Injunctive Relief

18.00 *Injunctive Relief:* It shall be unlawful for any person to violate any provision or fail to comply with any Article of this Ordinance. If a person has violated or continues to violate the provisions of this Ordinance, the authorized enforcement agency may petition a court of competent jurisdiction for a preliminary or permanent injunction restrain the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

Article XIX—Penalties

19.01 *Civil Infraction:* Any person who violates this Ordinance is guilty of a civil infraction and will, upon being found responsible for a first offense thereof, be fined not more than \$500, plus the cost of prosecution. Each day that a violation continues is deemed a separate offense.

19.02 *Misdemeanor:* Any person who violates this Ordinance is guilty of a misdemeanor and will, upon conviction of a second or more offense thereof, be punished by a fine not to exceed \$500 and the cost of prosecution, or in default of payment thereof, by imprisonment in the County Jail for a period not to exceed 92 days, or by both such fine and imprisonment as ordered by the Court in its discretion. Each day that a violation continues is deemed a separate offense.

19.03 *Nuisance:* In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expenses, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

19.04 *Actual Costs:* The Township may recover actual attorney fees, court costs, and other expenses associated with the enforcement of this Ordinance, including sampling and monitoring expenses.

19.05 *Rights and Remedies are Cumulative:* The prohibitions and penalties provided by this article are in addition to, and not exclusive of, prohibitions and penalties provided by other applicable laws, articles, rules, or regulations.

Article XX—Severability

20.0 Severability: The provisions of this ordinance are hereby declared to be severable, and if any clause, sentence, paragraph, section, or subsection is declared void or inoperable for any reason, it will not affect any other part or portion thereof.

Article XXI—Effective Date

21.0 Effective Date: This ordinance becomes effective upon the _____ day of _____, 2018, following publication of its final passage. This ordinance must be published in a newspaper circulated within the Charter Township of Vienna, Genesee County, Michigan.

CERTIFICATION:

We, the undersigned, being respectively the Township Supervisor and Township Clerk of Vienna Charter Township, Genesee County, Michigan, do hereby certify that the above Vienna Township Ordinance was duly adopted by the Township Board of the Charter Township of Vienna, at which meeting a quorum was present.

Joseph A. Rizk, Supervisor

Cynthia J. Bryan, Clerk

GENESEE COUNTY

Illicit Discharge Elimination Program

FIELD PROTOCOL MANUAL



Prepared by:



**March 2014
DRAFT**

CONTENTS

	PAGE
INTRODUCTION	1
Phase II Illicit Discharge Elimination Requirements	1
What is an Illicit Connection?	1
What is an Illicit Discharge?	1
What are Acceptable Non-Storm Water Discharges?	2
Genesee County's Illicit Discharge Elimination Plan	2
Purpose of this Protocol Manual	2
A. INITIAL PLANNING	4
A.1 Weekly Work Plans	4
A.2 Traffic Control Plans	4
A.3 Intent of Work Notification	4
B. FIELDWORK PREPARATION	5
B.1 Weather Conditions	5
B.2 Supplies and Equipment	5
C. PHASE I INVENTORY FIELDWORK	6
C.1 Locating the Discharge Points and Outfalls	6
C.2 Traffic Control	7
C.3 Drainage System Inventory	7
C.4 Inventory – Sketch	7
C.5 Inventory – Photo	8
C.6 Inventory – Pipes	9
D. SCREENING PHASE FIELDWORK	10
<i>Dry Weather Flow</i>	10
D.1 Observations	11
<i>Floatables</i>	11
<i>Odor</i>	12
<i>Foam</i>	12
<i>Other Indicators</i>	12
<i>Chemical Analysis</i>	12

	<i>Results/Actions</i>	13
D.2	Sample Collection	13
	<i>Free Fall Discharge Sampling</i>	14
	<i>Open Channel Sampling</i>	14
	<i>Manhole Pipe Sampling</i>	14
	<i>Field Testing</i>	15
	<i>Laboratory Testing</i>	15
D.3	Flow Measurements	16
D.4	Notification	17
E.	PHASE I AND PHASE II POST FIELDWORK	18
E.1	Data Entry	18
E.2	Evaluate Results	20
	<i>Reporting a Suspected Illicit Discharge</i>	20
E.3	Signs of an Illicit?	20
E.4	Source Isolated?	21
	<i>Sound Testing</i>	21
F.	SOURCE CONFIRMATION	23
F.1	Televising and Dye Testing	23
F.2	Source Confirmed	23
G.	NOTIFICATION	24
G.1	Notification of Additional Discharge points and outfalls	24
	<i>Requirements</i>	24
G.2	Notification of Illicit Discharges and/or Connections	24
	<i>Requirements</i>	24
G.3	Reporting Other Field Observations	25

CONTENTS

APPENDICES

- Appendix A Supplies and Equipment
- Appendix B pH Pen Calibration Instructions
- Appendix C Structure Numbering
- Appendix D DEQ Fact Sheets
- Appendix E Sampling Devices
- Appendix F Flow Measurement Methods
- Appendix G Contact Information
- Appendix H MSDS
- Appendix I Paper Field Forms
- Appendix J Genesee IDEP SOP

LIST OF TABLES AND FIGURES

Tables	Page
Table 1 - Sample Parameter Information	16
 Figures	
Figure 1 - Planning Flow Chart	4
Figure 2 - Preparation Flow Chart	5
Figure 3 - Inventory Flow Chart	6
Figure 4 - Example of Sketch	8
Figure 5 - Photo Label Sample	8
Figure 6 - Fieldwork Flow Chart	10
Figure 7 - Post Fieldwork Flow Chart	18
Figure 8 - IDEP Data Management System	19
Figure 9 - Parameter Cut-Off Limits	20
Figure 10 - Source Confirmation Flow Chart	23

INTRODUCTION

PHASE II ILLICIT DISCHARGE ELIMINATION REQUIREMENTS

The United States Environmental Protection Agency's (EPA) Phase II Storm Water regulations require all permitted MS4 communities and agencies to address six minimum measures. Amongst the six measures are the Illicit Discharge Detection and Elimination Minimum Control Measures. Under the regulations, these measures must include the following:

- A storm sewer system map showing the location of all discharge points and outfalls and the names and location of all waters of the United States that receive discharges from those points.
- Through an ordinance or other regulatory mechanism, a prohibition on non-storm water discharges into the MS4 community and appropriate enforcement procedures and actions.
- A plan to detect and address non-storm water discharges, including illegal dumping into the MS4 community.
- The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste.
- The determination of appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

WHAT IS AN ILLICIT CONNECTION?

An illicit connection is the discharge of pollutants or non-storm water materials into a storm sewer system via a pipe or other direct connection. Sources of illicit connections may be sanitary sewer taps, wash water from commercial laundry facilities or carwashes, and other similar sources.

WHAT IS AN ILLICIT DISCHARGE?

An illicit discharge is the discharge of pollutants or non-storm water materials to the storm sewer systems via overland flow or direct dumping of materials into a catch basin. Some examples of illicit discharges include the overland drainage from a carwash, or dumping used motor oil in or around a catch basin.

WHAT ARE ACCEPTABLE NON-STORM WATER DISCHARGES?

Acceptable non-storm water discharges include:

- Water line flushing and discharge from potable water sources
- Landscape irrigation runoff, lawn watering runoff, and irrigation waters
- Diverted stream flows and flows from riparian habitats and wetlands
- Rising groundwater and springs
- Uncontaminated groundwater infiltration and seepage
- Uncontaminated pumped groundwater, except for groundwater cleanups specifically authorized by NPDES permits
- Foundation drains, water from crawl space pumps, footing drains, and basement sump pumps
- Water from non-commercial, residential car washing
- De-chlorinated swimming pool water from single, two, or three family residences. (A swimming pool operated by the permittee shall not be discharged to a separate storm sewer or to surface waters of the state without NPDES permit authorization from the MDEQ.)
- Residual street wash waters
- Discharges or flows from emergency firefighting activities

GENESEE COUNTY'S ILLICIT DISCHARGE ELIMINATION PLAN

Genesee County has received an NPDES Phase II Storm Water Certificate of Coverage (COC). The County has been and will continue to conduct IDEP investigations for all participating municipalities within the County's permit agreement.

PURPOSE OF THIS PROTOCOL MANUAL

The purpose of this manual is to define the procedures for the Illicit Discharge Elimination Program (IDEP) plan. This manual reviews the steps used to find and locate illicit connections/discharges. The primary steps are:

- A. Planning
- B. Preparation
- C. Inventory Phase Fieldwork
- D. Screening Phase Fieldwork
- E. Post Fieldwork
- F. Source Confirmation

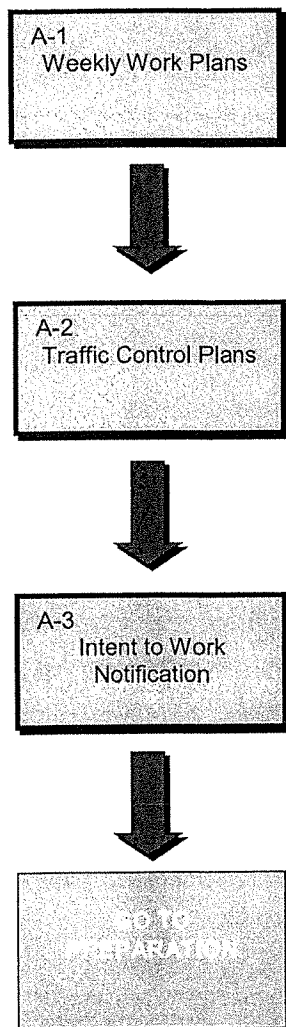
Also discussed are notification requirements and procedures, contact information, structure numbering and health and safety issues.

The IDEP investigations in Genesee County will initially focus on the inventory phase of the fieldwork. The inventory phase will identify the location of discharge points and outfalls and determine which of these should be revisited for further investigation during the screening phase by identifying the presence or absence of dry weather flow and documenting physical observation of the site. This data will be used to prioritize the screening phase of the investigations.

The screening phase will be conducted as suspected problems arise. The screening phase will look at those discharge points and outfalls which have dry weather flow and identify, through sampling, if an illicit connection is present. If an illicit connection is present, the storm sewer system will be further investigated until the source is identified and removed.

A. INITIAL PLANNING

Figure 1 - Planning Flow Chart



Prior to beginning investigation planning, a copy of the discharge points and outfall maps submitted with the permit application must be obtained. Storm sewer drainage maps should also be acquired, if available. Other valuable information that may be collected, if applicable and available, includes:

- Land use maps
- Age of development
- CSO areas
- Depth of groundwater
- Areas of failing infrastructure
- Contact information

A.1 WEEKLY WORK PLANS

Weekly work plans should be developed to identify the discharge points and outfalls or points to investigate for that week's work and the roads where lane closures may be occurring. The weekly work plans should also remind the crew to confirm that the weather is appropriate and to check supplies.

A.2 TRAFFIC CONTROL PLANS

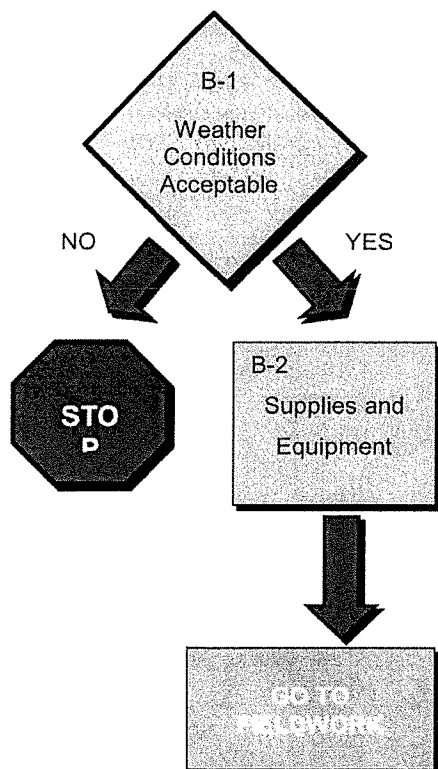
Traffic control must be conducted in accordance with the local community's traffic control requirements and individual company policy and procedures. Work required on the MDOT rights-of-way must follow the Michigan Manual of Uniform Traffic Control Devices.

A.3 INTENT OF WORK NOTIFICATION

If work is required on Michigan Department of Transportation (MDOT) rights-of-way, an Advanced Notice form must be completed and sent to the MDOT Transportation Service Center five days prior to the field visit. If work is being conducted on private property the landowner must also be notified at least one week prior to fieldwork. All local intent of work notifications must be followed.

B. FIELDWORK PREPARATION

Figure 2 - Preparation Flow Chart



B.1 WEATHER CONDITIONS

To minimize the chance of observing and sampling wet weather storm water flow, a dry weather period of 72 hours with less than 0.10 inches of total precipitation must be observed prior to sampling.

Screening phase fieldwork, therefore, must be planned several days in advance based on the precipitation totals and the forecast. Weather data should be checked prior to going into the field. This data can be obtained from the National Weather Service website www.weather.gov or commercial weather sites such as www.accuweather.com or from local rain gauges.

B.2 SUPPLIES AND EQUIPMENT

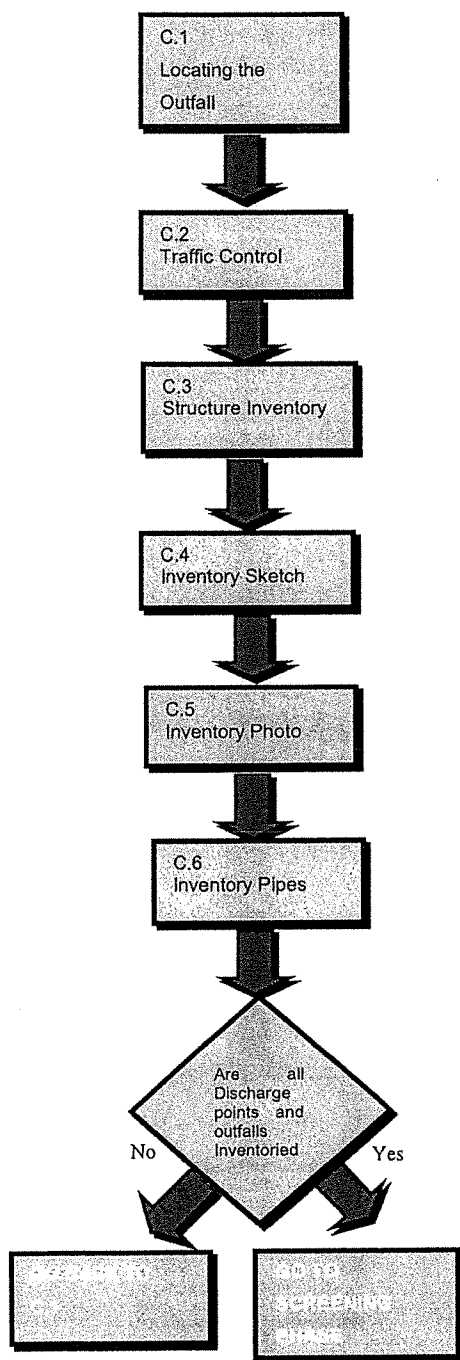
To insure that the proper equipment and supplies are available for field investigations, supplies and equipment should be inventoried prior to any scheduled fieldwork day.

A suggested list of supplies and equipment for field investigations is located in Appendix A.

At least once a week, field testing equipment must be calibrated against a known standard. The calibration instructions and procedures for using the pH pen are located in Appendix B. The thermometer should be verified by comparison with a certified thermometer. Each time the thermometer and pH pen are verified, the results must be recorded on a calibration log provided in Appendix B.

C. PHASE I INVENTORY FIELDWORK

Figure 3 - Inventory Flow Chart



The inventory phase will be the initial phase of fieldwork conducted in the IDEP investigation. This phase focuses on finding the structures, geo-referencing them, and documenting their physical characteristics. These characteristics include its latitude and longitude coordinate location, the type of structure, the size of the structure, and the number and size of conduits entering the structure. An inventory should be completed for each structure visited. Only one inventory should be conducted per structure, therefore, subsequent visits will not require an inventory sheet to be completed unless the structure has been altered.

During the inventory phase, the investigator will also identify the presence of dry weather flow and make physical observations of the site. This data will be recorded on the screening form in the database.

C.1 LOCATING THE DISCHARGE POINTS AND OUTFALLS

Identifying the location of structures in the field should be done by utilizing the previously mentioned maps submitted with the NPDES Phase II permit, in conjunction with municipal drainage system maps. If reliable latitude and longitude data is available a GPS unit may be used to locate the structures..

C.2 TRAFFIC CONTROL

As previously specified, traffic control must be conducted in accordance with the local municipality's traffic control requirements. Work required on the MDOT rights-of-way (ROW) must follow the Michigan Manual of Uniform Traffic Control Devices.

C.3 DRAINAGE SYSTEM INVENTORY

A brief description of each field is provided below.

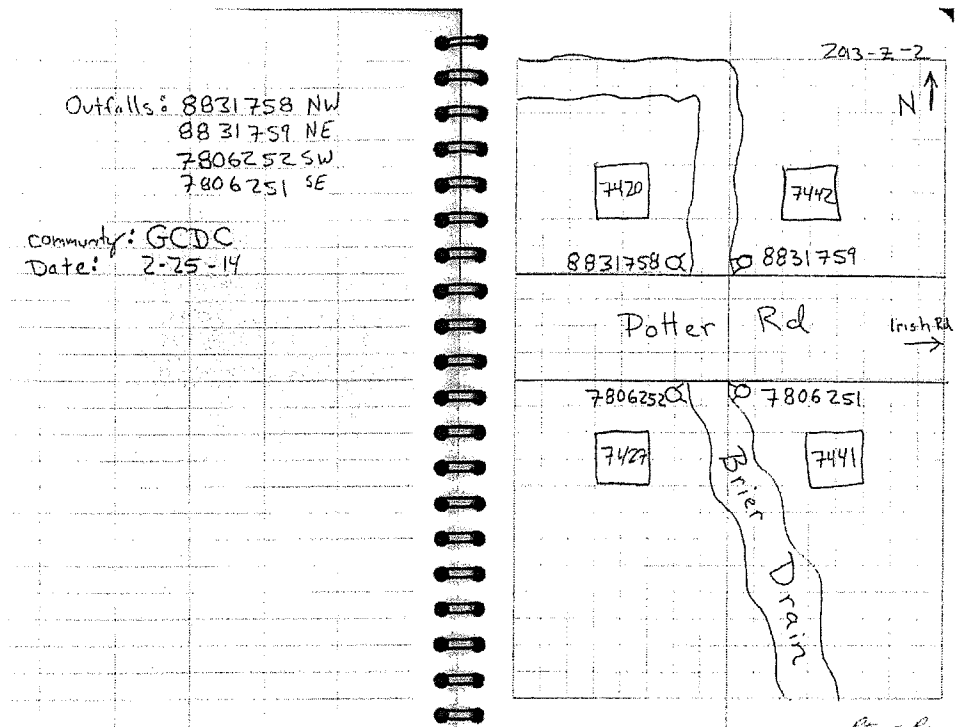
SELECTIONS

Date:	Date of fieldwork
Crew 1 & Crew 2:	Field crew initials
Structural ID:	Id of structure
County Assigned ID:	Same as Structural ID unless county assigned another ID
Structure Type:	Discharging Pipe, Manhole, Catch Basin, Culvert Outlet, Point in Open Channel, Not Found, Blind Tie or Tap, Non-Point Source
Ownership:	Public, private, GCDC, GCRC, other
Photo Number:	Number of photo (using identification board in photo)
Latitude/Longitude:	GPS location of structure
XY_Accuracy:	Sub-meter GPS, sub-centimeter GPS, estimates from USGS, estimated from Google Earth
Receiving Water Body:	Name of receiving water body (required)
Offset Description:	Description of structure offset
Inventory Comments:	Any comments by the field investigator

C.4 INVENTORY – SKETCH

Sketches are done in All-Weather Field Books and then scanned as an image and downloaded to the IDEP website. The inventory sketch is an opportunity to provide a diagram of the structure location in respect to buildings, rivers, and roads, or just to provide any visual description of the structure.

Figure 4 - Example of Sketch



C.5 INVENTORY – PHOTO

Inventory Photo is to take a snapshot of the structure for reference of a problem with structure or water quality. Use a camera and dry-erase board to identify the structure number, date and community. Put the Structure ID, community and date on the dry-erase board and place the board in front of the structure so you can identify the photo.

Figure 5 - Photo Label Sample



C.6 INVENTORY – PIPES

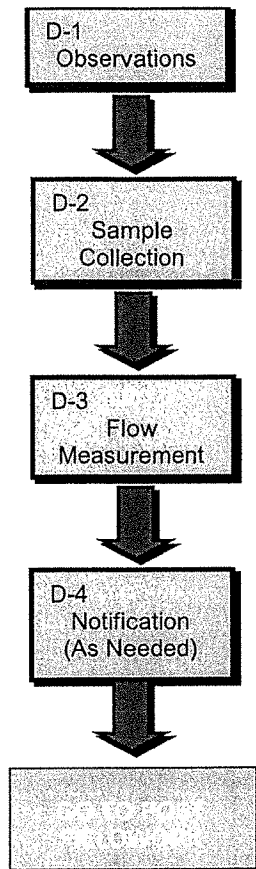
A pipe inventory data form must be completed for all conduits to and from the structure or making up the structure. These include a pipe discharging into a water body, an open channel, or the pipes entering and leaving a manhole. Multiple pipe inventory data forms can be filled out for one structure inventory or inventory sketch.

A brief description of each field is provided below.

Pipe ID:	City assigned ID (not required)
Pipe Direction:	N, NE, E, SE, S, SW, W, NW
Conduit Type:	Unknown, Pipe, Culvert End, Open Channel
Shape:	Unknown, Round, Rectangular, Elliptical, Open Channel
Diameter:	Diameter of pipe (inches)
Width:	Width of open channel or rectangular pipe (inches)
Depth:	Open channel (inches)
Measure Down:	Rim to manhole bottom (feet)
Invert Elevation:	Rim to pipe invert
Conduit Material:	Unknown, RCP, VCP, Brick, Poured-in-Place, PVC, Segmented Tile, Cast Iron, DIP, Corrugated Steel Pipe, Clay Tile Pipe, Other
Inlet/Outlet:	Inlet: flow entering a structure Outlet: flow leaving a structure
General Comments:	Any comments regarding the pipe

D. SCREENING PHASE FIELDWORK

Figure 6 - Fieldwork
Flow Chart



The screening phase investigates each of the discharge points and outfalls identified during the inventory phase of the program for illicit connections. To conduct a screening on a structure, record physical observations, calculate flow rates, and take samples (if necessary).

Screenings may be repeated for structures if the results of a previous screening suggest that an illicit connection may be present. In this scenario, a new inventory of the structure is not needed, but a new screening record must be made in the database to show the results from that day's investigation. The observations, sample results, and flow measurements should all be recorded in the database.

Dry Weather Flow

Dry weather flow can be a valuable tool to determine the presence of illicit connections or discharges. Dry weather flow is flow that is observed 72 hours after the last rainfall greater than 0.10 inches and may indicate the presence of an illicit connection or discharge. Dry weather by itself may not indicate an illicit discharge problem however, as there are many sources of non-storm water discharge like those listed in the introduction section of this manual. If dry weather flow alone is observed, other indicators should be explored that could provide further evidence of an illicit connection.

If no flow is present during the initial screening, but evidence such as staining or odor indicates an illicit connection may be present, a check for intermittent dry weather flow should be made. To check for intermittent flows, place a sandbag so that it is blocking the lower part of the flow channel of the pipe or open channel in question. If a dry weather flow check is required in a

manhole, a sandbag can be secured to a rope and lowered into position. Secure the top of the rope to a manhole step for easy retrieval. Sandbags should only remain in the conduit for a maximum of 1 to 2 days, and never when rain is forecasted. If water has ponded behind the sandbag and no rain has fallen, then intermittent flow is likely. Be sure to remove the sandbags after testing is completed.

D.1 OBSERVATIONS

Careful observation of conditions at an outfall structure is critical in determining the likelihood of an illicit connection within the upstream drainage system. Physical observations such as odor, staining, coloring, and deposition can strongly indicate an illicit discharge is present, even though no dry weather flow is observed. Observations of the receiving water body are also noted.

Odor:	None, Musty, Sewage, Rotten Egg, Gas, Oil, Other
Floatables:	None, Trash, Sewage, Bacterial Sheen, Oil Sheen, Suds, Other
Deposits/Stains:	None, Mineral, Sediment, Oily, Grease, Suds, Other
Vegetation:	None, Normal, Excessive, Algae, Slime
Structural:	Normal, Cracking, Spalling, Corrosion, Settlement, Other
Color:	Clear, Light Brown, Dark Brown, Green, Gray, Black, Other
Turbidity:	Enter #
Description:	Any observation of structure that needs to be addressed

RECEIVING WATER OBSERVATIONS

Odor:	None, Musty, Sewage, Rotten Egg, Gas, Oil, Other
Floatables:	None, Trash, Sewage, Bacterial Sheen, Oil Sheen, Suds, Other
Deposits/Stains:	None, Mineral, Sediment, Oily, Grease, Suds, Other
Vegetation:	None, Normal, Excessive, Algae, Slime
Structural:	Normal, Cracking, Spalling, Corrosion, Settlement, Other
Color:	Clear, Light Brown, Dark Brown, Green, Gray, Black, Other
Turbidity:	Enter #
Description:	Any observation of structure that needs to be addressed

Floatables

The occurrence of floatables in the storm sewer system can be one of the most defining pieces of

evidence. Floatables can consist of a variety of items including oil sheens, sewage, and sanitary trash, such as toilet paper. If sewage and/or sanitary trash are observed in the storm sewer system, it is an indicator that a sanitary system is connected. Floatables may naturally occur, like those found in streams and rivers, including algae, bryozoans, pollen, and oil-like sheens, which may actually be bacteria. Additional information on naturally occurring floatables is presented in Appendix D.

If floatables are observed in lakes or streams, an attempt to identify a relationship between these materials and any nearby discharge points and outfalls should be made. If it appears that the floatables are originating from a structure, it could be a sign of an illicit discharge.

Odor

Strong chemical or sewage odors in a storm sewer may indicate a potential illicit connection or discharge. If odors are detected, one should look for other indicators including floatables, dry weather flow, water color, and/or stains inside the manhole or pipes.

Foam

The occurrence of accumulations of foam in a storm sewer system may indicate an illicit connection or discharge. Foam can be a natural occurrence in streams and lakes, but if the foam is concentrated around a storm sewer, or appears to be originating from a structure, it may be an indication of an illicit connection or discharge in that system. Additional information on foam is shown in Appendix D.

Other Indicators

Other indicators, which may not be significant by themselves, can provide valuable additional evidence to any of the above indicators. These indicators include color, turbidity, the existence of stains or deposits, and the occurrence of excessive vegetation at the discharge point. The structural observations on the screening form are helpful for explaining sources of dry weather flow and do not necessarily indicate the presence of an illicit discharge.

Chemical Analysis

Chemical and physical testing is performed on dry weather flow water samples to determine if an

upstream investigation is warranted. Water samples for surfactant, ammonia, and E. coli are collected and submitted to a contract lab for analysis. A multi-parameter testing pen is used in the field to determine pH, temperature and specific conductance. Results of the field tests are noted on the screening form.

CHEMICAL ANALYSIS

Lab Sample ID:	ID tagged on lab sample
Surfactants:	mg/L
Ammonia:	mg/L
E.Coli	per100ml
Temperature:	Fahrenheit
pH:	
Specific Cond.:	μS

Results/Actions

As the inventory and screening process goes forward, decisions must be made about the best way to proceed. If the observations and testing are conclusive that no illicit discharge is likely to be present, then the investigation is concluded and no further work is done. If there is an indication that an illicit discharge is present, then further investigation is inventory required. Each form contains a listing of the options to follow based on the latest screening and lab results.

RESULTS/ACTIONS

Screening Results:	Illicit Connection Ruled Out, Illicit Connection, Pending, Notify County, Not a Point Source Discharge
Screening Actions:	None Required, Illicit Removed, Waiting on Lab Results, Dye Test, Televis, Investigate Further, Illicit Connection
Analysis Comments:	Any analysis comments by user
Other values as indicated	

D.2 SAMPLE COLLECTION

When dry weather flow is observed, a sample of the flow must be collected for chemical analysis. Samples of standing water should not be collected. The samples are tested at an

analytical lab for ammonia, detergents, and *E-Coli*. In the field, temperature and pH are taken for each sample and recorded on the screening form. Samples should be collected prior to flow measurements in order to ensure undisturbed samples.

Free Fall Discharge Sampling

To sample free fall discharge, secure the appropriate bottles and fill out the required information on the bottle label. Remove the bottle cap with caution as not to spill any preservative inside. Place the bottle in the flow and collect sample to the top of the shoulder of the bottle. Do not overflow bottle. If possible, avoid the introduction of sediment or other debris in the sample. Replace the cap securely and store the sample on ice in a plastic cooler for transfer to the laboratory.

Open Channel Sampling

If flow is observed in an open channel, a disposable plastic syringe may be used to obtain a sample. You may obtain a sterile, 60 ml disposable plastic syringe from a scientific supply company such as Fisher Scientific Company or a veterinary supply company. Syringe a portion of sample from the flow stream taking care not to include sediment or debris in the sample. Transfer the sample from the syringe to the appropriate bottle and secure the cap. Store as above for transfer to the laboratory.

Manhole Pipe Sampling

Sampling flow in a manhole presents several challenges. Since any manhole is considered a confined space, a manhole may not be entered to obtain a sample. Instead, a telescopic extension rod is used to reach the pipe to be sampled. Depending on the conditions in the manhole at the time of sampling, either a bottle holder or a syringe can be used to obtain a sample. To avoid confusion, label all bottles before sampling begins.

- **Bottle Holder Sampling Method**
 - If sufficient flow is observed coming from a pipe that enters the manhole above the bottom, and there is enough room to do so, a sample bottle holder may be attached to the end of a telescopic rod. Telescopic sampling poles and bottle holding hardware are available from many environmental sampling supply companies.

- Lower the bottle beneath the flowing pipe and fill with sample. As noted above, do not overflow the bottle and avoid introducing sediment and debris to the sample.
 - Carefully bring the bottle back to the surface, replace cap, and store as above.
- **Syringe Method**
- If a pipe enters the manhole at or near the bottom, or if sampling a pipe using the Bottle Holder Sampling Method is not practical, then the Syringe method may be used. See Appendix E, Fig1.
- Secure a light string such as masons twine to the plunger of a sterile, disposable plastic syringe and secure the barrel of the syringe to the end of a telescoping extension rod with heavy-duty tape (duct tape works best). A photo of this sampler is provided in Appendix E.
 - While holding the string, extend the telescopic rod until the tip of the syringe enters the flow. To avoid introducing sediment into the sample and clogging the tip of the syringe, hold the tip of the syringe above the bottom of the pipe.
 - Gently pull the string until the plunger of the syringe is fully extended and the barrel is full of sample.
 - Bring the syringe full of sample back to the surface and fill the appropriate sample bottle(s).
 - Repeat as necessary until all the sample bottles have been filled.
 - Discard used syringe and store filled sample bottles as above.

Complete a chain of custody form for all samples prior to delivery to the lab.

Field Testing

Temperature and pH are measured in the field immediately after the collection of a sample with a calibrated thermometer and pH pen. The calibration methods are located in Appendix B. The results are recorded in the field database.

Laboratory Testing

Prepared sample bottles from the laboratories are to be picked up prior to the screening activities. Water samples will be collected for both the chemical parameter tests and the microbiology tests, where possible, and sent to the respective laboratories for analysis. Samples should arrive at the testing lab in a timely manner. Samples should be kept cool until delivered to the laboratory. This requires storing samples on ice on warm days. Microbiology tests have a hold time of 6

hours between the time when the sample is collected and when the sample needs to be at the laboratory. Due to the nature of this work, this hold time may need to be exceeded. The microbiology samples should be dropped off at the lab by the end of the day in which the samples were taken. All other samples are sent to the designated laboratory via overnight courier.

Table 1 summarizes the chemical parameters being tested and corresponding bottle characteristics. Refer to Appendix G for testing laboratory contact information. Upon receiving results, the data must be entered into the database.

Table 1 - Sample Parameter Information

Analyze	Test Method	Bottle Type/Size	Preservative	Hold Time
Ammonia	SM 2340C/ EPA 130.2	150 mL plastic	Sulfuric Acid (H ₂ SO ₄)	28 days
E. Coli	EPA 340.2/300	100 mL sterile plastic	Thiosulfate	6 hours
Surfactant (Detergent)	SM 5540C	250 mL plastic	None	48 hours

Notes: All samples are grab samples.
All bottles are pre-prepared by the laboratory.

D.3 FLOW MEASUREMENTS

Dry weather flow rate measurements are intended to provide an estimate of the existing flow rate. Field crews should make an initial assessment regarding the level of effort required to estimate flows. If flow measurements require more than approximately 10 to 15 minutes to perform, note the flow depth, approximate velocity, and pipe size so that flow data can be calculated. Flow estimates should not become the primary focus of the dry weather field screening activities. Flow measurements should be performed only after a water quality grab sample has been collected to avoid disturbing bottom sediments. The results will be recorded in the screening form of the field database on Page 2 (See Appendix I).

Three methods are outlined for estimating dry weather flow rates at field screening points. These methods include (1) measuring the time it takes to fill a bucket; (2) measuring area and velocity, and calculating flow as the cross-sectional area times the average velocity; and (3) measuring the depth, width, and slope of the channel and calculating the flow based on Manning's equation.

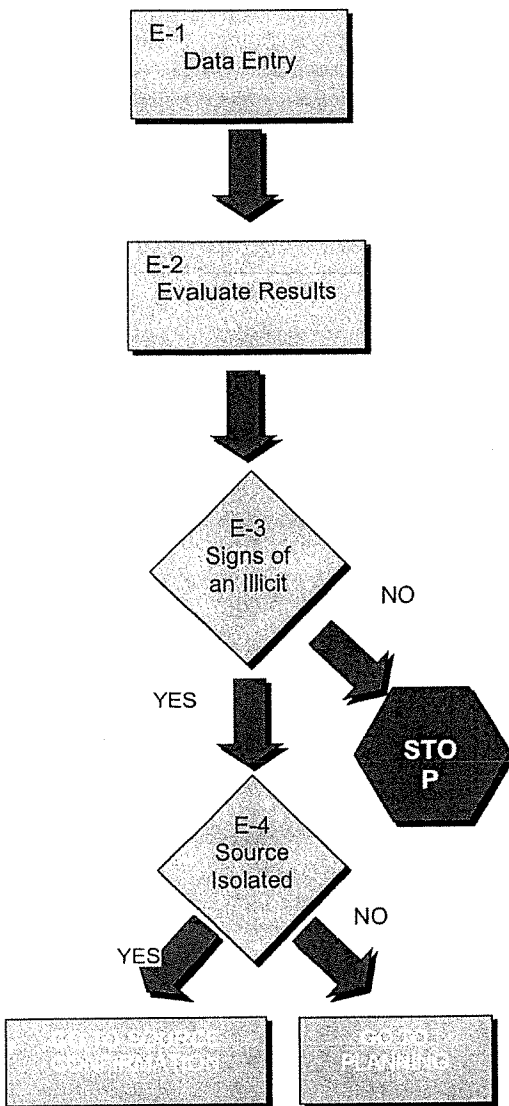
Information on calculating flow is found in Appendix F.

D.4 NOTIFICATION

If the source to an obvious illicit connection or discharge is known (i.e. sanitary line connected to the storm sewer system), follow the procedures outlined above to record the connection and immediately notify the municipality (see G. Notification section).

E. PHASE I AND PHASE II POST FIELDWORK

Figure 7 - Post Fieldwork Flow Chart



Post fieldwork is required for both the inventory phase and the screening phase fieldwork. The inventory phase post fieldwork primarily focuses on consolidating the data, identifying if any obvious illicit connections exist from observations recorded, and preparing a summary of those structures that need to be investigated in the screening phase.

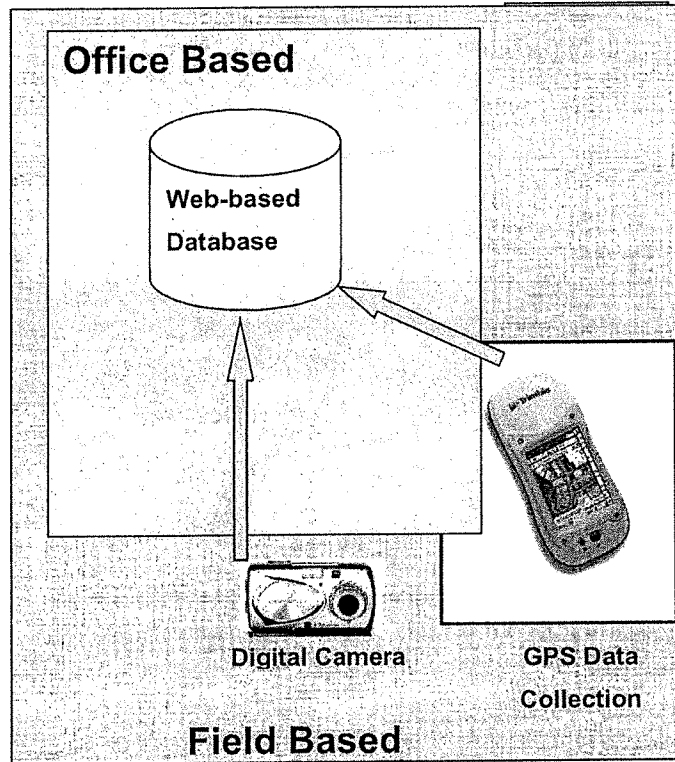
The post fieldwork for the screening phase includes consolidating the data, evaluating the laboratory and observation results, determining if follow-up work is needed, and identifying if an illicit connection is likely present.

E.1 DATA ENTRY

All inventory and screening information must be routinely entered into the web-based database. Data from fieldwork should be entered into the database as soon as is practical following fieldwork. Progress and data summary reports can be compiled from the database. See Figure 8.

Figure 8 - IDEP Data Management System

Illicit Discharge Elimination Data Management System



E.2 EVALUATE RESULTS

Once the laboratory analysis is completed, the results are compiled into the screening section of the database by going through the SQL edit. Once the results are documented, a determination can be made regarding the likelihood of an illicit connection or discharge. Figure 9 shows the parameter cut-off limits for the chemical parameters being tested indicating whether the sample results are out of the "normal" range.

Figure 9 - Parameter Cut-Off Limits

Parameter	Illicit Likely	Illicit Unlikely
Bacteriological (<i>E. Coli</i>)	>2500 colonies/100 ml	<2500 colonies/100 ml
Surfactants (Detergents)	>0.25 mg/l	<0.25 mg/l
Ammonia	>1.0 mg/l	<1.0 mg/l
Temperature	>72°	<45°
pH	>9.0	<6.0

Chemical parameters are only a portion of the decision in identifying the presence or absence of an illicit connection or discharge. The flow rate, visual observations, and the chemical results must all be considered.

Reporting a Suspected Illicit Discharge

If laboratory results and/or field observations indicate that an illicit discharge is likely and follow-up investigation to find the source is required, then a written report must be made to GCDC within 5 days. The report shall contain the outfall number where the suspected discharge was found, the location of the outfall, the laboratory results or observations that indicate a problem, and any other pertinent information that will be helpful in finding and removing the illicit discharge.

E.3 SIGNS OF AN ILLICIT?

Based on the results evaluation, if an illicit connection or discharge is likely present, then further work is needed to isolate the source. Dry weather flow and sediment must be investigated

further to confirm the source. A windshield survey should be conducted to locate potential sources of water and sediment throughout the drainage area. If excessive sediment is a significant issue, a catch basin survey should be conducted in addition to the windshield survey to try and track the source of the problem. If there is no indication of an illicit connection or discharge, then the appropriate results should be recorded by editing the record in the Access database.

E.4 SOURCE ISOLATED?

If the investigation results suggest that there is a potential illicit discharge within the drainage system, then follow-up investigations will be required. Tracking a potential illicit discharge through a sewer system is limited to the access points of the sewer system. Key points or confluences within the drainage area should be targeted and investigated using the methodology discussed in previous sections. The discharge point or outfall must be sampled each time the drainage system is visited and structures are investigated and sampled within it. Investigations should continue until the problem is isolated between one or two stretches of pipe. Once the source has been isolated to a specific reach, the task will become source confirmation.

Sound Testing

Sound testing can be used to quickly determine the pipe connectivity within an underground sewer system. This method relies on the ability of open piping to conduct sound over great distances and is especially efficient in large diameter pipes (e.g. 12 inch pipes or larger). While this testing method has limitations, it is a quick method for tracing piping upstream from an outfall to find the source of dry weather flow or an illicit discharge. Once the possible source of an illicit discharge is found, a dyed water test should be used to positively identify the location of the source.

To conduct a sewer connectivity sound test, proceed as follows:

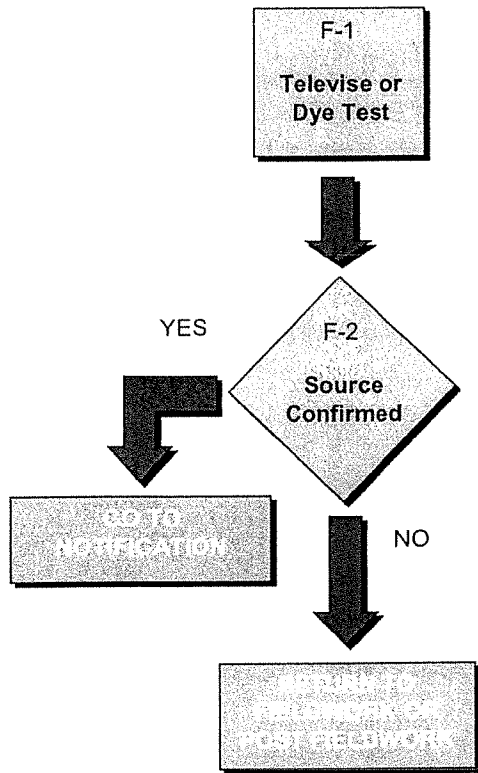
- Station one person (the listener) at the downstream outfall, catch basin, or manhole. If the downstream end is a manhole, remove the cover taking all appropriate safety measures. Position the listener so that they are in close proximity to the outfall pipe in question, or so they can listen directly over the manhole or catch basin.
- A second person (the striker) proceeds to the next upstream manhole or catch basin

and, using a light sledge hammer or similar device, strikes the structure with enough force so that the listener can hear the sound through the pipe system. To help eliminate background noise interference, the striker should hit the structure cover in a rhythmic fashion with a short, evenly spaced pause between strikes.

- An absence of sound between structures may mean that there is no connection between the structures. Bear in mind that underground pipes may be crushed or contain water or debris that prevents sound from travelling between two structures. A positive sound test may be bright and clear or, in some instances, faint and echoed depending on a number of factors including distance, pipe size, multiple connections, and compromised pipes.
- If a positive test is confirmed, repeat the process, if necessary, moving upstream through the system.

F. SOURCE CONFIRMATION

Figure 10 - Source Confirmation Flow Chart



F.1 TELEVISIONING AND DYE TESTING

An illicit connection can be connected directly into the manhole or can be connected into the system between manholes, where visual observations of the illicit connection cannot be made. In these instances, televising the storm sewer line may be utilized. This method is also valuable when access to private property is not available to conduct dye testing.

Dye testing should be utilized to confirm the source of an illicit connection. The building owners and/or tenants must be contacted to acquire available building plans and to set up an appointment to conduct the site visit. This notification should be coordinated through the municipality. A permit must be submitted to the MDEQ to obtain permission to dye test. Once the permit has been

approved, the MDEQ must be notified prior to all dye testing and only approved dyes may be used. Additional notifications to the local Health Department, Fire, and Police Departments may be required and should be coordinated through the local municipality.

F.2 SOURCE CONFIRMED

If the source is not confirmed, additional fieldwork or dye testing will be necessary. If the source is identified, refer to the notification procedure section.

G. NOTIFICATION

G.1 NOTIFICATION OF ADDITIONAL DISCHARGE POINTS AND OUTFALLS

Requirements

The general watershed-based storm water NPDES permit (Permit No. M1G619000) has the following requirements for notification of additional Discharge points and outfalls:

If the permittee becomes aware of any storm water drainage system discharges which were not identified in the application, the permittee shall provide the following information to the Department as part of the annual progress report (Part I.B.3.):

- a. the location of the discharge of storm water for which coverage is requested,*
- b. the receiving water for the discharge, and*
- c. any necessary updates to the map of the drainage area indicating the hydrologic boundary and approximate square miles of the coverage area (originally submitted with the application).*

These requirements can be satisfied by providing an updated map of the permittee's separate storm water drainage system.

G.2 NOTIFICATION OF ILLICIT DISCHARGES AND/OR CONNECTIONS

Requirements

Compliance with all requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

- a. 24 Hours Reporting – Any noncompliance which may endanger health or the environment (including daily maximum discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days.
- b. Other Reporting – The permittee shall report in writing all other instances of

noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: (1) a description of the discharge and cause of noncompliance; and (2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the step taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

G.3 REPORTING OTHER FIELD OBSERVATIONS

During IDEP investigation activities, notable deficiencies such as broken or failing infrastructure, field observations that are inconsistent with maps, or activities that compromise water quality may be noted by field staff. Any observations of this nature must be added to the screening comments on the IDEP field form and reported to GCDC in a timely manner.

If an activity is noted that is an immediate threat to public health such as a possible hazardous material spill or leak, call and report the incident to 911 and then contact GCDC and inform them of the situation. Activities that threaten water quality but are not an emergency should be reported to GCDC as soon as possible. These situations include dumping or leaking of garbage or pet waste, dumping lawn clippings or other yard waste into a drain or catch basin, disposing of oil, paint, or other materials into a storm sewer, or other violations of Stormwater Good Housekeeping Best Management Practices.

Damage to storm water infrastructure should also be noted and reported to GCDC. This includes damage to pipes, catch basins, manholes, etc. as well as erosion along a riparian buffer or around an outfall pipe. These observations should be included in weekly or bi-weekly updates to GCDC.

Appendix A
Supplies and Equipment

Example Field Equipment and Supplies List

- | | |
|----------------|--|
| Traffic Safety | <input type="checkbox"/> Arrow Board
<input type="checkbox"/> Traffic Cones
<input type="checkbox"/> Safety Vest
<input type="checkbox"/> Truck |
| Inventory | <input type="checkbox"/> Data forms, clipboard
<input type="checkbox"/> Handheld GPS with Differential Receiver
<input type="checkbox"/> Manhole hook
<input type="checkbox"/> Grade Rod
<input type="checkbox"/> Survey Tape
<input type="checkbox"/> Folding Ruler
<input type="checkbox"/> Sledge hammer
<input type="checkbox"/> Survey Wheel |
| Screening | <input type="checkbox"/> Stop Watch or a watch with a second hand
<input type="checkbox"/> Water Marking Paste
<input type="checkbox"/> Grade Rod Fitted for Sample Removal. Disposable syringes mounted to grade rod with pull string and duct tape
<input type="checkbox"/> Disposable 60 ml Syringes
<input type="checkbox"/> pH Pen
<input type="checkbox"/> Thermometer
<input type="checkbox"/> Sample bottles laboratory (automated partial chemistry)
<input type="checkbox"/> Sample bottles from Health Department (microbiology)
<input type="checkbox"/> Instrument Cleaning Supplies
<input type="checkbox"/> Cooler |
| Miscellaneous | <input type="checkbox"/> Camera, flash, film, 200 ASA color
<input type="checkbox"/> Mobile Phone and/or Pager
<input type="checkbox"/> Flash Light
<input type="checkbox"/> Mirror (for shining into manholes)
<input type="checkbox"/> Marking Paint, case
<input type="checkbox"/> Storm Drainage Maps
<input type="checkbox"/> Phone Numbers (office staff, emergency)
<input type="checkbox"/> Permit to work in MDOT ROW
<input type="checkbox"/> Business Cards and/or Field Badge
<input type="checkbox"/> Metal detector
<input type="checkbox"/> Spray paint
<input type="checkbox"/> Two spades/shovels
<input type="checkbox"/> Waders
<input type="checkbox"/> Fluorescent dye
<input type="checkbox"/> Corks, fish bobbers, etc.
<input type="checkbox"/> Pencils, pens, sharpener
<input type="checkbox"/> Daily field log to summarize activities
<input type="checkbox"/> Truck log
<input type="checkbox"/> Accident/ incident report form
<input type="checkbox"/> Insurance/registration
<input type="checkbox"/> Sunscreen and bug spray
<input type="checkbox"/> Antibacterial hand sanitizer (waterless)
<input type="checkbox"/> First Aid Kit |

Appendix B
pH Pen Calibration Instructions

pH

Pocket Pal pH Tester

Range: 0 – 14 pH units

Procedure

1. Turn on unit.
2. Remove protective cap from the bottom
3. Immerse the bottom of the Pocket Pal 1 to 3½ inches into the sample.
4. Using the Pocket Pal, gently stir the sample for several seconds. After stirring, and when the digital display stabilizes, read the pH value.
5. Rinse the bottom of the Pocket Pal and replace the protective cap.
6. For faster response and longer tester life, place several drops of DI water in the protective cap to prevent the glass bulb from drying out between uses.

Calibration

1. Prepare a pH 7.00 and a pH 4.00 or 10.00 buffer solution.
2. Measure the pH using the tester.
3. If necessary, adjust the Calibration Trimmer (small screws on back) until the reading corresponds to the pH of the buffer.

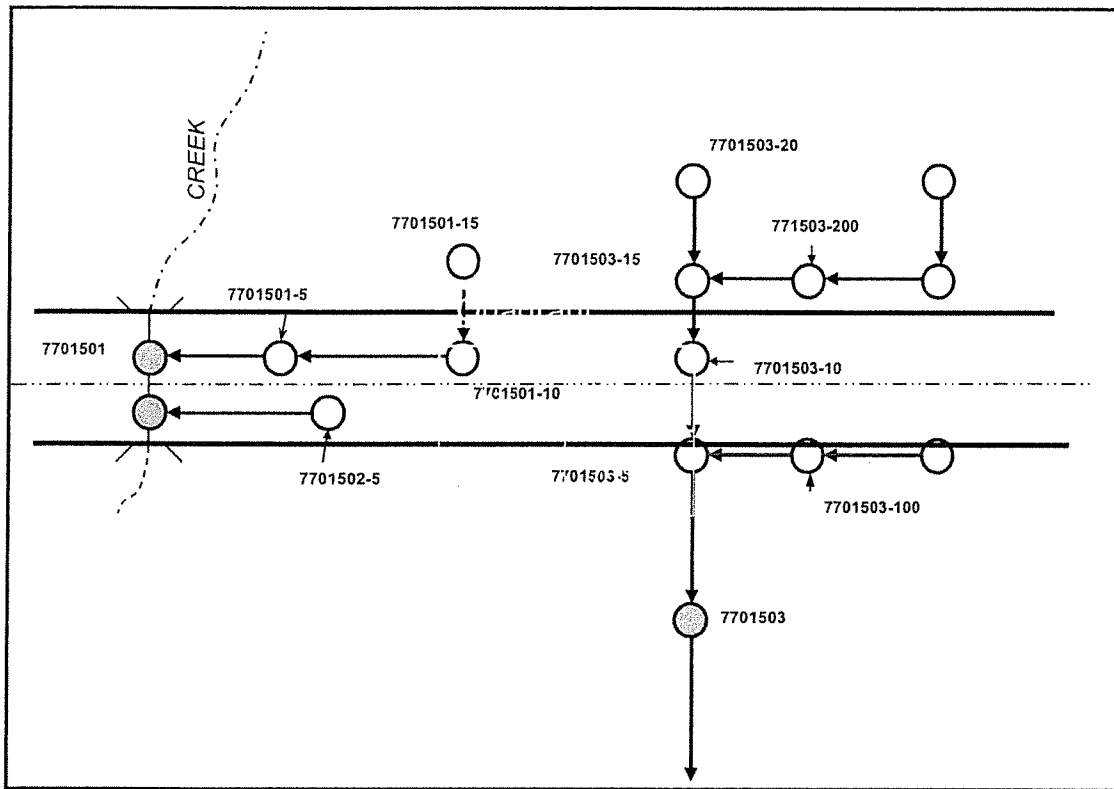
Notes

- Soak the electrode tip in tap water for a few minutes each week to condition the electrode.
- If pH readings become erratic, replace the batteries.
- Potassium chloride, used as a reference solution electrolyte, may deposit on the tester as a white precipitate. Although the precipitate is normal and does not affect performance, it may be removed with a damp cloth or tissue.

Table B-1 Calibration Log

[illegible]

Appendix C
Structure Numbering



ID Number Key

Example ID --

Township 7 7 01 501
 ↑ ↑ ↑ ↑
 Range Section Quadrant

Quadrant Key

1-250	251-500
501-750	751-999

Appendix D
MDEQ Fact Sheets

Appendix E
Sampling Devices

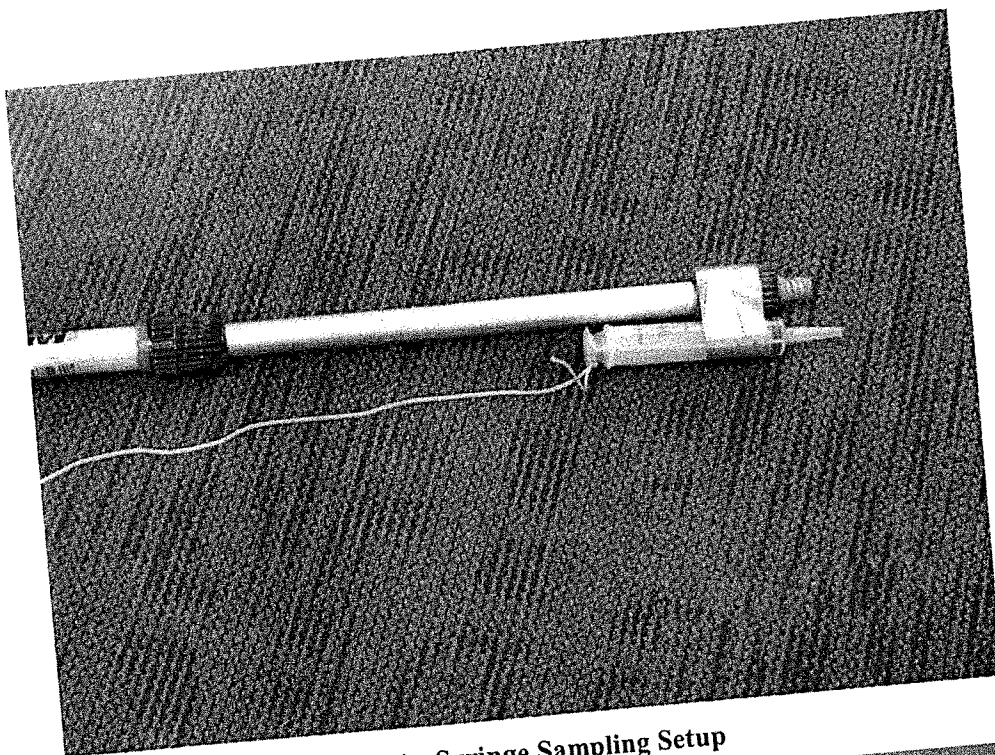


Fig 1 - Syringe Sampling Setup

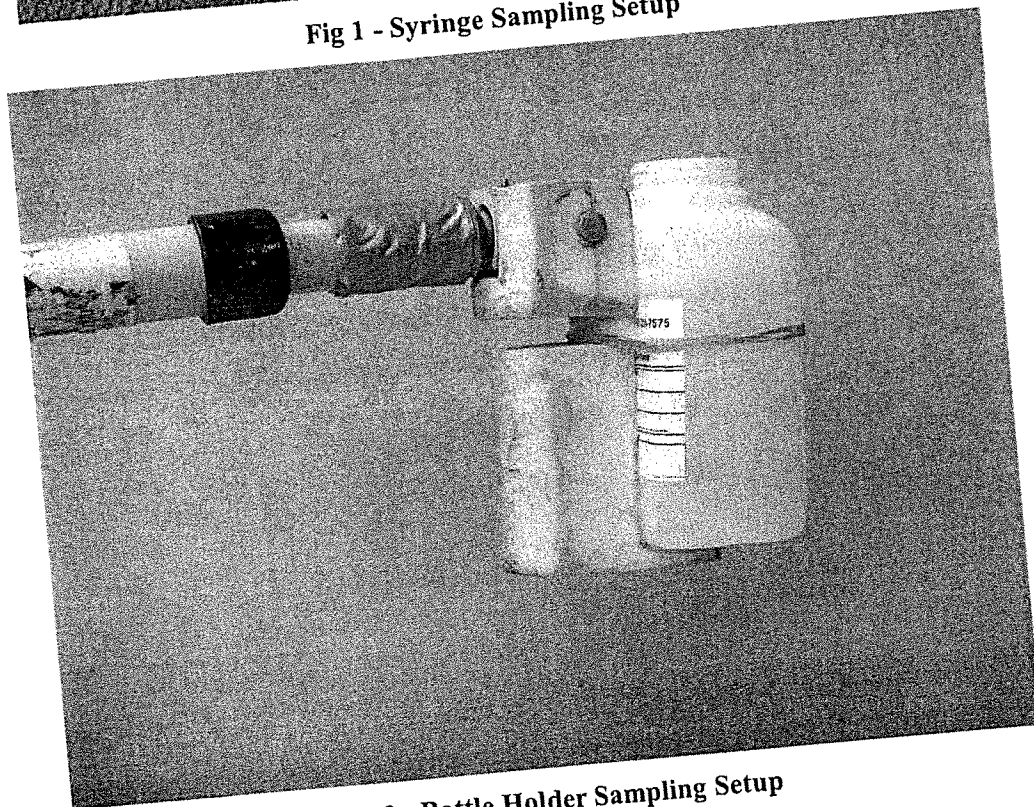


Fig 2 - Bottle Holder Sampling Setup

Appendix F
Flow Measurement Methods

Bucket Method

This method is typically limited to locations where there is free fall of water at the discharge point. The free fall must be high enough and concentrated along a narrow area so that a calibrated container can be positioned to collect all of the flow.

Equipment Needed:

1. Wide mouthed container(s) (bucket) graduated in known volume increments.
2. Stopwatch.

Procedure:

1. Place container under flow discharge point so that entire flow is collected.
2. Measure the time it takes to fill the bucket to a known volume.
3. Record the time duration and the volume.
4. Repeat Steps 1 through 3 at least once. Repeat steps at least twice, if the results vary by more than 20 percent.
5. Calculate the average time.
6. Compute the flow rate as follows: (Calculations to be done in the office).

$$Q = V/t$$

where:

Q = flow rate

V = volume

t = time required

7. Convert the calculated flow rate to liters per second.

Channel/Pipe Measurements

The second method for estimating flow requires channel measurements. The cross-sectional area of the flowing water and velocity must be estimated. This method should be used to estimate flow rates in pipes or channels where a significant, measurable, or steady velocity is observed and cross-sectional measurements can be readily obtained. The channel measurements can be fairly accurately measured for pipes of a known diameter. However, open channel measurements will generally rely on estimates of a top and bottom width. Velocity

measurements will be performed using floats and a stopwatch. Channel pipe flow calculations will be performed in the office.

Equipment Needed:

1. Depth Measurement Rod.
2. Tape Measure.
3. Float(s). These might include corks, fishing bobbers, wooden sticks, sticks and leaves, Cheerios, orange peel, or popcorn. If the float is not recoverable, then only objects that are non-objectionable in streams should be used.
4. Stopwatch.

Procedure:

1. Locate a relatively uniform section of the channel/pipe between 3 to 10 feet long.
2. Mark off a known length of the channel/pipe using available objects, such as rocks or sticks. If the site is at a manhole the diameter (typically 4 feet) of the manhole can be used as the travel length. If the discharge point location is at the end of a pipe and is accessible, a yardstick can be placed into the pipe or measure the length of a pipe section with a tape measure or folding ruler.
3. Use the stopwatch to measure the time required in seconds for a float to travel the marked off distance. If conditions are windy, it is desirable to have a float that is partially submerged. The float can be inserted upstream and timed as it passes the starting point. If swirls or eddies are observed, or if the flow depth is not very deep, this technique may not be applicable.
4. Step No. 3 should be repeated at least twice. If the velocity measurements vary by more than 20 percent a fourth measurement should be performed. The measurements should be averaged after dropping any outliers.
5. Measurements to calculate the cross-sectional area of the discharge should be obtained. For flow in a pipe, measure the depth of flow and the size of the pipe (if the pipe is other than round, sufficient measurements are needed to fully describe the shape of the pipe). For flow in a natural channel, measure the depth of flow, the bottom width of the channel, and the width of the channel at the flow surface.

6. Calculate the cross-sectional area of the flow. Calculations are to be done in the office. The following equations or (for partially filled circular pipes) may be used.

Rectangular Pipes: area = width * depth

Trapezoidal Channels: area = (top width + bottom width)/2 * depth

Circular Pipes:

$$A = \frac{d^2}{4} (\Theta - \sin(\Theta) \cos(\Theta))$$

$$\Theta = \cos^{-1} \left(1 - \frac{2y}{d} \right)$$

where:

A = Area

d = diameter of pipe

y = depth of flow

7. Calculate the flow rate and express the result in units of liters per second. Calculations are to be done in the office.

$$\text{Flow} = \text{Area} * \text{Velocity}$$

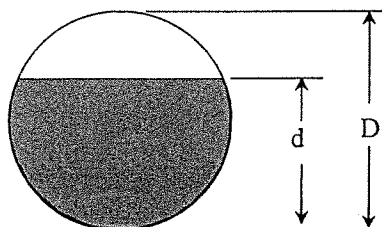
Table F-1 Area of Partial Filled Round Pipe

Diameter(in)	8	10	12	15	18	24	27	30	36	42	48	54	60
Diameter(ft)	0.67	0.83	1.0	1.3	1.5	2.0	2.3	2.5	3.0	3.5	4.0	4.5	5.0
Depth (ft)	Area (sf)												
0.05	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
0.10	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09
0.15	0.06	0.07	0.07	0.08	0.09	0.11	0.11	0.12	0.13	0.14	0.15	0.16	0.17
0.20	0.09	0.10	0.11	0.13	0.14	0.16	0.17	0.18	0.20	0.22	0.23	0.25	0.26
0.25	0.12	0.14	0.15	0.17	0.19	0.23	0.24	0.26	0.28	0.31	0.33	0.35	0.37
0.30	0.15	0.18	0.20	0.23	0.25	0.30	0.32	0.33	0.37	0.40	0.43	0.46	0.48
0.40	0.22	0.26	0.29	0.34	0.38	0.45	0.48	0.51	0.56	0.61	0.65	0.70	0.74
0.50	0.28	0.34	0.39	0.46	0.52	0.61	0.66	0.70	0.77	0.84	0.91	0.97	1.02
0.60	0.33	0.42	0.49	0.58	0.66	0.79	0.85	0.91	1.01	1.10	1.18	1.26	1.33
0.70		0.49	0.59	0.71	0.81	0.98	1.06	1.13	1.25	1.37	1.48	1.58	1.67
0.80		0.54	0.67	0.83	0.96	1.17	1.27	1.35	1.51	1.66	1.79	1.91	2.03
0.90			0.74	0.95	1.11	1.37	1.49	1.59	1.78	1.96	2.12	2.26	2.40
1.00			0.79	1.05	1.25	1.57	1.71	1.83	2.06	2.27	2.46	2.63	2.80
1.10				1.14	1.39	1.77	1.93	2.08	2.35	2.59	2.81	3.01	3.20
1.20				1.21	1.52	1.97	2.16	2.33	2.64	2.92	3.17	3.40	3.62
1.30					1.63	2.16	2.38	2.58	2.94	3.25	3.54	3.81	4.06
1.40					1.72	2.35	2.60	2.83	3.23	3.59	3.92	4.22	4.50
1.50					1.77	2.53	2.82	3.08	3.53	3.94	4.30	4.64	4.95
1.60						2.69	3.02	3.32	3.83	4.29	4.69	5.07	5.42
1.70						2.85	3.22	3.55	4.13	4.64	5.09	5.50	5.89
1.80						2.98	3.41	3.78	4.43	4.99	5.48	5.94	6.36
1.90						3.08	3.58	4.00	4.72	5.33	5.88	6.38	6.85
2.00						3.14	3.73	4.21	5.01	5.68	6.28	6.83	7.33
2.10							3.86	4.40	5.29	6.03	6.68	7.28	7.83
2.20							3.95	4.58	5.56	6.37	7.08	7.73	8.32
2.30								4.72	5.82	6.70	7.48	8.18	8.82
2.40								4.84	6.06	7.03	7.87	8.63	9.32
2.50								4.91	6.29	7.35	8.26	9.07	9.82
2.60									6.51	7.66	8.65	9.52	10.32
2.70									6.70	7.96	9.02	9.96	10.82
2.80									6.87	8.25	9.40	10.40	11.31

Diameter(in)	8	10	12	15	18	24	27	30	36	42	48	54	60
2.90									7.00	8.52	9.76	10.84	11.81
3.00									7.07	8.78	10.11	11.26	12.30
3.10										9.01	10.45	11.68	12.79
3.20										9.22	10.78	12.10	13.27
3.30										9.40	11.09	12.50	13.75
3.40										9.54	11.38	12.89	14.22
3.50										9.62	11.66	13.27	14.68
3.60											11.91	13.64	15.13
3.70											12.14	13.99	15.58
3.80											12.33	14.33	16.01
3.90											12.48	14.64	16.43
4.00											12.57	14.94	16.84
4.10												15.21	17.23
4.20												15.45	17.61
4.30												15.65	17.96
4.40												15.82	18.30
4.50												15.90	18.61
4.60													18.90
4.70													19.15
4.80													19.37
4.90													19.54
5.00													19.63

Table F-2 Area and Hydraulic Radius for Various Flow Depths

d/D	A/D ²	R/D	d/D	A/D ²	R/D	d/D	A/D ²	R/D
0.01	0.0013	0.0066	0.36	0.2546	0.1978	0.71	0.5964	0.2975
0.02	0.0037	0.0132	0.37	0.2642	0.2020	0.72	0.6054	0.2987
0.03	0.0069	0.0197	0.38	0.2739	0.2062	0.73	0.6143	0.2998
0.04	0.0105	0.0262	0.39	0.2836	0.2102	0.74	0.6231	0.3008
0.05	0.0147	0.0326	0.40	0.2934	0.2142	0.75	0.6319	0.3017
0.06	0.0192	0.0389	0.41	0.3032	0.2182	0.76	0.6405	0.3024
0.07	0.0242	0.0451	0.42	0.3130	0.2220	0.77	0.6489	0.3031
0.08	0.0294	0.0513	0.43	0.3229	0.2258	0.78	0.6573	0.3036
0.09	0.0350	0.0575	0.44	0.3328	0.2295	0.79	0.6655	0.3039
0.10	0.0409	0.0635	0.45	0.3428	0.2331	0.80	0.6736	0.3042
0.11	0.0470	0.0695	0.46	0.3527	0.2366	0.81	0.6815	0.3043
0.12	0.0534	0.0755	0.47	0.3627	0.2401	0.82	0.6893	0.3043
0.13	0.0600	0.0813	0.48	0.3727	0.2435	0.83	0.6969	0.3041
0.14	0.0668	0.0871	0.49	0.3827	0.2468	0.84	0.7043	0.3038
0.15	0.0739	0.0929	0.50	0.3927	0.2500	0.85	0.7115	0.3033
0.16	0.0811	0.0986	0.51	0.4027	0.2531	0.86	0.7186	0.3026
0.17	0.0885	0.1042	0.52	0.4127	0.2562	0.87	0.7254	0.3018
0.18	0.0961	0.1097	0.53	0.4227	0.2592	0.88	0.7320	0.3007
0.19	0.1039	0.1152	0.54	0.4327	0.2621	0.89	0.7384	0.2995
0.20	0.1118	0.1206	0.55	0.4426	0.2649	0.90	0.7445	0.2980
0.21	0.1199	0.1259	0.56	0.4526	0.2676	0.91	0.7504	0.2963
0.22	0.1281	0.1312	0.57	0.4625	0.2703	0.92	0.7560	0.2944
0.23	0.1365	0.1364	0.58	0.4724	0.2728	0.93	0.7612	0.2921
0.24	0.1449	0.1416	0.59	0.4822	0.2753	0.94	0.7662	0.2895
0.25	0.1535	0.1466	0.60	0.4920	0.2776	0.95	0.7707	0.2865
0.26	0.1623	0.1516	0.61	0.5018	0.2799	0.96	0.7749	0.2829
0.27	0.1711	0.1566	0.62	0.5115	0.2821	0.97	0.7785	0.2787
0.28	0.1800	0.1614	0.63	0.5212	0.2842	0.98	0.7816	0.2735
0.29	0.1890	0.1662	0.64	0.5308	0.2862	0.99	0.7841	0.2666
0.30	0.1982	0.1709	0.65	0.5404	0.2881	1.00	0.7854	0.2500
0.31	0.2074	0.1756	0.66	0.5499	0.2900			
0.32	0.2167	0.1802	0.67	0.5594	0.2917			
0.33	0.2260	0.1847	0.68	0.5687	0.2933			
0.34	0.2355	0.1891	0.69	0.5780	0.2948			
0.35	0.2450	0.1935	0.70	0.5872	0.2962			



Manning's Equation

Manning's equation can be used under certain circumstances to provide an estimate of the flow rate without velocity measurements. Manning's equation requires measurements of the channel cross-section, depth of flow, and slope of the channel, and a roughness coefficient, n , must be estimated. Manning's equation should only be used where the cross-section of the channel or pipe is uniform, the slope and roughness of the channel can be estimated, where measurements are taken at the upstream end of a uniformly sloping channel and where flow discharges freely with no backwater or impoundment due to a downstream condition. Slope of the channel should either be taken off as-builts or should be surveyed.

Equipment Needed:

1. Tape measure and/or depth measuring rod.

Procedure:

1. Measurements to calculate the cross-sectional area of the discharge should be obtained. For flow in a pipe, measure the depth of flow and the size of the pipe (if the pipe is other than round, sufficient measurements are needed to fully describe the shape of the pipe). For flow in a natural channel, measure the depth of flow, the bottom width of the channel, and the width of the channel at the flow surface.
2. Additional observations should include information to determine Manning's roughness coefficient. If possible, photographs should be taken of channel to help select the Manning roughness coefficients.
3. Calculate flows using the Manning equation. All calculations are to be done in the office. The Manning equation is:

$$Q = \frac{C1}{n} A^{(5/3)} P_w^{-(2/3)} \sqrt{S}$$

Rectangular Channels

$$A = by$$

$$P_w = b + 2y$$

Trapezoidal Channels

$$A = \frac{y(b+B)}{2}$$

$$P_w = b + 2\sqrt{y^2 + \left(\frac{B-b}{2}\right)^2}$$

Circular Channels

$$A = \frac{d^2}{4}(\Theta - \sin(\Theta)\cos(\Theta))$$

$$P_w = \Theta d$$

$$\Theta = \cos^{-1}\left(1 - \frac{2y}{d}\right)$$

where:

Q = flow (cms)

c1 = 1.0 for cms; 1.49 for cfs.

n = Manning's roughness coefficient

A = Area (square feet)

P_w = Wetted Perimeter (ft)

S = Channel Slope (ft/ft)

y = depth of water (ft)

d = diameter (ft)

b = bottom width (ft)

B = top width (width at water surface) (ft)

Table F-3 Typical Manning's Roughness Coefficient Values

Description	n
A. Closed Conduits Flowing Partly Full	
Cast Iron	
Coated	0.013
Uncoated	0.014
Corrugated Metal	
Subdrain	0.019
Storm drain	0.024
Concrete	
Culvert	0.013
Sewer	0.014
Clay	
Vitrified sewer	0.013
B. Lined or Built-up Channels	
Concrete	
Trowel Finish	0.013
Float Finish	0.015
Finished, with gravel on bottom	0.017
Unfinished	0.017
Concrete bottom float finished with sides of	
Dressed stone in mortar	0.017
Random stone in mortar	0.020
Cement rubble masonry	0.025
Gravel bottom with sides of	
Formed concrete	0.020
Random stone in mortar	0.023
Dry rubble or rip-rap	0.033
Asphalt	
Smooth	0.013
Rough	0.016
C. Excavated or Dredged	
Earth, straight and uniform	
Clean, recently completed	0.018
Clean, after weathering	0.022
Gravel, uniform section, clean	0.025
With short grass, few weeds	0.027
Earth, winding and sluggish	
No vegetation	0.025
Grass, some weeds	0.030
Dense weeds or aquatic plants in deep channels	0.035
Earth bottom and rubble sides	0.030
Stony bottom and weedy banks	0.035
Cobble bottom and clean sides	0.040
Channels not maintained, weeds and brush uncut	
Dense weeds, high as flow depth	0.080
Clean bottom, brush on sides	0.050

* Source: Open-Channel Hydraulics by Ven Te Chow, Ph.D. 1959

Appendix G
Contact Information

The following contact information is offered for this project.

Table G-1 Tetra Tech Contact Information

Name	Contact Information	Responsibilities
Steve Pennington	Tetra Tech 401 S. Washington Sq. Suite 100 Lansing, MI 48933 Office: (517) 316-3958 Cell: (517) 204-9232	Project Manager
Natalie Trotter	Tetra Tech 401 S. Washington Sq. Suite 100 Lansing, MI 48933 Office: (517) 316-3947	Technical Assistance
Robert Domm	Tetra Tech 401 S. Washington Sq. Suite 100 Lansing, MI 48933 Office: (517) 316-3943 Cell: (734) 891-4250	Technical Assistance

Table G-2 Laboratory Contact Information

Laboratory Name	Address	Telephone
MDEQ Drinking Water Laboratory	3350 N. Martin Luther King Blvd Lansing, MI 48909	(517) 335-8184
Brighton Analytical LLC	2105 Pless Drive Brighton, MI 48114	(810) 229-7575

Appendix H

MSDS

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name	Nitric Acid	Product Code	NX0409
Manufacturer	EM Science A Division of EM Industries P.O. Box 70 480 Democrat Road Gibbstown, N.J. 08027	Effective Date	3/22/2002
For More Information Call	856-423-6300 Technical Service Monday-Friday: 8:00 AM - 5:00 PM	In Case of Emergency Call	800-424-9300 CHEMTREC (USA) 613-996-6666 CANUTEC (Canada) 24 Hours/Day: 7 Days/Week
Synonym	None.		
Material Uses	Laboratory Reagent		
Chemical Family	Inorganic acid.		

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight
NITRIC ACID	7697-37-2	100

+ Section 3. Hazards Identification

Physical State and Appearance	Liquid. (Yellowish.)
Emergency Overview	DANGER! POISON! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING. MAY BE FATAL IF INHALED OR SWALLOWED. CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS. CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, MUCOUS MEMBRANES, RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA, TEETH.
Routes of Entry	Absorbed through skin. Inhalation. Ingestion.

Potential Acute Health Effects

Eyes	Hazardous in case of eye contact (corrosive). Causes eye burns.
Skin	Corrosive to skin on contact.
Inhalation	Extremely hazardous in case of inhalation (lung corrosive). Do not breathe vapor or mist. May be fatal if inhaled. Inhalation of vapors may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.
Ingestion	Extremely hazardous in case of ingestion. May be fatal if swallowed.

Potential Chronic Health Effects

Carcinogenic Effects	This material is not known to cause cancer in animals or humans.
----------------------	--

Additional information See Toxicological Information (section 11)

Medical Conditions	Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.
Aggravated by	Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Overexposure:	

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product	Non-flammable.
Auto-ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not available.
Products of Combustion	Not applicable.
Fire Hazards in Presence of Various Substances	Not applicable.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of static discharge: No. Risks of explosion of the product in presence of mechanical impact: No.

Fire Fighting Media and Instructions	Not applicable.
Protective Clothing (Fire)	Not applicable.
Special Remarks on Fire Hazards	Not available.
Special Remarks on Explosion Hazards	Not available.

Section 6. Accidental Release Measures

Small Spill and Leak	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill and Leak	Stop leak if without risk. Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Spill Kit Information	The following EM SCIENCE SpillSolv (TM) absorbent is recommended for this product: SX1310 Acid Treatment Kit

Section 7. Handling and Storage

Handling	Handle and open container with care. Avoid contact with combustible materials. Do not breathe vapor or mist. Do not ingest. Do not get in eyes, on skin or clothing. After handling, always wash hands thoroughly with soap and water.
Storage	Keep container tightly closed. Handle and open container with care. Keep container in a cool, well-ventilated area. Separate from acids, alkalis, reducing agents and combustibles.

+ Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	
Eyes	Face shield.
Body	Full suit.
Respiratory	Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Hands	Gloves.

Feet Boots.

Personal Protection in Case of a Large Spill Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name

Exposure Limits

NITRIC ACID

ACGIH (United States, 1994).

STEL: 10 mg/m³

STEL: 4 ppm

TWA: 5.2 mg/m³

TWA: 2 ppm

NIOSH REL (United States, 1994).

STEL: 10 mg/m³

STEL: 4 ppm

TWA: 5 mg/m³ Period: 10 hour(s).

TWA: 2 ppm Period: 10 hour(s).

OSHA Final Rule (United States, 1989).

STEL: 10 mg/m³

STEL: 4 ppm

TWA: 5 mg/m³

TWA: 2 ppm

National Authority for Occupational Safety/Health (Ireland, 1999).

STEL: 10 mg/m³

STEL: 4 ppm

OEL: 5 mg/m³

OEL: 2 ppm

+ Section 9. Physical and Chemical Properties

Odor ACRID; SUFFOCATING

Color Colorless to light yellow.

Physical State and Appearance Liquid. (Yellowish.)

Molecular Weight 63.02 g/mole

Molecular Formula H-N-O₃

pH Not available.

Boiling/Condensation Point 83.94°C (183.1°F)

Melting/Freezing Point -41.06°C (-41.9°F)

Teratogenic Effects	Not available.
Mutagenic Effects	Not available.

+ Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number	D002 D001
Treatment	Specified technology- Neutralize to pH 6-9. Contact your local permitted waste disposal site (TSD) for permissible treatments sites. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14. Transport Information

DOT Classification	Proper Shipping Name: NITRIC ACID Hazard Class: 8 UN number: UN2031 Packing Group: II RQ: 1000 lbs. (453.6 kg)
TDG Classification	Not available.
IMO/IMDG Classification	Proper Shipping Name: NITRIC ACID Hazard Class: 8 UN number: UN2031 Packing Group: II RQ: 1000
ICAO/IATA Classification	Not available.

Section 15. Regulatory Information

U.S. Federal Regulations	TSCA 8(b) inventory: NITRIC ACID SARA 302/304/311/312 extremely hazardous substances: NITRIC ACID SARA 302/304 emergency planning and notification: NITRIC ACID
--------------------------	---

	SARA 302/304/311/312 hazardous chemicals: NITRIC ACID
	SARA 311/312 MSDS distribution - chemical inventory - hazard identification: NITRIC ACID: fire, reactive, immediate health hazard
	SARA 313 toxic chemical notification and release reporting: Nitric Acid
	Clean Water Act (CWA) 307: No products were found.
	Clean Water Act (CWA) 311: Nitric Acid
	Clean air act (CAA) 112 accidental release prevention: Nitric Acid
	Clean air act (CAA) 112 regulated flammable substances: No products were found.
	Clean air act (CAA) 112 regulated toxic substances: Nitric Acid
WHMIS (Canada)	<p>CLASS C: Oxidizing material.</p> <p>Class D-1B: Material causing immediate and serious toxic effects (TOXIC).</p> <p>CLASS E: Corrosive liquid.</p> <p>CEPA DSL: Nitric Acid</p> <p>This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.</p>
International Regulations	
EINECS	Nitric Acid 231-714-2
DSCL (EEC)	<p>R8- Contact with combustible material may cause fire.</p> <p>R35- Causes severe burns.</p>
International Lists	<p>Australia (NICNAS): Nitric Acid</p> <p>Japan (MITI): Nitric Acid</p> <p>Korea (TCCL): Nitric Acid</p> <p>Philippines (RA6969): Nitric Acid</p> <p>China: No products were found.</p>
State Regulations	<p>Pennsylvania RTK: Nitric Acid: (environmental hazard, generic environmental hazard)</p> <p>Massachusetts RTK: Nitric Acid</p> <p>New Jersey: Nitric Acid</p> <p>California prop. 65: No products were found.</p>

Section 16. Other Information

	National Fire	Health	0	Fire Hazard
	Protection		4OXY1	Reactivity
	Association			Specific Hazard
	(U.S.A.)			
Changed Since Last Revision	+			

Notice to Reader

The statements contained herein are based upon technical data that EM Industries believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EM INDUSTRIES MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

Material Safety Data Sheet

+ Section 1. Product and Company Identification

Product Name	Sulfuric Acid, GR	Product Code	SX1244
Manufacturer	EM Science A Division of EM Industries P.O. Box 70 480 Democrat Road Gibbstown, N.J. 08027	Effective Date	11/27/2001
For More Information Call	856-423-6300 Technical Service Monday-Friday: 8:00 AM - 5:00 PM	In Case of Emergency Call	800-424-9300 CHEMTREC (USA) 613-996-6666 CANUTEC (Canada) 24 Hours/Day: 7 Days/Week
Synonym	OIL OF VITRIOL		
Material Uses	Analytical reagent.		
Chemical Family	Acid.		

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight
SULFURIC ACID	7664-93-9	100

+ Section 3. Hazards Identification

Physical State and Appearance	Liquid. (Clear viscous liquid.)
Emergency Overview	DANGER! POISON! MAY BE FATAL IF INHALED OR SWALLOWED. CAUSES SEVERE EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT BURNS. OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, MUCOUS MEMBRANES,

	RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA, TEETH.
Routes of Entry	Absorbed through skin. Eye contact. Inhalation. Ingestion.
Potential Acute Health Effects	
Eyes	Extremely hazardous in case of eye contact (corrosive). Causes severe eye burns.
Skin	Extremely hazardous in case of skin contact (corrosive). Skin contact produces severe burns.
Inhalation	Extremely hazardous in case of inhalation. May be fatal if inhaled. Hazardous in case of inhalation (lung corrosive).
Ingestion	Extremely hazardous in case of ingestion. May be fatal if swallowed.
Potential Chronic Health Effects	
Carcinogenic Effects	Classified A2 (Suspected for human.) by ACGIH.
Additional information See Toxicological Information (section 11)	
Medical Conditions	Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.
Aggravated by	Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Overexposure:	

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product	Non-flammable.
Auto-ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.
Products of Combustion	Not available.
Fire Hazards in Presence of Various Substances	Flammable in presence of combustible materials
Explosion Hazards in	Risks of explosion of the product in presence of static discharge: No.

Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: No.
Fire Fighting Media and Instructions	Do not use water or foam.
Protective Clothing (Fire)	Wear MSHA/NIOSH approved self-contained breathing apparatus or equivalent and full protective gear.
Special Remarks on Fire Hazards	Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc.
Special Remarks on Explosion Hazards	Not available.

Section 6. Accidental Release Measures

Small Spill and Leak	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.
Large Spill and Leak	Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Spill Kit Information	The following EM SCIENCE Spillsolv (TM) absorbent is recommended for this product: SX1310 Acid Treatment Kit

+ Section 7. Handling and Storage

Handling	Store in tightly closed container. Avoid contact with combustible materials. Do not ingest. Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or spray mists.
Storage	Keep container in a cool, well-ventilated area. Separate from acids, alkalis, reducing agents and combustibles.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	
Eyes	Face shield.
Body	Full suit.
Respiratory	Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Hands	Gloves.
Feet	Boots.

Personal Protection in Case of a Large Spill Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name	Exposure Limits
---------------------	------------------------

SULFURIC ACID

AUVA (Austria, 1995).
 Spitzenbegrenzung: 2 mg/m³ 8 times per shift, Period: 5 minute(s).
 MAK: 1 mg/m³
 Belgium Minister of Labour (Belgium, 1998).
 VCD: 3 mg/m³
 VL: 1 mg/m³
 BAUA (Germany, 1997).
 Spitzenbegrenzung: 1 mg/m³
 MAK: 1 mg/m³
 DK-Arbejdstilsynet (Denmark, 1996).
 GV: 1 mg/m³
 Tyterveyslaitos (Finland, 1998).
 STEL: 3 mg/m³
 TWA: 1 mg/m³
 INRS (France, 1996).
 VLE: 3 mg/m³
 VME: 1 mg/m³
 National Authority for Occupational Safety/Health (Ireland, 1999).
 OEL: 1 mg/m³
 Arbeidsinspectie (Netherlands, 1999).
 TGG 8 uur: 1 mg/m³
 N-Arbeidstilsynet (Norway, 1996).
 AN: 1 mg/m³
 AFS (Sweden, 1996).
 KTV: 3 mg/m³
 NGV: 1 mg/m³
 EH40-OES (United Kingdom (UK), 1997).
 TWA: 1 mg/m³
 ACGIH (United States, 1996).
 STEL: 3 mg/m³
 TWA: 1 mg/m³
 NIOSH REL (United States, 1994).
 TWA: 1 mg/m³ Period: 10 hour(s).
 OSHA Final Rule (United States, 1989).
 TWA: 1 mg/m³

Section 9. Physical and Chemical Properties

Odor	Odorless.
Color	Colorless.
Physical State and Appearance	Liquid. (Clear viscous liquid.)
Molecular Weight	98.08 g/mole
Molecular Formula	H ₂ -O ₄ -S
pH	Acidic.
Boiling/Condensation Point	290.05°C (554.1°F)
Melting/Freezing Point	-10°C (14°F)
Specific Gravity	1.84 (Water = 1)
Vapor Pressure	0.1 kPa (1 mmHg) (@ 20°C)
Vapor Density	Not available.
Odor Threshold	>1 ppm
Evaporation Rate	<1
LogKow	Not available.
Solubility	Soluble in water.

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Extremely reactive or incompatible with reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.
Rem/Incompatibility	Not available.
Hazardous Decomposition Products	Not available.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

RTECS Number:

Sulfuric Acid

WS5600000

Toxicity

Acute oral toxicity (LD50): 2140 mg/kg [Rat].

Acute toxicity of the vapor (LC50): 320 mg/m³ 2 hour(s) [Mouse].

Chronic Effects on Humans	CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH.
Acute Effects on Humans	Extremely hazardous in case of eye contact (corrosive). Causes severe eye burns. Extremely hazardous in case of skin contact (corrosive). Skin contact produces severe burns. Extremely hazardous in case of inhalation. May be fatal if inhaled. Hazardous in case of inhalation (lung corrosive). Extremely hazardous in case of ingestion. May be fatal if swallowed.
Synergetic Products (Toxicologically)	Not available.
Irritancy	Draize Test (Rabbit): Eyes: 5 mg/30s. Reaction: Severe.
Sensitization	Not available.
Carcinogenic Effects	Classified A2 (Suspected for human.) by ACGIH.
Toxicity to Reproductive System	Tests on laboratory animals for reproductive effects are cited in Registry of Toxic Effects on Chemical Substances (RTECS).
Teratogenic Effects	Not available.
Mutagenic Effects	Tests on laboratory animals for mutagenic effects are cited in Registry of Toxic Effects of Chemical Substances (RTECS).

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number	D002
Treatment	Specified Technology - Neutralize to pH 6-9. Contact your local permitted waste disposal site (TSD) for permissible treatment sites. Always contact a permitted waste disposal (TSD) to assure compliance with all current local, state, and Federal Regulations.

Section 14. Transport Information

DOT Classification	Not available.
TDG Classification	Not available.
IMO/IMDG Classification	Not available.
ICAO/IATA Classification	Not available.

Section 15. Regulatory Information

U.S. Federal Regulations	TSCA 8(b) inventory: SULFURIC ACID
	SARA 302/304/311/312 extremely hazardous substances: SULFURIC ACID
	SARA 302/304 emergency planning and notification: SULFURIC ACID
	SARA 302/304/311/312 hazardous chemicals: SULFURIC ACID
	SARA 311/312 MSDS distribution - chemical inventory - hazard identification: SULFURIC ACID: reactive, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
	SARA 313 toxic chemical notification and release reporting: SULFURIC ACID
	Clean Water Act (CWA) 307: No products were found.
	Clean Water Act (CWA) 311: SULFURIC ACID
	Clean air act (CAA) 112 accidental release prevention: No products were found.
	Clean air act (CAA) 112 regulated flammable substances: No products were found.
WHMIS (Canada)	Clean air act (CAA) 112 regulated toxic substances: No products were found.
	CLASS C: Oxidizing material.
	Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
	CLASS E: Corrosive liquid.
International Regulations	CEPA DSL: SULFURIC ACID
	EINECS
	SULFURIC ACID 231-639-5
	DSCL (EEC)
	R35- Causes severe burns.
	International Lists
	Australia (NICNAS): SULFURIC ACID
	Japan (MITI): SULFURIC ACID
	Korea (TCCL): SULFURIC ACID
	Philippines (RA6969): SULFURIC ACID
State Regulations	China: No products were found.
	Pennsylvania RTK: SULFURIC ACID: (environmental hazard, generic environmental hazard)
	Massachusetts RTK: SULFURIC ACID
	New Jersey: SULFURIC ACID
	California prop. 65: No products were found.

Section 16. Other Information

National Fire Protection Association (U.S.A.)	Health	0	Fire Hazard	
		3	2	Reactivity
		W		
			Specific Hazard	

Changed Since Last +
Revision
Notice to Reader

The statements contained herein are based upon technical data that EM Industries believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EM INDUSTRIES MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

Appendix I
Paper Field Forms

DRAINAGE SYSTEM INVENTORY

GENERAL

Date _____ Time _____ ID _____
 Initial (1) _____ Initial (2): _____
 Photographs: Roll # _____ Picture #'s _____

STRUCTURE TYPE

- ☐ Discharging pipe
☐ Manhole
☐ Catch Basin
☐ Culvert Outlet
☐ Point in Open Channel
- ☐ Not Found
☐ Blind Tie or Tap
☐ Non-Point Source (circle below)
 • Seepage
 • Overland Flow

Ownership

- ☐ Public
☐ Private
☐ GCDC
- ☐ GCRC
☐ Other _____

LOCATION (see back side for location sketch)

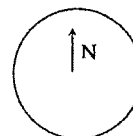
Latitude _____
 Longitude _____
 Offset Description: _____

Receiving Waterbody: _____

Inventory Comments: _____

CONDUIT INFORMATION

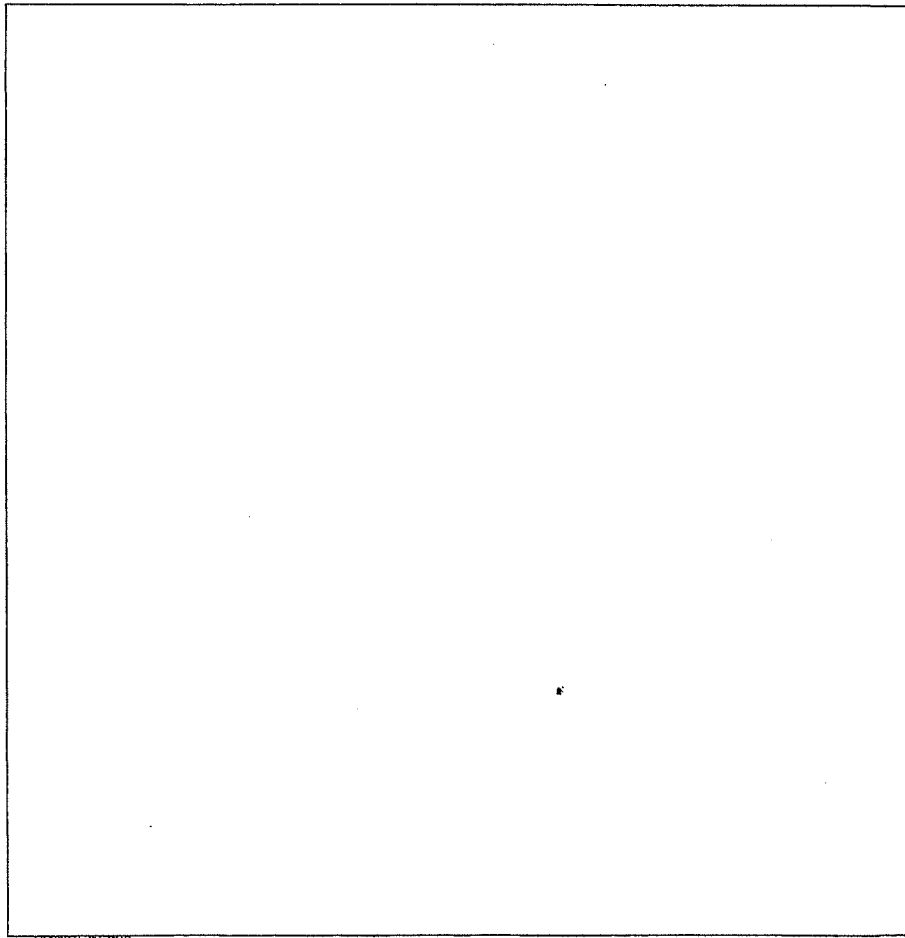
Pipe ID						
Direction from MH						
Shape						
Diameter (in)						
Width (in) (Open Channel)						
Depth (in)						
Measure Down (ft) (Manhole)						
Invert Elevation (ft) (Pipes)						
Conduit Material						
Inlet/Outlet						



LOCATION SKETCH

LOCATION SKETCH CHECK LIST

- ☐ Label Street Names
- ☐ Indicate North
- ☐ Locate manholes by dimensions from property lines, back of curb, or edge of pavement
- ☐ Sketch catch basins and connections (no measurements necessary).
- ☐ Indicate (if possible) distance to upstream and downstream manholes
- ☐ Landmarks/nearest address, if any
- ☐ Flow direction
- ☐ Sample point
- ☐ Special access/traffic control notes
- ☐ Between mile markers _____ & _____ or _____ tenths past mile marker _____
- ☐ Velocity/depth measure location



Updated 5-15-00

DRAINAGE SYSTEM SCREENING

GENERAL

Date _____

Time _____

ID _____

Air Temp _____

Rain ☐ Yes ☐ No

☐ Clear/Sunny

☐ Partly Cloudy

☐ Overcast

Crew Initials _____

Chk By: _____

Photographs: Roll # _____

Picture # _____

DRY WEATHER FLOW PRESENT

☐ Yes, Dry Weather Flow Present

☐ Trace, Insufficient

☐ No Dry Weather Flow Present

☐ Standing Water

☐ Submerge

☐ Inundated

☐ N/A

FLOW MEASUREMENTS

Pipe Sampled: Size (in) _____ Direction _____

Method: ☐ Tt Method

☐ Area * Velocity

☐ Bucket

☐ Manning's

General Data

Depth, (in) _____

Dist Traveled, (ft) _____

Bucket Vol, (l) _____

Channel Slope (%) _____

Channel Material _____

Channel, n _____

Travel

Time Trials

#1 (sec) _____

#2 (sec) _____

#3 (sec) _____

Avg (sec) _____

Vel (fps) _____

Flow: _____

Intermittent ☐ Not Checked

Flow Check ☐ Left Sand Bag in Channel

☐ Removed Sand Bag, intermittent DWF present ☐ Yes ☐ No

if possible describe frequency, duration, time of day of flow slugs - put in comments section

DISCHARGE OBSERVATIONS (if "other" checked fill in description at bottom of page)

Odor ☐ None ☐ Musty ☐ Sewage ☐ Rotten ☐ Gas ☐ Oil ☐ Other

Floatables ☐ None ☐ Trash ☐ Sewage ☐ Bacterial ☐ Oil Sheen ☐ Suds ☐ Other

Deposits/ ☐ None ☐ Mineral ☐ Sediment ☐ Oily ☐ Grease ☐ Suds ☐ Other

Stains ☐ Normal ☐ Excessive ☐ Algae ☐ Slime ☐ Other

Vegetation ☐ Normal ☐ Cracking ☐ Spalling ☐ Corrosion ☐ Settlement ☐ Staining ☐ Other

Structural ☐ Normal ☐ Cracking ☐ Spalling ☐ Corrosion ☐ Settlement ☐ Staining ☐ Other

Color _____ Enter # _____

Turbidity _____ Enter # _____

Description:

RECEIVING WATER OBSERVATIONS (if "other" checked fill in description at bottom of page)

Odor	<input type="checkbox"/> None	<input type="checkbox"/> Musty	<input type="checkbox"/> Sewage	<input type="checkbox"/> Rotten Egg	<input type="checkbox"/> Gas	<input type="checkbox"/> Oil	<input type="checkbox"/> Other
Floatables	<input type="checkbox"/> None	<input type="checkbox"/> Trash	<input type="checkbox"/> Sewage	<input type="checkbox"/> Bacterial Sheen	<input type="checkbox"/> Oil Sheen	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Deposits/ Stains	<input type="checkbox"/> None	<input type="checkbox"/> Mineral	<input type="checkbox"/> Sediment	<input type="checkbox"/> Oily	<input type="checkbox"/> Grease	<input type="checkbox"/> Suds	<input type="checkbox"/> Other
Vegetation	<input type="checkbox"/> None	<input type="checkbox"/> Normal	<input type="checkbox"/> Excessive	<input type="checkbox"/> Algae	<input type="checkbox"/> Slime		<input type="checkbox"/> Other
Bank	<input type="checkbox"/> Excessive Vegetation	<input type="checkbox"/> Staining of Banks	<input type="checkbox"/> Erosion	<input type="checkbox"/> Trash			<input type="checkbox"/> Other
Color	_____ Enter #						
Turbidity	_____ Enter #						

Description:

DRAINAGE SYSTEM SCREENING (Continued)

ID

CHEMICAL ANALYSIS

FIELD ANALYSIS

LAB SAMPLE COLLECTED ID _____

Surfactants	_____ mg/L	Temperature	_____
Ammonia	_____ mg/L	pH	_____
Boron	_____ mg/L	Specific Cond.	_____
Potassium	_____ mg/L		
E. Coli	_____ per 100ml		

RESULTS

- ☐ Illicit Connection Ruled Out
- ☐ Illicit Connection (undocumented connection)
- ☐ Pending
- ☐ Notify City
- ☐ Not a PSD

ACTION

- ☐ None Required
- ☐ Illicit Removed
- ☐ Waiting on Lab Results
- ☐ Dye Test
- ☐ Televis
- ☐ Investigate Further
- ☐ Illicit Connection

Comments

Appendix J
Genesee IDEP SOP

Standard Operating Procedure for:

**Genesee County
Illicit Discharge Elimination Program**

Purpose of SOP:

To obtain and record inventory information for outfalls including construction material, size, Global Positioning System (GPS) location. To conduct field screening of Outfalls to schedule, report, track and enforce the Elimination of illicit discharges. To perform a round of dry-weather screening of county outfalls every 5 years and to track the effectiveness of the IDEP program. To track the disconnection of illicit discharges.

Procedures/Practices:

Suggested Frequency:

Field Screening and Inventory of Existing Outfalls

5 years

- Conduct a field screening and inventory of all existing county outfalls. Outfalls should only be screened in dry weather. (E.g. 72 hours after the last rainfall event that produced more than 0.1 inches of rainfall.)
- Perform a dry-weather screening of each outfall noting dry weather flow, pipe size and material, direction of pipe from manhole, date and time of inspection and GPS location within 1 meter. Note any visual indications of an illicit discharge. Use the IDEP Field Screening and Inventory Form that is included at end of this SOP.
- Take a digital photograph of the outfall pipe or manhole showing the structure and its immediate surroundings.
- Collect sample of any dry weather flow and test for Ammonia, Surfactant, E. coli, pH, and Temperature.
- Conduct a follow-up, upstream investigation on outfalls that fall outside of chemical testing parameters: Ammonia >1Mg/L; Surfactant >0.2Mg/L; E. coli >2000 colonies/100ml; Temperature > ambient air temperature; pH >9 or <6.

Procedures/Practices:

Suggested Frequency:

Field Screening and Inventory of Existing Outfalls



Dry Weather Flow



Outfall Sampling

- Conduct a follow-up, upstream investigation on any outfall that exhibits visual or physical signs of sewage contamination (Smell, sewage bacteria, sanitary debris).
- Watch for discharges from Sanitary Sewer Overflows (SSO) and non-point-source discharges and record them on the IDEP Field Screening and Inventory Form.
- Train field personnel to spot, identify, and report suspected illicit discharges.

Immediately

Annually

Upstream Tracking and Discharge Verification

- Trace the suspected illicit discharge upstream through the storm sewer system, sampling any flowing input pipes along the way.
- Try to isolate any suspected illicit discharge to a single stretch of sewer or discrete location.
- Dye test suspected illicit discharge sources (toilets, sinks, sump drains, floor drains, etc.) to isolate the source.

Immediately

As soon as practical

Reporting of Illicit Discharges

- Report verbally to MDEQ within 24 hours of time an illicit discharge is confirmed.

24 hours

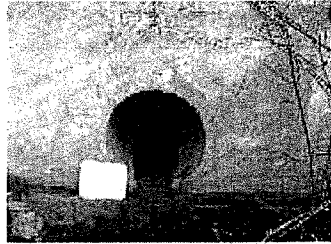
Procedures/Practices:

Suggested Frequency:

Field Screening and Inventory of Existing Outfalls

- Report in writing within 5 days from the time the illicit discharge is confirmed. Include a description of the discharge and cause of noncompliance, the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the discharge.

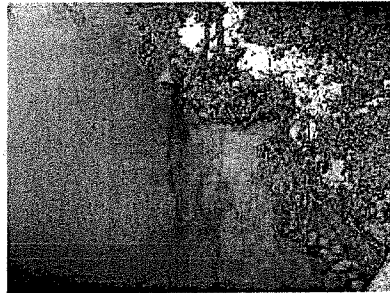
5 days



Outfall Documentation



Sewage Stain



Positive Dye Test

Field Screening and Inventory of New Outfalls

- Conduct a dry-weather screening and inventory of new outfalls created using the IDEP Field Screening and Inventory Form.
- Perform a dry-weather screening for each new outfall noting dry weather flow, pipe size and material, direction of pipe from manhole,

Ongoing

Procedures/Practices:

Suggested Frequency:

Field Screening and Inventory of Existing Outfalls

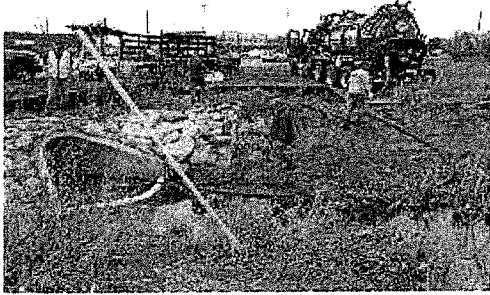
depth of pipe invert relative to manhole rim (if applicable), date and time of inspection and GPS location within 1 meter. Note any visual indications of an illicit discharge. Use the IDEP Field Screening and Inventory Form that is included at end of this SOP.

- Take a digital photograph of the outfall pipe or manhole showing the structure and its immediate surroundings.
- Enter Data from Screening and inventory in the Genesee County IDEP data base.

Tracking and Reporting

- Document the date, time, and screening results of existing outfalls as they are visited. Enter these results in the IDEP database.
- Track the location and resolution of all illicit discharges in the IDEP database. Document upstream follow up investigations including results for any dye testing or sewer TV work.
- Provide documentation of the actions taken to eliminate illicit discharges to MDEQ.
- For significant illicit discharges, provide MDEQ with a list of the pollutants of concern, estimate of the volume and load discharged, and provide locations of the discharges into both the separate storm water sewer system and the receiving water body.
- Report new outfalls to MDEQ.

Ongoing



Emergency Spill

Emergency Spill Response

- In the event the spill or release poses a threat to public safety, call 9-1-1 immediately.
- Report spills or accidental releases immediately to the MDEQ Pollution Emergency Alerting System (PEAS) 24-hour hotline at 1-800-292-4706.
- Within 10 days of the spill or release, submit to the MDEQ a full written explanation as to the cause; discovery, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

Immediate

Appendix K
Vienna Township Illicit Discharge Response Plan

Vienna Township Illicit Discharge Response Plan

The following table represents a schedule of events from when an illicit discharge, spill or illegal dumping is first reported until it is resolved and enforcement action is taken.

Step Number	Timeframe	Description
1	Day 1	Complaint of an illicit discharge, spill or illegal dumping is received at Vienna Township
2	1 to 2 Business Days	A Vienna Township code enforcement officer will investigate complaint and log the complaint and investigation results
3	24 to 48 hours	If a violation is found, code enforcement officer will contact the appropriate agency to report the discharge, spill or illegal dumping
4	Within 72 hours	Code enforcement will meet with the appropriate agency on site to develop a proper remediation plan
5	Varies	Dependent upon incident type and severity, remediation/repair of said incident will begin as soon as possible but time frame for completion will vary dependent upon what needs to be done
6	Within 10 Business Days	Once the site has been remediated, Code Enforcement officer may issue a ticket/fine or other enforcement action may be taken