2011

Revised 2015, 2018, 2020

Guidelines and Standard Operating Procedures

Chapter 1

I. INTRODUCTION

The Introduction section describes the regulatory basis, overall organization, and intended audience of the Manual.

2.1 BASIS FOR THE MANUAL

In October 2001, The Alabama Department of Management (ADEM) in accordance with the Environmental Protection Agency (EPA) issued a National Pollutant Discharge Elimination System (NPDES) for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s).

The regulation specifies that a new general permit be issued by ADEM on a revolving five year basis. The General permit is valid until the new permit is issued and requires each municipality to develop a five year plan to:

> *"..(R)educe the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards."*

This Manual will provide a standardization that incorporates a commonly accepted framework, technical standards, and guidance on stormwater management measures that control the quantity and quality of stormwater produced from common municipal activities. This Manual will aid in helping communities' Illicit Discharge Detection and Elimination (IDDE) program and provide a basis for future employee training

This Manual will not only provide assistance to municipalities to meet the Stormwater Phase II regulations, but encourages them to use targeted best management practices (BMPs) within the watershed with the long-term goal of consistent application by all regulated entities within the watershed. The Manual of Guidelines and Standard Operating Procedures ("The Manual")will help promote improvement in the water quality of Leed's lakes, ponds, streams, and rivers.

2.2 OBJECTIVES OF THE MANUAL

The specific objectives of the Manual are to

- Provide a uniform set of technical standards and guidance on stormwater management measures that will control both the quantity and quality of stormwater produced by municipal activities, new development, redevelopment, and post-construction;
- Assist municipalities in meeting Stormwater Phase II requirements;

- Encourage the use of uniform BMP strategies with the long term goal of consistent application by all regulated entities within the watershed;
- Encourage municipal cost-savings through proper and timely maintenance of stormwater systems; and
- Promote behavior that will improve the water quality throughout Jefferson County

2.3 CONTENT OF THE MANUAL

The content of this Manual is based primarily on the select requirements of the Stormwater Phase II program. The five year plan for each community must address the following control measures:

1. Public Education and Outreach on Stormwater Impacts
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination (IDDE)
4. Industrial Inspection Program
5. Construction Site Stormwater Runoff Control
6. Post-Construction Stormwater Management in New Development and Redevelopment
7. Pollution Prevention/Good Housekeeping for municipal operations
8. Promotion of Green Development
9. Roadway Procedures
10. Pesticide, Herbicide, and Fertilizer Application
11. Flood Control Projects
12. Spill Prevention and Response

This Manual addresses components for two of the minimum control measures, Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping, as follows:

Illicit Discharge Detection and Elimination (IDDE) – This Manual describes the procedures that are used to develop the IDDE program for the City of Leeds. This Manual offers the outline of the steps used by Leeds to develop an overall IDDE program that is implemented by each municipality. The basic steps currently underway by Leeds are: 1) Location of priority areas likely to have illicit discharges 2) Mapping of all storm drain systems 3) implementing an illicit discharge detection program through dry screening and outfall monitoring 4) Developing uniform procedure to trace sources of illicit discharging 5) Developing

procedures to remove sources, and 6) Evaluating overall IDDE program effectiveness. This Manual provides information on each of the six steps currently being deployed by Leeds, and how they result in an effective IDDE program that fulfills the intent of the General Permit.

Pollution Prevention/Good Housekeeping for Municipal Operations – This Manual provides the Program Manager and municipal staff with the resources and technical references to aid the City of Leeds in implementing their own Pollution Prevention/Good Housekeeping program. The General Permit requires the following Pollution Prevention/Good Housekeeping components as part of the overall plan:

a) *A program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program will include employee training through the City of Leeds*
b) *Maintenance activities for the following: parks and open spaces (area such as public golf courses and athletic fields); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance and storm sewer maintenance.*
c) *Schedules and records for municipal maintenance activities in paragraph (b) above.*
d) *Inspection procedures and schedules for long term structural controls.*

2.4 MANUAL AUDIENCE AND ORGANIZATION

The Stormwater Phase II Program requires the development of new programs as well as training for municipal employees to implement the overall stormwater program during daily activities. For this reason the Manual addresses two distinct types of audiences (1) City Engineers; City Officials, and (2) municipal employees, such as public works personnel, who implement the programs on a day-to-day basis.

Chapter 1 will provide an introduction and overview of the Manual. Chapter 2, *Illicit Discharge Detection and Elimination,* presents procedures for City Engineers, City Officials to use in identifying high priority areas, tracing illicit discharges, and

eliminating illicit discharges in a timely manner. Chapter 3, *Pollution Prevention and Good Housekeeping*, provides the general details on the many ways that municipal activities such as vehicle and facilities maintenance may adversely affect stormwater, and presents ways to modify municipal operations to better prevent and reduce stormwater pollution.
Chapter 3 also gives some details on how to develop procedures related to good housekeeping and pollution prevention.

The Appendices are intended for use by "in-the-field" municipal employees. Appendix A contains some guidelines and standard operating procedures (SOPs) employed by the City of Leeds for use in the detection and elimination of illicit discharges. Appen dix B contains guidelines, SOPs, and forms to use in applying pollution pr evention and good housekeeping techniques during regular work duties.

The guidelines will be divided into three categories to make them easier for all users. These categories are: Always, whenever possible, and Never. Facility Managers are encouraged to keep up with any changes that occur in specific regulatory compliances with any SOPs in this Manual and should contact Development Services accordingly. Specific training on the guidelines and SOPs will help to reinforce their importance and encourage implementation.

2.5 COMMON STORMWATER POLLUTANTS, SOURCES, AND IMPACTS

Stormwater runoff contains pollutants that can harm human health, degrade water quality and aquatic habitat, impair water recreational activities, and impair ecosystem functions. On its way into our local streams, rivers, and other receiving waterbodies, stormwater runoff accumulates pollutants such as oil, gas, and other hydrocarbons, heavy metals, deicers, pesticides, fine sediment, fertilizers and bacteria(pathogens), all of which cause impairment to water quality. Runoff from fertilized lawns, golf courses, right-of-ways, and city parks can contribute excess nutrients to waterbodies, which can lead to algal blooms and in extreme cases, fish kills events due to low dissolved oxygen levels. Elevated fecal coli form from sewage or other sources can impair water quality and can lead to restrictions on use and enjoyment of natural resources such as fishing and swimming areas. Other stormwater pollutants of concern are toxic contaminants, such as heavy metals, mercury, pesticides, which can come from vehicles, businesses, or from homeowner activities.

All of these pollutants can be dissolved in water and can wash into receiving bodies during storm events. Understanding the sources of these pollutants and the impacts each pollutant has can help identify the priority goals and objectives of Leeds. Table 1-1 summarizes common stormwater pollutants, their sources and potential impacts.

TABLE 1-1:
COMMON STORMWATER POLLUTANTS, SOURCES AND IMPACTS

Pollutant	Sources	Impact
Sediment	Construction sites; eroding stream banks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites.	Destruction of plant and fish habitat; transportation of attached oils, nutrients and other pollutants; increased maintenance costs, flooding.
Nutrients (phosphorus, nitrogen)	Fertilizers; malfunctioning septic systems; livestock, bird & pet waste; vehicle/boat washing; grey water; decaying grass and leaves; sewer overflows; leaking trash containers, leaking sewer lines.	Increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms).
Hydrocarbons (petroleum compounds)	Vehicle and equipment leaks; vehicle and equipment emissions; pesticides; fuel spills; equipment cleaning; improper fuel storage & disposal.	Toxic to humans and aquatic life at low levels.
Heavy Metals	Vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; batteries; fuels; pesticides; cleaners.	Toxic at low levels; drinking water contamination.
Pathogens (Bacteria)	Livestock, bird and pet wastes; malfunctioning septic systems; sewer overflows; damaged sanitary lines.	Risk to human health leading to closure of shellfish areas and swimming areas; drinking water contamination.

USEPA defines an illicit discharge as any discharge to an MS4 that is not composed entirely of stormwater or the allowable non-stormwater discharges such as water from fire fighting activities, infiltrating groundwater, etc.. (See list below).

Allowable Non-Stormwater Discharges

1. Water line flushing
2. Landscape irrigation
3. Diverted stream flows
4. Rising ground waters
5. Uncontaminated ground water infiltration (as defined in 40 CFR 35.2005 (20))
6. Uncontaminated pumped ground water
7. Discharge from potable water source
8. Foundation drains
9. Air conditioning condensation
10. Irrigation water, springs
11. Water from crawl space pumps
12. Footing drains
13. Lawn watering
14. Individual resident car washing
15. Flows from riparian habitats and wetlands
16. Dechlorinated swimming pool discharges
17. Street wash water
18. Residential building wash waters, without detergents

Chapter 2

II. ILLICIT DISCHARGE DETECTION AND ELIMINATION

In our communities, the municipal separate storm drain systems discharge to receiving waterbodies without treatment. Therefore, it is particularly important that only stormwater is discharged and to ensure that illicit discharges are eliminated from the system. The General Permit requires that an effective IDDE program be developed by the regulated municipalities. The use of SOPs by the City of Leeds will allow for a unified approach to formulating an effective IDDE program. The Center for Watershed Protection's (CWP) *Illicit Discharge Detection and Elimination- A Guidance Manual for Program Development and Technical Assessments* (2004) , the New England Interstate Water Pollution Control Commission's (NEIWPCC*) Illicit Discharge Detection and Elimination Manual- A Handbook for Municipalities* (2003) , and *Guidelines and Standard Operating Procedures- Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping* were used to develop this chapter.

This chapter provides some procedures that are being employed or deemed necessary to create an effective IDDE program in accordance with the USEPA General Permit. City officials should have a good understanding of the types of illicit discharges that may be encountered and the proper procedures and roles that are deployed by city officials to address the problems.
Section 2.1 describes various types of illicit discharges that may be encountered in the City. The next sections address additional steps that can be taken or are currently underway to create an effective IDDE program. The subsequent sections will then address additional steps that are being taken by the City to create an effective IDDE program such as: locating priority area s within City (Section 2.2), storm-drain mapping (Section 2.3), detecting illicit discharges (Section 2.4), tracing illicit discharges back to its source (Section 2.5), removing illicit discharges (Section 2.6), and tracking illicit discharges (Section 2.7). Lastly, Section 2.8

provides an approach to evaluating the overall IDDE program.

2.1 TYPES AND SOURCES OF ILLICIT DISCHARGES

The USEPA defines an illicit discharge as "*any discharge to a regulated small MS4 or to the waters of the State of Alabama that does not consist entirely of stormwater or allowable non-stormwater discharges".* Illicit discharges are often categorized according to frequency, which provides information about the source and helps determine which tracing procedures may be useful in locating the discharge. The following three categories provide a good basis for defining illicit discharges:

1. Transitory illicit discharges are typically single occurrence events resulting from spills, breaks, dumping or accidents. Transitory illicit discharges are often reported to an authority through the City Hot line 205-699-2094 and website leedsalabama.org or cityemployee observation while performing regular duties.
2. Because they are not recurring, they are the most difficult to identify, trace, and remove. The best methods to reduce transitory discharges is through the use of education to the general public, municipal response personnel, tracking of discharge locations, and enforcement of an illicit discharge ordinance.
3. Intermittent illicit discharges occur occasionally over a period of time (several hours per day, or a few days per year). Intermittent discharges can result from legal connections to the storm drain system, such as a legal sump pump connection that is illegally discharging anything other than groundwater. Intermittent discharges can also result from activities such as a drum washing in exterior areas. These types of discharges are more likely to be discovered, and are less difficult to trace and remove, but can still present significant challenges. These discharges can have large or small impacts on waterbodies depending on pollutant content, duration, and the size of the receiving water body.
3. Continuous illicit discharges are typically the result of direct connection from a sanitary sewer, overflow from a malfunctioning septic system, inflow from a connection from a commercial or industrial facility. Continuous illicit discharges are usually easiest to trace and can have substantial pollutant loads. (CWP 2004).

Land use should be a major contributing factor when looking for illicit discharges. Table 2-1 provides a list of conditions and activities that may

produce transitory and intermittent discharge, along with associated sources and land use. Table 2-2 lists possible sources of continuous discharges and their associated land use.

TABLE 2-1:
LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE TRANSITORY OR INTERMITTENT ILLICIT

Land Use	Likely Source Locations	Condition or Activity that Produces Discharge
Residential	Apartments Multi-family Single family detached	Driveway cleaning Dumping/spills (e.g., leaf litter and RV/boat holding tank effluent) Equipment/vehicle wash-downs Septic system maintenance Swimming pool discharges
Commercial	Campgrounds/RV parks Car dealers/rental car companies Car washes Commercial laundry/dry cleaning Gas stations/auto repair shops Marinas Nurseries and garden centers	Building maintenance (power washing) Dumping/spills Landscaping/grounds care Outdoor fluid storage Parking lot maintenance (power washing) Vehicle fueling Vehicle maintenance/repair Vehicle washing Wash-down of greasy equipment and grease traps

Industrial	Auto recyclers Beverages and brewing Construction vehicle washouts Distribution centers Food processing Garbage truck washouts Marinas, boat building and repair Metal plating operations Paper and wood products Petroleum storage and refining Printing	Industrial process water or rinse water Loading and un-loading area wash-downs Outdoor material storage
Municipal	Airports Landfills Maintenance depots Municipal fleet storage areas Ports Public works yards Streets and highways Golf courses Schools	Building maintenance (power washing) Dumping/spills Landscaping/grounds care Outdoor fluid storage Parking lot maintenance (power washing) Road maintenance Emergency response Vehicle fueling Vehicle maintenance/repair Vehicle washing Aircraft deicing

TABLE 2-2:
LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE *CONTINUOUS* ILLICIT DISCHARGES

Land Use	Condition or Activity that Produces Discharge
Residential	• Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain • Failed septic systems discharging to storm drain system
Commercial/Industrial	• Failed sanitary sewer infiltrating into storm drain • Process water connections into storm drain • Sanitary sewer connection into storm drain
Municipal	• Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain

SOURCE (Tables 2-1 and 2-1): Modified from Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, 2004. p.12, Table 2.

The illicit discharge detection system provided by the City uses these criteria to provide an effective detection and elimination program to address all types of illicit discharges.

2.2 LOCATING PRIORITY AREAS

Section 2.2 provides the methodology for locating priority areas that have a high potential for illicit discharges. The City of Leeds is continually evaluating/improving this process as changes arise and illicit discharges are removed (described in Section 2.6) This allows for a continuous modeling approach on where illicit discharge detection assets should be placed.

To locate priority areas within our city is:

1. Continually monitoring watersheds for any substantial changes such as local water quality classifications (303 d and various others) by using current water quality monitoring for trending data. This helps divide the watershed into discrete areas that can obtain different priority levels.
2. Gathering and evaluating available information that provide clues as to where in the community illicit discharges might be found (e.g. older neighborhoods, industrial parks, and gentrified neighborhoods). This is done by taking data from ADEM issued

Natural Resource Conservatiion Service (NCRS)

Level	Name	HUC Number
1	Region	2 digit
2	Sub-Region	4 digit
3	Basin	6 digit
4	Sub-basin	8 digit
5	Watershed	10 digit
6	Subwatershed	12 digit
7	Drainage	14 digit
8	Site	16 digit

NPDES permitted sites, Sanitary Sewer Overflows, Land usage, and outfall quantity and type and plotting them using Geographical Information System (GIS) mapping technology. The maps are then examined for areas where concentrations of all these components tend to occur.

3. Using existing information to assess where illicit discharges may be found and what waterbodies are particularly sensitive (e.g. drinking water sources, areas containing unique biodiversity, and swimming areas).

The following subsections present further discussion on each of these areas. The mapping and watershed prioritization conducted the City will help to manage each of these areas.

2.2.1 Indentify Watersheds and Waterbodies

In order to identify priority areas where illicit discharges may occur, a decision must be made as to how to define an "area". The Center for Watershed Protection recommends defining watersheds for individual waterbodies. The National Hydrograph Dataset has a Hydrologic Unit Code (HUC 10) that is used throughout Jefferson County. These 10 digit HUC codes provide an overall framework for delineating the 11 watershed areas within Jefferson County.

Figure 2-1: Jefferson County HUC 10 Watersheds

This approach is particularly useful when reviewing the 303(d) list of impaired waters. Although wetlands are not taken into the HUC coding program they are taken into account in any water resource planning.

2.2.2 Review Available Information

Priority areas for our overall IDDE program will vary from one municipality to another depending on water quality conditions, land use, etc. The following is a list of resources that is compiled on a continual basis as well as a brief description of the factors used in the prioritization process:

Some Common Impairments in Jefferson County

- GIS land use maps - industrial areas with high density development may have a high potential to contain an illicit discharge.
- Locations of previous illicit discharges- areas with historical illicit discharge reports or previous citizen complaints are considered high priority.
- Approximate density of known outfalls per stream mile - areas with a high density of outfalls are considered high priorities.
- Age of infrastructure/development – older areas of the community with known high septic tank failure rates or improper stormwater infrastructure is considered a priority.
- Location of public sanitary sewer/age of sewer/date of separation – Older areas that were put on sewer long ago or have or have areas that are susceptible to pipe erosion are considered a priority.
- Water Quality Information

- Nutrients
- Siltation
- Pathogens
- Pesticides (Dieldrin)
- Turbidity
- Temperature
- pH
- Oil and grease

<u>Water Quality Classification for the State of Alabama applicable to Jefferson County is as follows:</u>

Outstanding Alabama Water (OAW)
Public Water Supply (PWS)
Swimming and Other Whole Body Water-Contact Sports (S)
Fish and Wildlife (F&W)
Limited Warmwater Fishery (LWF)
Agricultural and Industrial Water Supply (A&I)

For specific information on the classification of specific rivers go to:

http://www.epa.gov/waterscience/standards/wqslibrary/al/al_4_11wqs.pdf

ADEM 303(d) list – ADEM and EPA evaluate water quality of Alabama surface waterbodies and generate the 303(d) list of impaired water bodies. The list includes a description of the use that is impaired, the cause of the impairment, and the source. In some cases ADEM has identified illicit discharges or wet weather discharges as the cause. If one of the municipalities has a waterbody that is impaired due to wet weather or illicit discharges it becomes a priority to Storm Water and JCDH Impaired waters on the 303(d) list will be subjected to Total Maximum Daily Load (TMDL) standard for the pollutant of concern. This TMDL (when available) is factored into the overall IDDE program. This list is provided to the public at http://adem.alabama.gov/programs/water/wquality/2010AL303dList.pdf

- Areas that drain to public beaches or drinking water sources – These areas are designated as high priority areas for public health and economic reasons.

It should be noted that the above list is not exhaustive. There may be additional data pertinent to locating priority areas that are constantly evolving. The use of any of these will be based on the personal knowledge and experience of city officials.

2.2.3 Evaluate Illicit Discharge Potential

The understanding of the unique waterbodies spread throughout the municipalities of Jefferson County allows the officials of the CityStorm to establish a priority ranking. This will assign values of High Priority, Medium Priority, or Low Priority to each watershed. Table 2-4 provides an example of one of the components employed where criterion is evaluated for each waterbody and assigned an illicit discharge potential (IDP) of 1 for low potential, 2 for medium potential, and 3 for high potential. The scores for each waterbody are then averaged to produce a resultant overall score for the waterbody that will range from 1 (low priority) to 3 (high priority). Figure 2-2 shows a GIS mapping detection system that is the major component along with scoring that allows for priority areas to be assigned to each watershed.

The IDDE prioritization process allows the city to focus their efforts on:

- Areas that need further mapping
- Community-specific detection techniques
- Prioritization of storm drain system maintenance work

TABLE 2-4:
EXAMPLE PRIORITIZATION TABLE USING AVAILABLE INFORMATION

	Land Use	NHDES Category on 303(d) List	Stormwater Outfall Density (# of Outfalls per Stream Mile)	Average Age of Development (years)	Raw IDP Score	Normalized IDP Score**
Area A	Commercial (2)*	Impaired – Other Source (2)*	14 (2)*	40 (2)*	8	2
Area B	Residential (1)	Not Impaired (1)	10 (2)	10 (1)	5	1.25
Area C	Industrial (3)	Impaired – Illicit Discharge or Stormwater (3)	16 (2)	75 (3)	11	2.75
Area D	Residential (1)	Not Impaired (1)	9 (1)	15 (1)	4	1
Area E	Residential (1)	No data available	21 (3)	20 (1)	5	1.67

Notes:

The number in parentheses is the Illicit Discharge Potential (IDP) "score" (with 3 defined as a high IDP) earned for that area for the category Identified. Basis for assigning scores (based on benchmarks) to assess IDP is defined as follows:

Category Definitions	Land Use	JCDH Category	Stormwater Outfall Density	Average Age of Development
High (3)	Industrial	Impaired-illicit discharge or stormwater	>20	>50
Medium (2)	Commercial	Impaired- other source	10-20	25-50
Low (1)	Residential	Not impaired	<10	<25

Normalizing the raw IDP scores (by dividing the raw score by the number of screening factors assessed) will produce scores that fall into the Standard scale of 1 to 3 for low to high IDP, respectively.

SOURCE: Modified from Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, 2004, p.53, Table 15.

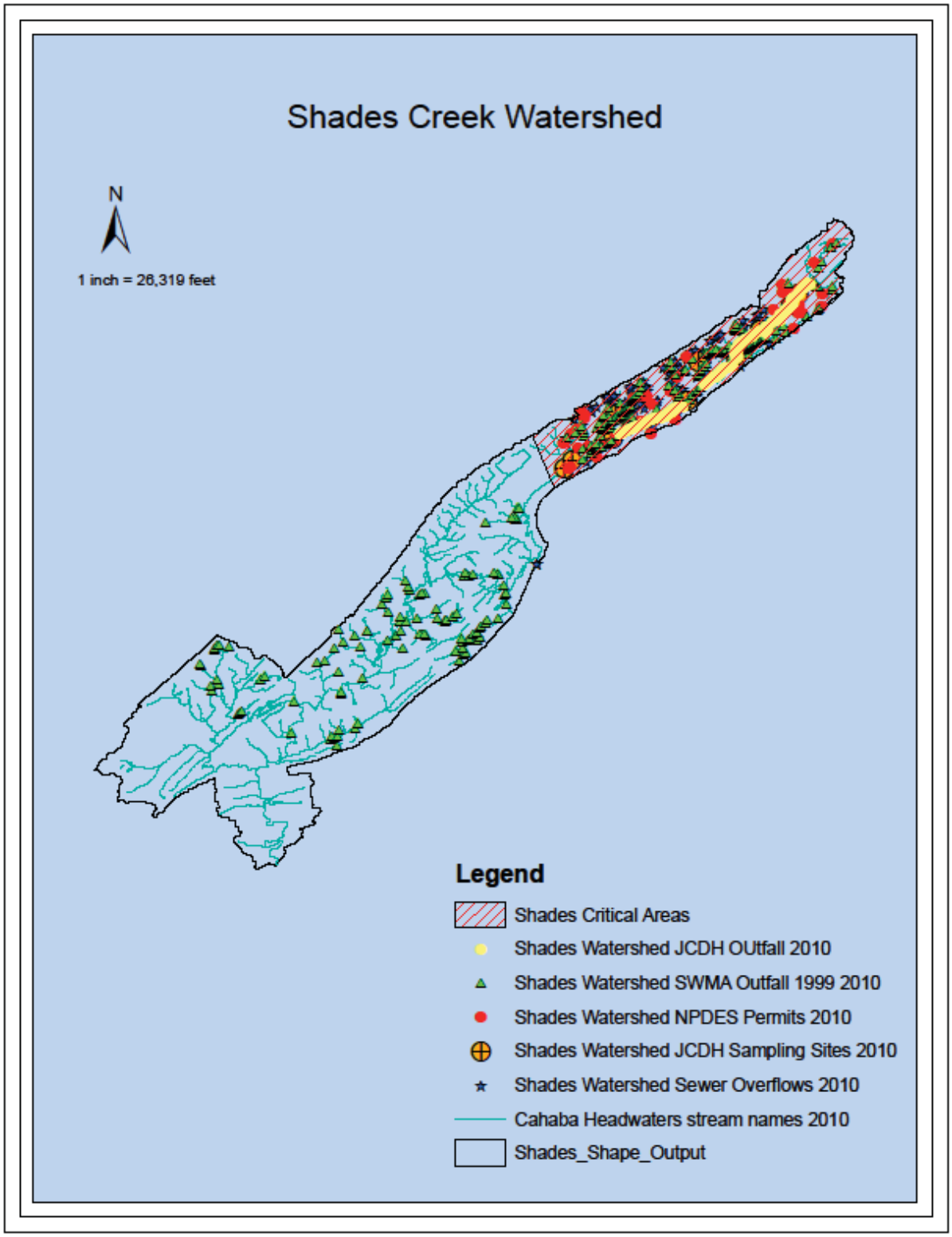


Figure 2-2 Shades Creek Watershed

2.3 MAPPING THE SYSTEM

This section will focus on the development of a comprehensive storm drain map using GIS technology. The strategy used to build the storm drain map by the city is as follows:

1. Review/ Office Preparation:
    a) Existing GIS maps were checked for data in high priority areas first, then medium priority areas, then low priority areas. The maps used came from various sources including Jefferson County, the city and various state and local agencies. The maps obtained showed land usage, development area patterns, tax maps, as well as Storm Water priority areas.
    b) A naming and numbering system was developed for outfalls as well as GIS coordinates and pictures of all outfalls were stored in a data dictionary. This will facilitate future inspections and aid in documentation of maintenance.
    c) A system of marking outfalls is being employed to help mark outfalls in the field. Spray paint is being examined but a more permanent system would be ideal.
    d) Equipment was obtained for mapping including all on the list and a few items that are excluded.
    e) A preliminary schedule was developed to show the various steps need to reach completion. This schedule is subject to change based on factors such as weather, creek level, or other factors.
    f) Canoes were put into service for areas that could not be walked. Areas that have thick undergrowth were identified as areas to be walked during the fall or winter months.
    g) Sampling sites and results were taken into account in what areas needed to be first priority.

2. Field verification:
    a) All major waterbodies within a given area of a municipality are being walked and outfall data collected on a weekly basis. The outfalls are identified using a global positioning system (GPS). ESRIARCMAP is being used to post-process the points to even greater accuracy than the GPS unit alone can provide. The outfalls are also being assigned a number in the GPS data dictionary as well as a picture taken by GPS Units.
    b) Spray paint is used in the field to identify outfalls.
    c) Dry weather sampling is being conducted in regular intervals at sites designated by the city on the major feeder creeks. There are ten (10) of these sites along the feeder creeks in our municipalities. Dry weather screening on outfalls is also conducted on complaints and whenever an opportunity presents itself.
    d) Dry weather screen is also being conducted on each tributary area twice a year to document any pollutant loadings.

3. Develop Initial GIS Maps: The storm drain systems are being mapped as a larger part of the GIS database for the Storm Water members. The new data collected has the option to be displayed with any of the existing data sets.
4. The City has the ability to display aerial photography, street maps, municipal boundaries, and various other layers as backdrops for relevant GIS maps. Aerial photographs are one of the most interesting background files to use to display information; however, their large file size (20 MB and larger) can make them impractical for all applications. An alternate way to display our mapped information consists of downloading either United States Geological Survey (USGS) quadrangles, or a set of roads, political boundaries, waterbodies, and watershed information from various other local and governmental sources.

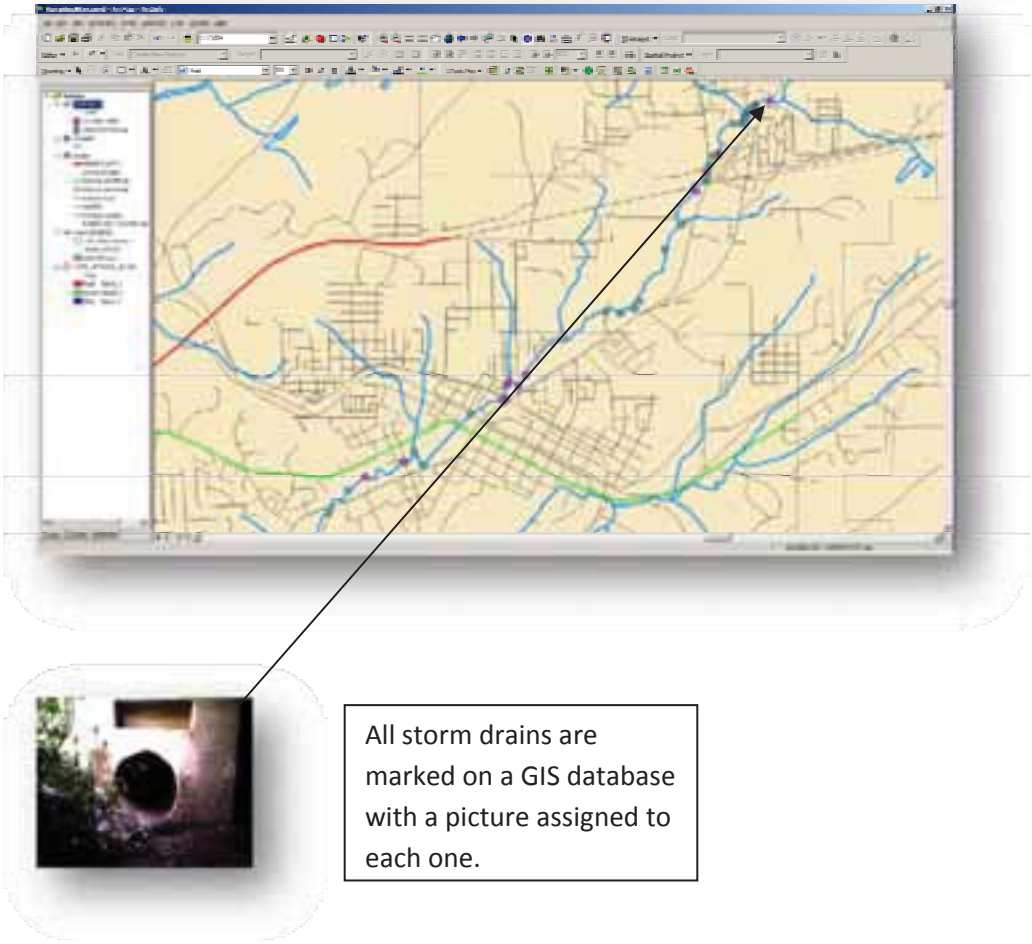
   Triangulated Irregular Network (TIN) maps are used by JCDH to formulate 3-dimensional pictures of watersheds and how data can affect the waterbodies therein. The 3-dimensional maps allow water to be traced from source to areas where it will

likely be terminate into a major feeder creek.

4. Review and field check other structures (catch basins, culverts, pipes, ditches, drain manholes, etc.):
    a. Aerial photography was first used to identify stormwater detention structures. Field Staff along with local firemen are now in the process of locating various catch basins that are undetectable using aerial photography, a n d taking photographs of pipe locations and sizes. The design details will then be used to get a detailed overview of all structures. A GPS unit with a data logger is being used to take photographs and pinpoint locations.
    b. Quality Assurance/ Quality Control are performed in the office on a daily basis on all data recorded.
    c. All data collected has a unique point type and number assigned.
5. Incorporate field data into GIS and revise as necessary: Once the GPS data files have been converted into GIS layers, and revised maps have been produced; these maps are proofed to assess their accuracy and completeness. The JCDH reviewer documents any additional data requirements, and corrects any errors in the information collected. A relational database helps JCDH and local municipalities establish the connections between pipes, outfalls, and other structures.

The mapping database should be completed in a four year period depending on resources and availability starting on August, 1, 2010. Below in Figure 2-3 is a sample GIS map generated by JCDH.

Figure 2-3: Storm and Outfall GIS map



All storm drains are marked on a GIS database with a picture assigned to each one.

2.4 DETECTION

Dry Weather Discharge Definition

The CWP defines **dry weather** as a 48 hour period with no runoff producing rain fall. The City defines dry weather as a 48-72 hour period with less than 1/10-inch rainfall.

Illicit discharges can be detected in many ways. Determining which detection methods are appropriate for a municipality can be a relatively simple process. An example of this selection process is provided in Table 2-6. Sheets such as this as well as the following information are used to generate the areas and the frequency of inspections.

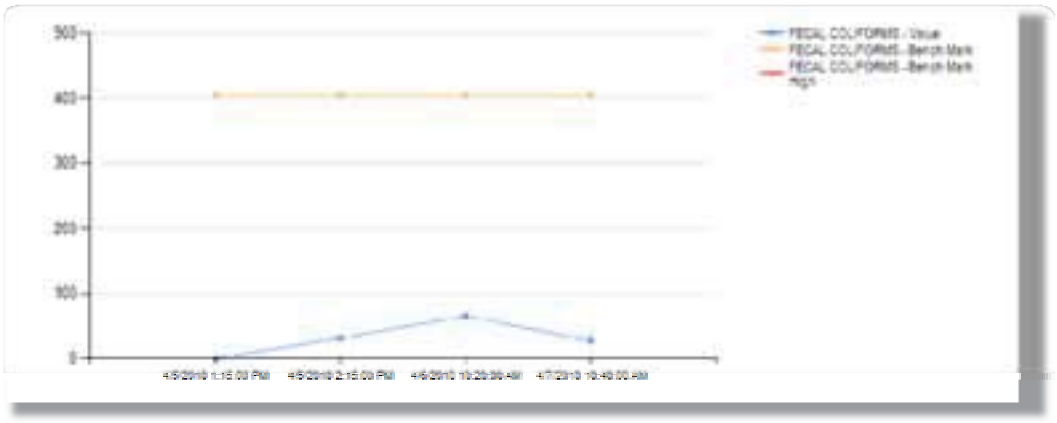
2.4.1 Dry Weather Inspections During Mapping (or initial inspections)

The Dry Weather Inspection Form (see Appendix A) can be used during the mapping to detect the continuous and intermittent discharges. The form is completed whenever evidence of an illicit discharge such as significant flow during dry weather, the presence of raw sewage indicators, staining, or residue, is observed. The discharge is then filed into a complaint form like the one seen below in Figure 2-5.

2.4.2 Long-Term Dry Weather Inspections

Long-term, regular inspections of outfalls are a primary part of City's IDDE program. Regular inspections are not significantly different from inspections conducted during mapping. The major difference is that a crew or inspector will have historical data to work with to make assessments. These inspections are kept in an electronic database that is analyzed for any higher than expected sample values by using the bench marks in the Figure 2-4 below. The database is then used to direct inspectors on follow-up visits to investigate problem samples. The database also can provide a graph that gives a good baseline above which a sample should not reach. These sites are sampled at least four times a year and can be sampled on an as needed basis.

Figure 2-4: Sampling Program



Date Range: 7/6/2009 thru 7/6/2010

Site Name	Sample Date	Test Name	Result Value	Result Text	Unit	Weather	Sample Type	Lab Id	Lab Method
VES-CAR-076T	4/5/2010 1:15:00 PM	FECAL COLIFORMS	1	<1.00	COL/100ML	DRY	GRAB	20100695-01	9222D
VES-CAR-078T	4/5/2010 2:15:00 PM	FECAL COLIFORMS	32	32.0	COL/100ML	DRY	GRAB	20100696-01	9222D
VES-CAR-079T	4/6/2010 10:20:00 AM	FECAL COLIFORMS	66	66	COL/100ML	DRY	COMP	20100704-01	9222D
VES-CAR-077T	4/7/2010 10:40:00 AM	FECAL COLIFORMS	28	28	COL/100ML	DRY	GRAB	20100731-01	9222D

A schedule of long-term inspections for outfalls was then developed. The CWP recommends inspecting all outfalls once, at a minimum, during the first permit cycle. The City is currently inspecting all outfalls and coming up with a grid system to allow for more efficient

management of personnel. Further inspections are conducted to supplement the existing inspections as personnel and funds allow. Long-term inspections are conducted during dry weather to maximize the potential to observe evidence of illicit discharges and form baseline trends. Winter and summer inspections are conducted at 10 sites to help monitor illicit discharges. The use of interns reduces cost, but to ensure quality of service each intern is trained in safety and identification techniques. If any problems are discovered a procedure is in place to allow for examination by more experienced personnel.

2.5.1 Opportunistic Inspections

Most public works crews conduct their regular duties in and around the storm drain system. A Supervisor may elect to have crews conduct outfall inspections on an informal basis while performing other work, or the supervisor may elect to have crews informally "keep a look out" for illicit discharges. If a city employee observes evidence of an illicit discharge during an informal or non-routine inspection, he/she should collect as much information about the potential illicit discharge as possible then contact his/her supervisor which will relay the information to the Developement Department.A complaint form will then be generated by the city containing the information given and will be worked so as to alleviate the problem. A sample complaint form is shown on the next page in Figure 2-4.

Figure 2-4: Sample Complaint Form

Examples of Illicit Discharge Indicators

Color
Floatables
Solids
Turbidity
Oil sheen
Grey mat
Odor

While it may not be possible for all municipal employees to be able to personally call in an illicit discharges, there should be several other ways they can help alleviate this problem such as:

- The person observing the discharge can provide the information verbally to a dispatcher or the supervisor, who can then call in the complaint to the hotline.
- Personnel can log into city's website to report any complaint concerns; however this option may be a bit more time consuming and immediate needs should be called in.
- A "local" stormwater program employee can be called to come investigate the complaint on an as needed basis.

It is important to collect as much information as possible at the time of the initial observation due to the likelihood that a discharge may be transitory or intermittent. Initial identification of the likely or potential sources of the discharge is also very important.

2.5.2 Citizen Call-In Inspections

A citizen call-in program is an effective way to identify illicit discharges.

The City has a stormwater hotline that is accessible and publicized througout the city. To maximize the effectiveness of citizen call-ins, the complaint system is filtered by an initial inspection so that each complaint is addressed and identified as valid. Upon validation the complaint is worked within 7-10 business days. The form is filled out with the citizen‘s information along with all relevant complaint information. There are a few ways through letters and faxes that anonymous complaints can be generated but most complaints must have an original complainant so as to be able to notify someone of the results. These are done by environmental health specialists as well as stormwater employees. The hotline is also accessible through city’s website at WWW.LEEDSALABAMA.ORG.

2.5.3 Septic System Inspections

Septic System inspections are conducted through JCDH’s Community Environmental Protection Division. The older rural and low density areas that are prone to septic tank failures are identified first and any problem is reported internally to that division to handle. Any failure is then handled in a timely manner and the tank is pumped out until the failure is repaired to prevent leaking into the storm sewer system.

2.5 TRACING ILLICIT DISCHARGES

Once an illicit discharge has been reported or detected through an inspection, the next step is to locate the source. Selection of tracing techniques will depend on the type of illicit discharge detected, information collected during the initial discovery period, observation (whether through an inspection by a municipal employe or through a citi zen call-in), and the resources/technology available to the municipality. A single technique may be used or several techniques may be used in combination to identify the source ofthe discharge. Figure 2-5 presents a flow chart for select ing tracing techniques that can be applied to the two categories of pot ential illicit discharges: (1) transitory or intermittent discharges (where upon returning to the site, no flow is present at the location where the illicit discharge was initially reported), and (2) continuous dischar ges (where upon returning to the site a continuous flow is present and th e flow may be more easily traced to its source). Each of these circumstances is described below:

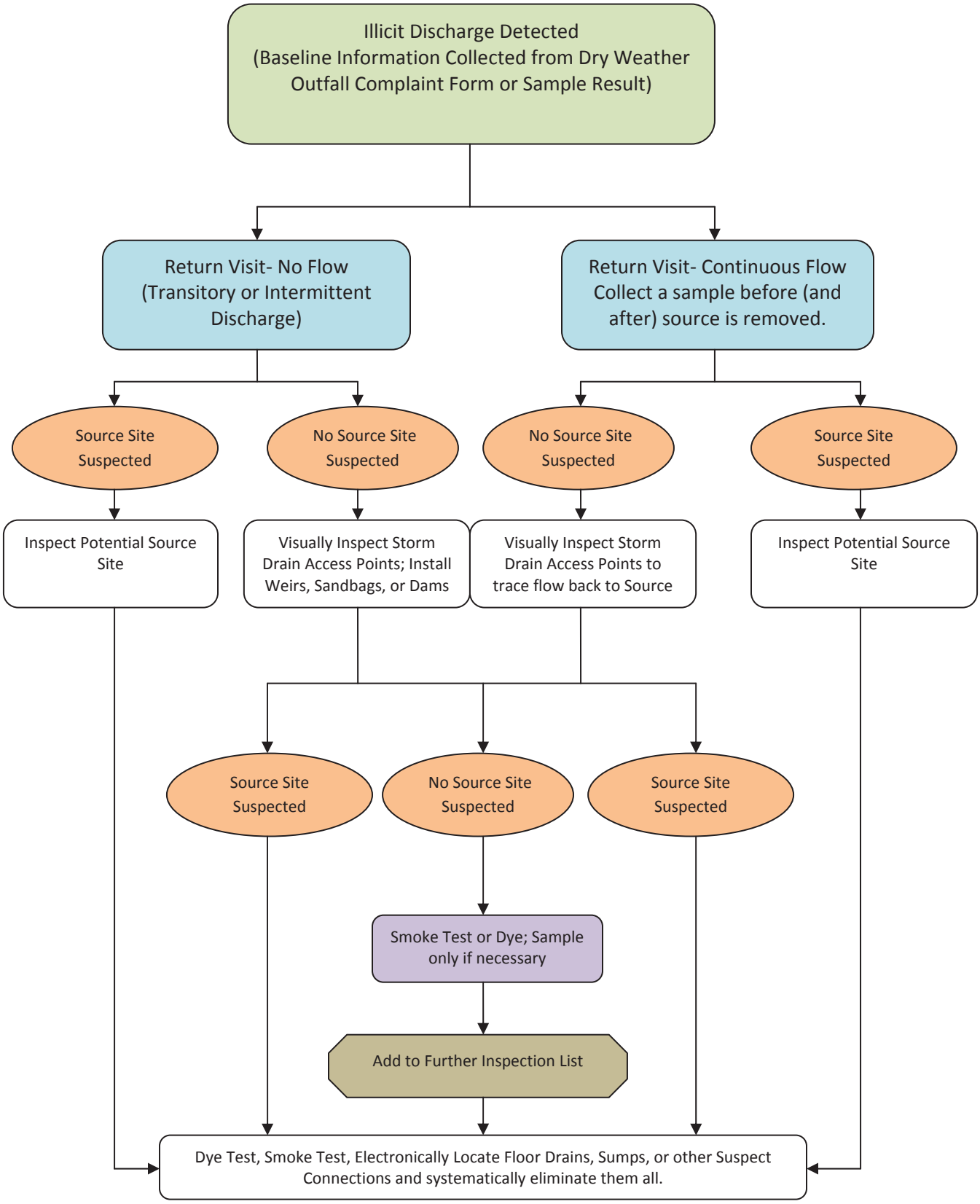
1. Transitory or intermittent discharges: These conditions may occur as a result of an inspection or a citizen complaint. While initial information may have been collected regarding the potential illicit discharge, a return trip may show that the discharge was either

intermittent or transitory (e.g., no flow is present upon return to the site). The investigative techniques used will depend on whether or not a potential source location was identified during the initial observation:

Potential source identified - If a potential source for the illicit discharge was initially identified, steps are taken to investigate the potential source site, such as inspecting the site and storm drain system in the vicinity of the site. If floor drains, sumps, or other suspect discharge locations are observed during this inspection, dye testing, smoke testing, or continuous flow monitoring may be used. These techniques should definitively show whether the suspect site was the source of the illicit discharge.

Potential source not identified - If no source site is suspected, and only the general area of the illicit discharge is known, it may be possible to trace the evidence of the illicit discharge by visual inspection of the storm drain access points. If this catch basin/manhole inspection technique proves to be unsuccessful, some interim steps are taken attempt to capture water from an intermittent discharge. For example, sand bagging, damming or block testing of selected storm drain access points, combined with installation can help reveal the source of the discharge. If these techniques have no positive result (no water pools behind the weir or sand bag), the discharge was likely transitory (one time only), and it may not be possible to determine its origin. In this case, the location of the originally reported illicit discharge is added to the complaint database and tracked for any future incidents. If the original report of the illicit discharge was severe or gross pollution, then smoke testing or televising of the storm drain system may be warranted.

Figure 2-5
Flow Chart for Selecting Tracing Techniques



2. Continuous discharges: Tracing continuous discharges is typically easier than tracing transitory or intermittent discharges. The primary difference between tracing a transitory or intermittent discharge and tracing a continuous discharge is that sandbagging and weirs are not required for a continuous discharge. Visual observation of the system access points should reveal where the flow is coming from. Just as for tracing a transitory or intermittent discharge, if visual inspections fail in identification of the source and the original report was severe or gross pollution, then televising, smoke testing, or sample collection would be warranted. JCDH randomly collects a grab sample for bacterial analysis from any pipe with a significant flow, even if the discharge appears to be clear.

While these conditions may not cover the full extent of discharges that may be discovered, they should provide general guidance on the selection of tracing techniques. The following subsection describes in more detail each of the techniques that can be applied by JCDH, including their advantages and disadvantages.

2.5.1 Tracing Techniques

To select an effective tracing technique, one must have a good understanding of the technique and its limitations. The following is a brief summary of each of the tracing techniques that may be employed by JCDH to locate the source of an illicit discharge:

1. Visual Inspection at manholes/catch basins: This tracing technique is typically used when there is no suspected source site or in residential neighborhoods. It is the most cost effective and efficient method of tracing. Structures are inspected systematically starting at the initial detection location, gradually working upstream through the system. If the inspector is tracking a continuous discharge, the inspections may be relatively easy, and the flow can be traced back to its source. If the inspector is attempting to track a transitory or intermittent discharge, the inspector will make the following observations depending on the information provided from the initial identification: color and clarity of any discharge, staining or deposits on bottom of structure; oil sheen, scum, or foam on any standing fluids in sump of structure; odors, staining or deposits on inlet pipes

and outlet pipes. Depending on what the inspector is looking for, and what they find, they will progressively inspect additional structures until either a potential source is found, or no further evidence is found. If no further evidence is found the inspector may elect to further assess some of the structures by installing sandbags or other damming devices to determine if the discharge recurs. Inspectors are always equipped with proper safety equipment such as proper cone placement, safety vests in traffic areas, confined space entry techniques (if entry is necessary), steel-toed boots, etc.

2. Sampling flowing discharges: As shown in Figure 2-5, samples are collected only in the event a discharge is flowing through the outfall, unless a pollutant is clearly evident in stagnant pools of water or sump water. Table 2-8 lists the parameters that a sample can be analyzed for and provides a general discussion of how the results may be interpreted. This table was taken from the CWP manual (2004) which provides a more detailed discussion of sampling procedures and analysis of results. Sampling and analysis for many of the compounds should be completed by JCDH or other personnel trained in collection, handling, and preservation techniques to ensure accurate data. JCDH recommends collecting a sample when the discharge is initially found and after any source is removed. The sample collected after removing an illicit discharge can indicate if other illicit discharges are present. JCDH also reserves the right to test for any different chemical or pollutant at the inspector's discretion.

TABLE 2-8:
INDICATOR PARAMETERS USED TO DETECT ILLICIT DISCHARGES

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

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.

◙ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.

○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.

* Data are not available to assess the utility as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

** Fluoride is a poor indicator when used alone, but can distinguish between washwater and sewage when combined with analysis for detergents, ammonia and potassium.

SOURCE: Modified from *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004, p. 122, Table 39

3. Sandbagging or damming: Sandbagging and damming is typically only conducted when the discharge flow has ceased since initial detection. Application of this technique is rarely used, but will show whether the discharge is one time only (no water pools behind the sandbag or dam) or intermittent (water pools behind the sandbag). CWP provides the following explanation:

   > This technique involves placement of sandbags or similar barriers such as caulk dams within strategic manholes in the storm drain network to form a temporary dam that collects any intermittent flows which may occur. Any flow collected behind the sandbag is then assessed using visual observations or by indicator sampling. Sandbags are lowered on a rope through the manhole to form a dam along the bottom of the storm drain, taking care not to fully block the pipe (in case it rains before the sandbag is retrieved). Sandbags are typically installed at junctions in the network to eliminate contributing branches from further consideration. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Sandbags are typically left in place for no more than 48 hours, and should only be installed when dry weather is forecast. Sandbags should not be left in place during a heavy rainstorm. They may cause a blockage in the storm drain, or, they may be washed downstream and lost. The biggest downside to sandbagging and damming is that it requires at least two trips to each manhole (CWP, 2004, p.157).

4. Optical brightener monitoring traps: (JCDH is very conservative in the use of this specific technique because the effectiveness is yet to be determined) Optical brightener monitoring (OBM) traps can be used to trace intermittent or transitory discharges that result from washwater with detergent. Detergents usually contain optical brighteners that can be detected at high concentrations using this method. However, the traps only detect highly concentrated discharges. The detergent concentration required to be detected by the light is approximately the same as pure washwater from a washing machine. Consequently, OBM traps may be best suited as a simple indicator of the presence

or absence of intermittent flow or to detect the most concentrated flows. The traps can be made using easily acquired materials.

The traps contain an absorbent, unbleached cotton pad or fabric swatch contained inside a wire mesh trap or section of small diameter (e.g., 2-inch) PVC pipe. The traps should be anchored to the inside of an outfall at the invert using wire or monofilament that is secured to the pipe itself. Rocks or bricks can be used a temporary weight to hold the trap in place.

City inspectors can retrieve the OBM traps after 24 to 72 hours of dry weather. OBM traps are retrieved before coming into contact with stormwater, which will contaminate the trap or wash it away. When placed under a long wave fluorescent ultraviolet or "black" light, an OBM trap will indicate if it has been exposed to detergents. CWP reports that OBM traps have been used with some success in Massachusetts (Sergeant et al. 1998) and northern Virginia (Waye 2000).

5. Dye testing: (Green Fluorescent used by Leeds) Dye testing is typically conducted when a potential source site has been identified, and the inspector is trying to determine whether the site has floor drains or other locations that connect and discharge to the storm drain system. Permission to access the site must be obtained before dye testing can be conducted. Verbal or written requests by Leeds are both acceptable. The inspector should review available sanitary sewer and storm drain maps before conducting the dye testing. The dye testing procedure consists of two steps: (1) discharging the dye into the suspect location, and (2) opening nearby storm drain and sanitary sewer manhole covers to determine where the dye discharges to. This procedure is fairly effective for confirming direct connections into the storm drain system for short reaches. If a longer pipe network is being evaluated, charcoal packets can be left in selected structures and later collected and analyzed for the presence of the dye. If dye testing porcelain structures, tablets or charcoal should be wrapped in tissue before depositing. When dye testing, the inspector takes into account that each structure (sink, toilet, etc.) should be tested separately. Many times a single utility in a basement may be incorrectly connected to a storm drain line instead of a sanitary line.

6. Televising: (Not in use by Leeds at this time, but Jefferson County Environmental Services employs this technique) Televised video inspections are a useful technique when an illicit connection or infiltration from a nearby sanitary sewer is suspected, but little evidence of the illicit discharge remains behind. Two types of video cameras are available for use: (1) a small camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe. Typically the operator of the camera has access to a keyboard or audio voice-over to record significant findings on the videotape that is produced for future review and evaluation.
7. Smoke testing: Smoke testing is a useful technique for tracing intermittent discharges or continuous discharges that have no apparent source site. Smoke is introduced into the storm drain system, and emerges at locations that are connected to the system. Smoke testing works best for short reaches of pipe, or in situations where pipe diameters are too small for video testing.

   The Center for Watershed Protection provides the following dis cussion on planning and executing smoke testing:
   Leeds must provide notice to the public in the immediate vicinity about the date and purpose of the smoke testing. The smoke used is non-toxic, but can cause respiratory irritation, which can be a problem for some residents. Residents will be notified prior to testing, and should be provided the following information (Hurco Technologies, Inc. 2003):

   - Date testing will occur
   - Reason for smoke testing
   - Precautions they can take to prevent smoke from entering their homes or businesses
   - What they need to do if smoke enters their home or business, and any health concerns associated with the smoke
   - A number residents can call to relay any particular health concerns (e.g., chronic respiratory problems)

   Leeds will also notify local media to get the word out if

extensive smoke testing is planned (e.g., television, newspaper, and radio). On the actual day of testing, local fire departments and 911 call centers will be notified to handle any calls from the public.

The basic equipment needed for smoke testing includes manhole safety equipment, a smoke source, smoke blower, and sewer plugs. Two smoke sources can be used for smoke testing. The first is a smoke "bomb," or "candle" that burns at a controlled rate and releases very white smoke visible at relatively low concentrations. Smoke bombs are suspended beneath a blower in a manhole. Candles are available in 30 second to three minute sizes. Once opened, smoke bombs should be kept in a dry location and should be used within one year.

The second smoke source is liquid smoke, which is a petroleum-based product that is injected into the hot exhaust of a blower where it is heated and vaporized. The length of smoke production can vary depending on the length of the pipe being tested. In general, liquid smoke is not as consistently visible and does not travel as far as smoke from bombs.

Smoke blowers provide a high volume of air that forces smoke through the storm drain pipe. Two types of blowers are commonly used: "squirrel cage" blowers and direct-drive propeller blowers. Squirrel cage blowers are large and may weigh more than 100 pounds, but allow the operator to generate more controlled smoke output. Direct-drive propeller blowers are considerably lighter and more compact, which allows for easier transport and positioning.

Three basic steps are involved in smoke testing. First, the storm drain is sealed off by plugging storm drain inlets. Next, the smoke is released and forced by the blower through the storm drain system. Lastly, the inspector looks for any escape of smoke above-ground to find potential leaks. Septic vents on rooftops are clear indicators of cross connections to the storm drain system.

One of three methods can be used to seal off the storm drain. (1) Sandbags can be lowered into place with a rope from the street surface. (2) Alternatively, beach balls that have a

diameter slightly larger than the drain can be inserted into the pipe. The beach ball is then placed in a mesh bag with a rope attached to it so it can be secured and retrieved. If the beach ball gets stuck in the pipe, it can simply be punctured, deflated and removed. (3) Finally, expandable plugs are available, and may be inserted from the ground surface.

Blowers should be set up next to the open manhole after the smoke is started. Only one manhole is tested at a time. If a smoke candle is used, the inspector simply lights the candle, places it in a bucket, and lowers it into the manhole The inspector then watches to see where smoke escapes from the pipe. The two most common situations that indicate an illicit discharge are when smoke is seen rising from internal plumbing fixtures (typically reported by residents) or from sewer vents. Sewer vents extend upward from the sewer lateral to release gas buildup, and are not supposed to be connected to the storm drain system (CWP, 2004, p. 165-166).

2.6 REMOVING ILLICIT CONNECTIONS AND DISCHARGES

Regulated MS4 communities are required to adopt an ordinance or other regulatory mechanism to prohibit illicit discharges to their storm drain system. Storm Water and Leeds operate under the *Erosion and Sedimentation Control Ordinance* enacted on October 1, 1999. This ordinance allows for enforcement procedures that can be taken in the event of discovery of an illicit discharge. A new ordinance is set to be released within the 2011 calendar year and all illicit discharges should be referred to the most current ordinance. This section describes the procedures that should be taken for illicit discharge removal.

Table 2-9 summarizes the procedures that should be followed to ensure a timely and complete removal depending on the types of illicit discharges that may be discovered, and the various responsible parties. For most cases, the enforcement authority in the Ordinance will coordinate discharge removal.

TABLE 2-9:
NOTIFICATION AND REMOVAL PROCEDURES FOR ILLICIT DISCHARGES INTO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM

Financially Responsible Party	Source Identified	Enforcement Authority	Procedure to Follow
Private Property Owner	One-time illicit discharge (e.g., spill, dumping, etc.)	Ordinance enforcement authority (e.g., City official, Leeds official, or various other agencies)	• Contact Owner • Issue Notice of Violation • Issue fine for larger spills
Private Property Owner	Intermittent or continuous illicit discharge from legal connection	Ordinance enforcement authority (e.g., Code Enforcement Officer)	• Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal
Private Property Owner	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., infiltration or failed septic)	Plumbing Inspector, Leeds Community Environmental Protection Division	• Notify plumbing inspector/ • Notify Leeds by complaint • Enforcement Action taken by Leeds
Municipal	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., failed sewer line)	Ordinance enforcement authority (e.g., City official, Leeds official, or various other agencies)	• Issue work order • Schedule removal • Remove connection • Confirm removal
Exempt 3rd Party (see Section 2.6.4)	Any	USEPA	• Notify exempt third party and USEPA of illicit discharge

The following subsections address the issues of financial responsibility for removal (Section 2.6.1), forms and procedures that can be used in association with issuing a Notice of Violation (NOV) (Section 2.6.2), circumstances in which a municipality can take emergency action by referring directly to Leeds for discharges that are a threat to human health or the environment (Section 2.6.3), and procedures to follow when an illicit discharge from an exempt party is identified (Section 2.6.4).

2.6.1 Financial Responsibility

Once an illicit discharge's source has been identified, the financial responsibility of removing it is determined in the *Erosion and Sedimentation Control Ordinance* adopted by all Storm Water members on October 1, 1999. The following describes three cases that might be encountered:

1) The illicit discharge was a private party dumping into the storm drain system (a transient discharge). In this case, the *Erosion and Sedimentation Control Ordinance Article 7, Section 7.05* would allow for first a Notice of Violation, a Compliance Order, and/ or a Cease and Desist Order to be issued and a fine to be imposed of no less than $100.00 and no more than $500.00 a day or up to 180 days in jail.
2) The illicit discharge originated from a connection to the storm drain system (transient, intermittent, or continuous) that was once allowed. Such as an outdated overflow or anything of the nature. The overflow must be fixed on an as needed basis and appropriate action taken. A Notice of Violation could be issued and a fine could be imposed by Leeds if necessary. All washing machines, septic tanks, gray water generators, etc. are disconnected through the Community Environmental Health Division of Leeds.
3) The illicit discharge resulted from an illegal connection (i.e., a connection that violates state plumbing codes). For intermittent or continuous discharges that are the result of an illegal direct connection into the storm drain system, the cost for disconnection will fall to either the property owner of the illegal connection or the municipality, depending on the circumstances of the connection. For example, if the connection was incorrectly applied during a separation project conducted by the municipality, the cost to correct the connection should be borne by the municipality. If the connection was the result of a private contractor working for the resident, the resident would be financially responsible for correcting the connection. Similarly, if the illicit discharge is the result of a failed sanitary sewer line, the party responsible for the failed sanitary sewer line must pay for the correction.

2.6.2 Notice of Violation (NOV)

For violations of the *Erosion and Sedimentation Control Ordinance*, the

Storm Water members issue a Notice of Violation. A Notice of Violation form will be generated by the municipalities and will look similar to the form shown in Appendix A. It should be noted that the NOV describes a schedule for the removal to be completed, as well as a summary of any agreements between the parties.

2.6.3 Emergency Disconnections

The *Erosion and Sedimentation Control Ordinance* allows for a disconnection to the storm drain system for discharges that present "a threat to the environment or to the health or welfare of persons, or to the storm drain system". Disconnections may include blocking pipes, constructing dams, or taking other measures on public ways or public property to physically block the discharge. The municipal enforcement authority for the ordinance may want to call the Jefferson County Department of Health at (205) 930-1230 or the Jefferson County Emergency Management Authority at (205) 254-2039 when making this determination for disconnection.

2.6.4 Discharges from Exempt Parties

Several categories of facilities are regulated by the USEPA for stormwater discharges under other permits. Because these facilities are already responsible to USEPA authority for stormwater discharges, the municipality can exempt them from the *Erosion and Sedimentation Control Ordinance*. If a municipality encounters an illicit discharge that is suspected or determined to be coming from an exempt party that is regulated under USEPA stormwater regulation, the municipality should notify both the suspected discharger and the enforcement authority for that discharger. The notification can be verbal or in writing. Most municipalities have prior experience working with other enforcement authorities for suspected violations of either state or federal law.

The following is a brief list of parties that are regulated under an alternate stormwater program and are present in the *Erosion and Sedimentation Control Ordinance, Article 4 Exclusions:*

TABLE 2-10: EXAMPLE EXEMPT FACILITIES

Exempt Facility	Alternate Regulation They Are Subject To	Enforcement Authority
Alabama Department of Transportation (ALDOT) (in selected urbanized areas)	NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Part V	USEPA
Railroad facilities	NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s	USEPA
Industrial Facilities with selected SIC codes (See Table 2-11 for a complete list)	Multi Sector General Permit for Industrial Activities	USEPA

As shown in Table 2-9, if a municipality identifies that an illicit discharge has come from one of these facilities, they should notify both the discharger and the enforcement authority verbally or in writing of the activity. Standard Industrial Classification (SIC) codes for NPDES Stormwater Multi-Sector General Permit (MSGP) Industrial Facilities are listed in Table 2-11.

TABLE 2-11:
SIC CODES FOR MSGP INDUSTRIAL ACTIVITIES

Sector Name		SIC Code Listing
Sector A:	**Timber Products**	2411, 2421, 2426, 2429, 2431–2439 (except 2434), 2448, 2449, 2451, 2452, 2491, 2493, 2499
Sector B:	**Paper and Allied Products**	2611, 2621, 2631, 2652–2657, 2671–2679
Sector C:	**Chemical and Allied Products**	2812–2819, 2821–2824, 2833–2836, 2841–2844, 2851, 2861–2869, 2873–2879, 2891–2899, 3952 (limited to list)
Sector D:	**Asphalt Paving and Roofing Materials and Lubricants**	2951, 2952, 2992, 2999
Sector E:	**Glass Clay, Cement, Concrete, and Gypsum Products**	3211, 3221, 3229, 3231, 3241, 3251–3259, 3261–3269, 3271–3275, 3281, 3291, 3292, 3296, 3297, 3299
Sector F:	**Primary Metals**	3312–3317, 3321–3325, 3331–3339, 3341, 3351–3357, 3363–3369, 3398, 3399
Sector G:	**Metal Mining (Ore Mining and Dressing)**	1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099
Sector H:	**Coal Mines and Coal Mining Related Facilities**	1221–1241
Sector I:	**Oil and Gas Extraction and Refining**	1311, 1321, 1381–1389, 2911
Sector J:	**Mineral Mining and Dressing**	1411, 1422–1429, 1442, 1446, 1455, 1459, 1474–1479, 1481, 1499
Sector K:	**Hazardous Waste Treatment, Storage, or Disposal Facilities**	HZ
Sector L:	**Landfills and Land Application Sites**	LF
Sector M:	**Automobile Salvage Yards**	5015
Sector N:	**Scrap Recycling Facilities**	5093
Sector O:	**Steam Electric Generating Facilities**	SE
Sector P:	**Land Transportation and Warehousing**	4011, 4013, 4111–4173, 4212–4231, 4311, 5171
Sector Q:	**Water Transportation**	4412–4499
Sector R:	**Ship and Boat Building or Repairing Yards**	3731,3732
Sector S:	**Air Transportation**	4512–4581
Sector T:	**Treatment Works**	TW
Sector U:	**Food and Kindred Products**	2011–2015, 2021–2026, 2032, 2041–2048, 2051–2053, 2061–2068, 2074–2079, 2082–2087, 2091–2099, 2111–2141
Sector V:	**Textile Mills, Apparel, and Other Fabric Product Manufacturing, Leather and Leather Products**	2211–2299, 2311–2399, 3131–3199 (except 3111)
Sector W:	**Furniture and Fixtures**	2434, 2511–2599
Sector X:	**Printing and Publishing**	2711–2796
Sector Y:	**Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries.**	3011, 3021, 3052, 3053, 3061, 3069, 3081–3089, 3931, 3942–3949, 3951–3955 (except 3952 facilities as specified in Sector C), 3961, 3965, 3991–3999
Sector Z:	**Leather Tanning and Finishing**	3111
Sector AA:	**Fabricated Metal Products**	3479, 3411–3499 , 3911–3915
Sector AB:	**Transportation Equipment, Industrial or Commercial Machinery**	3511–3599 (except 3571–3579), 3711–3799 (except 3731, 3732)
Sector AC:	**Electronic, Electrical, Photographic, and Optical Goods**	3571–3579, 3612–3699, 3812-3873
Sector AD:	**Non-Classified Facilities**	N/A

2.7 TRACKING ILLICIT DISCHARGES

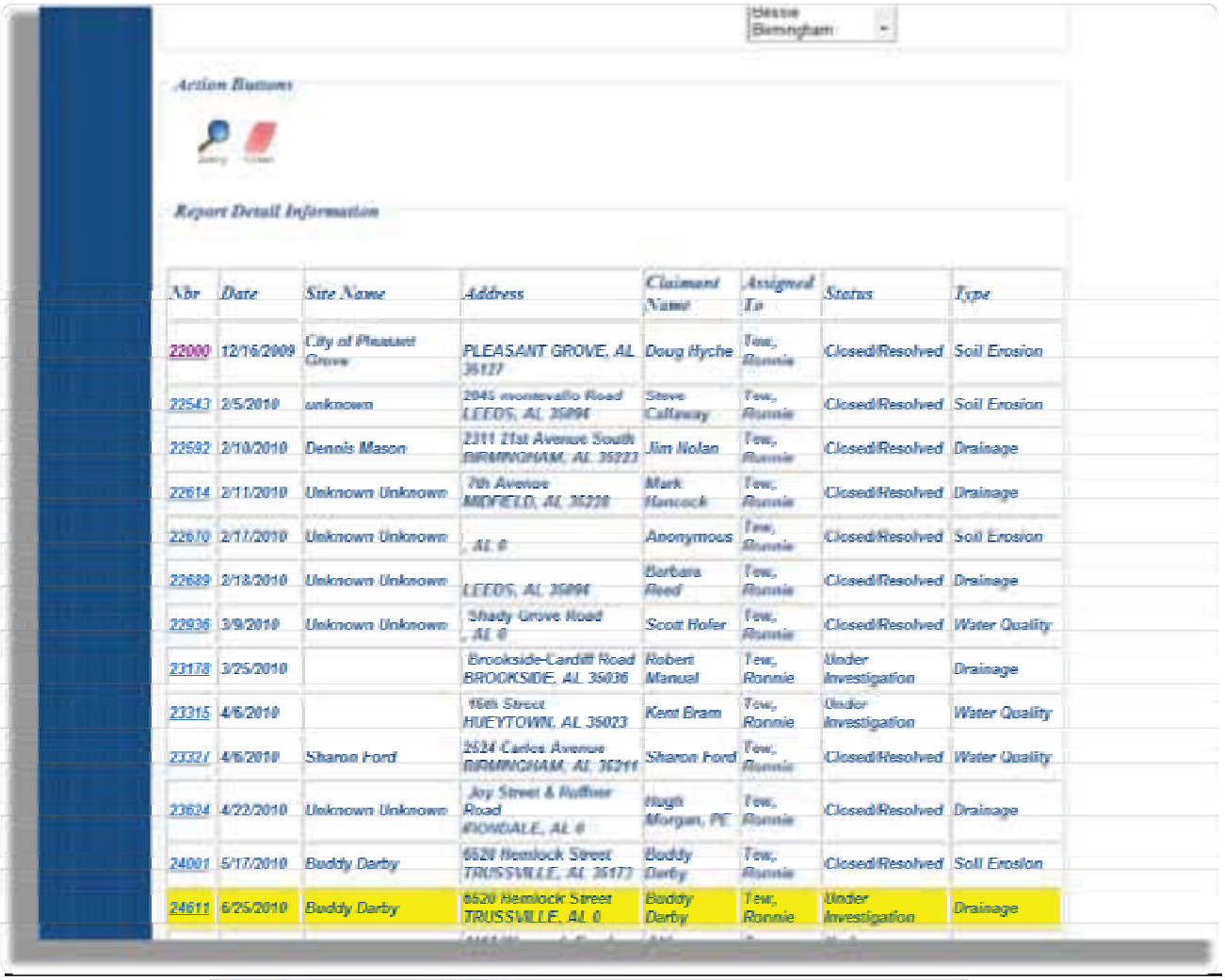
Leeds has developed a long-term stormwater complaint tracking program that can help municipalities better understand the origins of illicit discharges and identify maintenance issues for the storm drain system structures. The complaint tracking program will also facilitate evaluation of the overall IDDE program and will expedite annual reporting. The tracking program is based to address illicit discharge and maintenance issues resulting from the following:

- Citizen's Complaints
- Opportunistic Inspections (such as if an illicit discharge is found while doing outfall monitoring in which Leeds has a self complaint system in place)
- Regular Long Term Inspections (if a sample comes back with high readings any follow-up tests are logged in the complaint system)
- Removal Actions Taken

2.7.1 Electronic Database

A GPS data dictionary has been created that includes all the fields on the Dry Weather Outfall Inspection Form The advantage to this type of tracking program is that the database can be easily linked into GIS. Linking to GIS has allowed mapping of illicit discharge locations, citizen complaint locations, and many other IDDE issues which have assisted greatly in the overall program. Figure 2-12 contains some of the simple attributes that are used in the database. Leeds uses a SQL server database as well for sample technique, results inventory, and an excel spreadsheet for location data.

FIGURE 2-12: STORMWATER PHASE II TRACKING COMPLAINT FORM



Action Buttons

Report Detail Information

Nbr	Date	Site Name	Address	Claimant Name	Assigned To	Status	Type
22000	12/16/2009	City of Pleasant Grove	PLEASANT GROVE, AL 35127	Doug Hyche	Tew, Ronnie	Closed/Resolved	Soil Erosion
22543	2/5/2010	unknown	2045 montevallo Road LEEDS, AL 35094	Steve Calloway	Tew, Ronnie	Closed/Resolved	Soil Erosion
22592	2/10/2010	Dennis Mason	2311 21st Avenue South BIRMINGHAM, AL 35223	Jim Nolan	Tew, Ronnie	Closed/Resolved	Drainage
22614	2/11/2010	Unknown Unknown	7th Avenue MIDFIELD, AL 35228	Mark Hancock	Tew, Ronnie	Closed/Resolved	Drainage
22670	2/11/2010	Unknown Unknown	, AL 0	Anonymous	Tew, Ronnie	Closed/Resolved	Soil Erosion
22689	2/18/2010	Unknown Unknown	LEEDS, AL 35094	Barbara Reed	Tew, Ronnie	Closed/Resolved	Drainage
22936	3/9/2010	Unknown Unknown	Shady Grove Road , AL 0	Scott Hofer	Tew, Ronnie	Closed/Resolved	Water Quality
23178	3/25/2010		Brookside-Cardiff Road BROOKSIDE, AL 35036	Robert Manuel	Tew, Ronnie	Under Investigation	Drainage
23315	4/6/2010		16th Street HUEYTOWN, AL 35023	Kent Bram	Tew, Ronnie	Under Investigation	Water Quality
23321	4/6/2010	Sharon Ford	2524 Carlos Avenue BIRMINGHAM, AL 35211	Sharon Ford	Tew, Ronnie	Closed/Resolved	Water Quality
23624	4/22/2010	Unknown Unknown	Joy Street & Ruffner Road RIVERDALE, AL 0	Hugh Morgan, PE	Tew, Ronnie	Closed/Resolved	Drainage
24001	5/17/2010	Buddy Darby	6520 Hemlock Street TRUSSVILLE, AL 35173	Buddy Darby	Tew, Ronnie	Closed/Resolved	Soil Erosion
24611	6/25/2010	Buddy Darby	6520 Hemlock Street TRUSSVILLE, AL 0	Buddy Darby	Tew, Ronnie	Under Investigation	Drainage

Road construction at 4th Street Pleasant Grove. Road is being put into new Pleasant Grove school off of 4th Street. No DMP. Complaint submitted by Ronnie Tew.

Check Spelling

Other Information

2.8 EVALUATING THE PROGRAM

Leeds evaluates their IDDE program at the end of each year to assess its' effectiveness, efficiency, and to identify where improvements are needed. Table 2-13 is a worksheet that is used at the end of the fiscal cycle to evaluate the following components:

1) Priority Areas: Are the priority areas initially identified still appropriate? Considerations include reviewing the priority worksheet to assess if any changes have occurred since the initial evaluation was completed (such as: Have additional illicit discharges been discovered in any of the areas or is there significant development? Has a new 303(d) list come out naming new waterbodies as impaired?). Leeds also takes into account any negative sample trends in if priority area scopes need to be limited or expanded.
2) Detection Program: Is the detection program effective? Documenting the number of illicit discharges detected by the various detection mechanisms (inspections, citizen call-ins, opportunistic inspections) helps to decide where to allocate resources. This is becoming more extensive as the database at Leeds grows.
3) Tracing Techniques: What tracing techniques were generally used (site inspections, damming, etc)? What tracing techniques were generally effective? In how many instances were visual inspections of the area sufficient to identify the source of the illicit discharge (% effective)? Were there any times the equipment necessary to effectively trace an illicit discharge was not used because it was not available, was too costly to obtain, or not deemed a priority? Documenting the effectiveness of tracing techniques helps to evaluate how efficient the inspector is at the technique and if training is needed on where best to employ the technique.

Although completing an evaluation of the overall IDDE program may be time consuming and labor intensive, its benefits helps to reduce the costs for future inspection and IDDE efforts, which allows us to employ more efforts in other areas of the program. Keeping track of where illicit discharges are likely to occur and what techniques are useful can help lead to an effective identification program between Leeds and Storm Water members.

TABLE 2-13:
IDDE PROGRAM EVALUATION WORKSHEET

Priority Areas [1]	List any factors that have changed since initial priority was set [2]	Recommended Change (Circle) [3]	
A		Leave Priority Same	Re-evaluate
B		Leave Priority Same	Re-evaluate
C		Leave Priority Same	Re-evaluate

Detection Program [1]	# Mapping Inspections [4]		# Longer Term Inspections [4]		# Citizen Complaints [4]		# Opportunistic Inspections [4]	
Priority Areas	Identified	Resolved	Identified	Resolved	Identified	Resolved	Identified	Resolved
A								
B								
C								
Tracing Techniques Used [5]	Effective	Ineffective (Comment below)	Effective	Ineffective (Comment below)	Effective	Ineffective (Comment below)	Effective	Ineffective (Comment below)
Method:								
Method:								
Method:								

Comments/Recommended Changes [6]

Instructions: This worksheet is for Program Managers to evaluate their IDDE Program.

1. Fill in the names of the priority areas in your municipality.
2. List any factors that have changed since the initial prioritization (i.e. have additional illicit discharges been discovered in these areas, has a new 303(d) list come out naming new waterbodies as impaired, etc.).
3. Circle the applicable recommended change.
4. Fill in the number of illicit discharges identified and subsequently resolved for each detection mechanism used.
5. Fill in the different tracing techniques that were used (visual, sampling, sandbagging, OBM, dye/smoke testing, televising), and check whether they were effective or ineffective for each applicable detection mechanism that they were used for. If the method was ineffective, comment on why it was ineffective and how it could be improved.
6. Note any additional comments or recommended changes.

Chapter 3

III. POLLUTION PREVENTION AND GOOD HOUSEKEEPING

Many municipal activities can result in stormwater pollution if not conducted properly. Activities such as vehicle maintenance, fueling, and landscaping involve handling, storage, and use of chemicals and petroleum products that must be used properly to prevent stormwater from becoming polluted. In addition, construction activities conducted during general maintenance of infrastructure can result in sedimentation and erosion of soil that can be swept by stormwater into the storm drain system or directly into waterbodies.

a) *Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.*
b) *Include, at a minimum, maintenance activities for the following: parks and open space (areas such as public golf courses and athletic fields); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance, post-construction plans; and stormwater system maintenance.*
c) *Develop schedules for municipal maintenance activities described in paragraph (b) above.*
d) *Develop inspection procedures and schedules for long term structural controls.*

TABLE 3-1: GOOD HOUSEKEEPING/POLLUTION PREVENTION SOPS/ACTIVITY MATRIX				
SOP	**Vehicle/ Equipment Maintenance**	**Facilities Maintenance (including Parks and Open Space)**	**Storm Drain System Maintenance**	**Construction Activities and Other Land Disturbances**
B.1 Catch Basin Cleaning				
B.2 Storm Drain System Repair and Maintenance				
B.3 Erosion and Sediment Control				
B.4 Landscape Design and Management				
B.5 Storage and Disposal of Fertilizer and Pesticide				
B.6 Fertilizing and Turf Health Application				
B.7 Weed and Pest Control Application				
B.8 Mowing and Irrigation				
B.9 Vehicle and Equipment Storage				
B.10 Vehicle and Equipment Washing				
B.11 Vehicle and Equipment Fueling				
B.12 Spill Clean-up				
B.13 Parts Cleaning				
B.14 Spare Parts Storage				
B.15 Alternative Products Use/Storage/Disposal				
B.16 Petroleum and Chemical Disposal				
B.17 Petroleum and Chemical Handling				
B.18 Petroleum and Chemical Storage – Bulk				
B.19 Petroleum and Chemical Storage – Small Quantity				
B.20 Garbage Storage				
B.21 General Facility Housekeeping				
B.22 Floor Drains				
B.23 Painting				
B.24 Street Sweeping				
B.25 Snow Disposal				
B.26 Deicing Material Storage				
B.27 Deicing Material Application				

To address these components, this Chapter is divided into four subsections that describe four major categories of operations completed by each municipality:

- Vehicle/Equipment Maintenance (Section 3.1)
- Facilities Maintenance including parks and open space (Section 3.2)
- Storm Drain System Maintenance (Section 3.3), and
- Construction Activities (Section 3.4)

Each of these four operational areas contains a diverse set of activities, for which SOPs are appropriate. SOPs associated with each of these operational areas are contained in Appendix B. The SOPs outline the management and maintenance procedures that are used to minimize impacts on stormwater. Some of the SOPs apply to more than one operational area. For example, both vehicle maintenance and facilities maintenance require handling, storage, and disposal of petroleum products. Therefore, the SOPs for petroleum handling, storage and disposal in Appendix B address both of these operational areas. Table 3-1 shows the relationship between the SOPs that are contained in Appendix B and the operational areas that are described in this Chapter.

What is a "regulated contaminant"?

Leeds defines any regulated contaminant as "any physical, chemical, biological, radiological substance or other matter other than naturally occurring substances at naturally occurring levels, in water which adversely affects human health or the environment." The Material Safety Data Sheets (MSDS) should be consulted for the products you use; See disposal information in the "Spills or Leaks" Section of the MSDS.

3.1 VEHICLE AND EQUIPMENT MAINTENANCE

The SOPs related to vehicle maintenance have three basic structural components:

1) Store chemicals, wastes, and vehicles inside whenever possible to minimize their potential to pollute stormwater.
2) Handle with care to avoid spills. Preventing spills is the best way to minimize stormwater contact with chemicals and petroleum products.
3) Recycle whenever possible. When it is not possible to recycle, Use proper disposal procedures to ensure contact with stormwater is minimized.

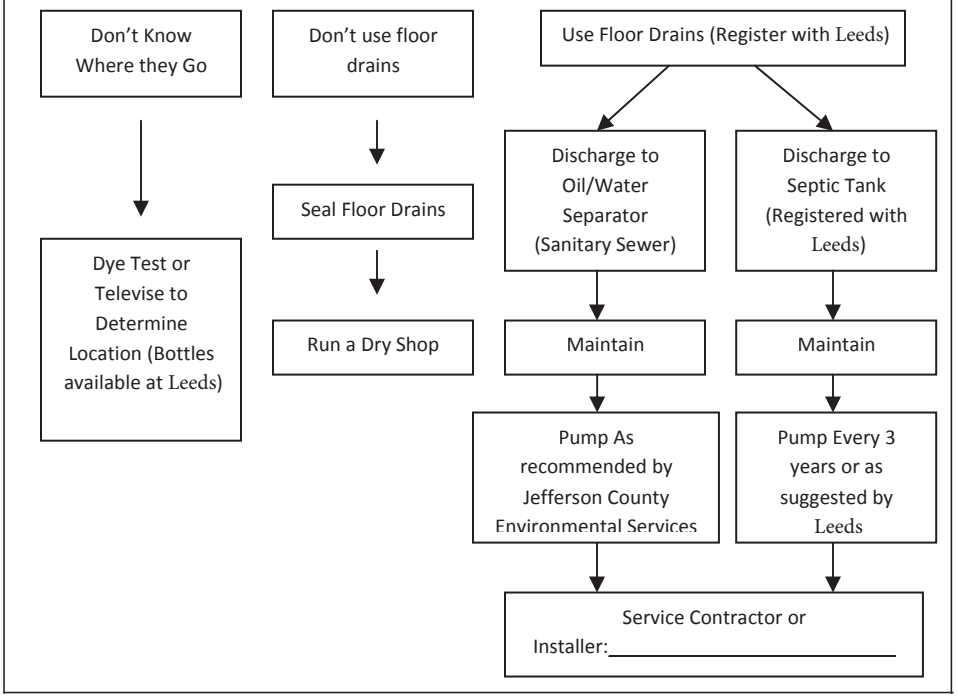
Seven common vehicle maintenance activities are described below. To assist each Storm Water members in understanding what are the best methods to protect stormwater from becoming polluted by these activities, a worksheet-style aid is being given by Leeds to each facility that provides for stormwater pollution prevention methods for each activity immediately following the description of that activity. It is recommended that each municipal employee become familiar with the

Leeds rules prohibit any discharge to the ground of non-domestic wastewater containing any regulated chemicals.

worksheets applicable for your facility and practice filling them out as you review this section.

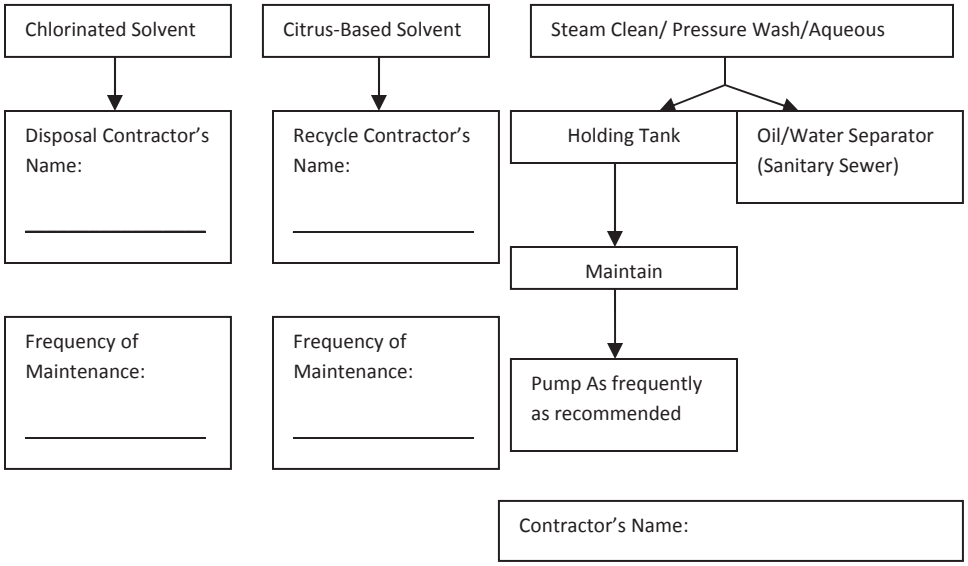
1. *Floor Drains*: Facility managers should be able to positively identify the discharge location of their floor drains. If the discharge location is unknown, it should be determined by visual inspections. Available methods to determine the discharge location include: televising or dye testing in which a bottle can be obtained from Leeds (see Section 2.5 for discussion of advantages and disadvantages of each method). Floor drains should either be connected to a regularly maintained septic tank or to a regularly maintained oil/water separator that discharges to the sanitary sewer. The facility should connect the floor drains to the appropriate device or close and seal the floor drains, and run a "dry shop". Public works facilities typically store or use "regulated contaminants" in the area served by the floor drain. Therefore, these floor drains must be closed, rerouted to the sanitary sewer via an oil/water separator, or rerouted to a septic tank registered with the Leeds (205)930-1230.

Figure 3-1 Floor Drain – Available Options
(circle the options that apply for your particular facility)



2. *Parts Cleaning*: Most vehicle maintenance facilities use one of three methods to clean parts: chlorinated solvents, citrus-based cleaners, or aqueous base cleaners. If chlorinated solvents are used, they should be disposed of as hazardous waste by a licensed hazardous waste contractor. Citrus based cleaners can be recycled by an off-site contractor reducing overall cost of its use. Steam cleaning or use of a commercial aqueous washer allows discharge to the sanitary sewer. Using non-hazardous chemicals reduces the risk of stormwater pollution.

Figure 3-2 Parts Cleaning- Available Options
(circle the options that apply for your particular facility)

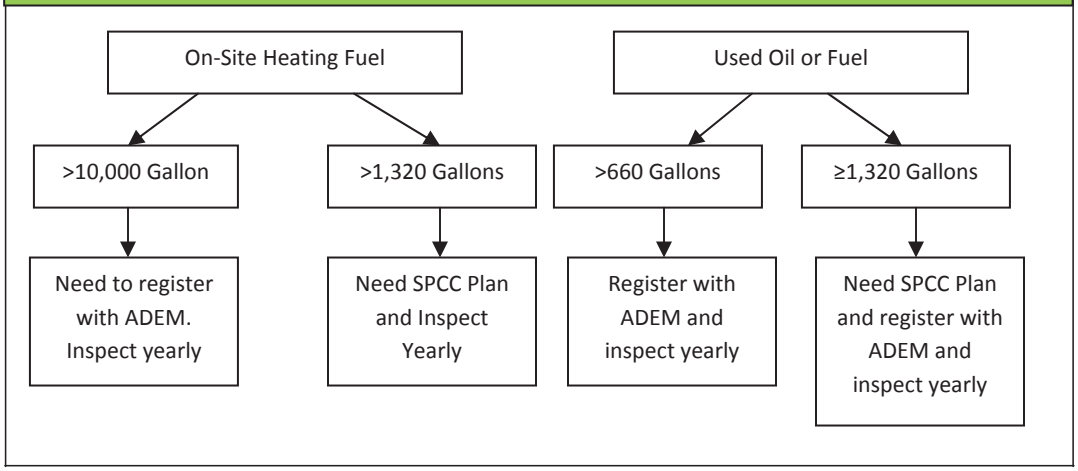


3. *Petroleum Storage*: ADEM regulates above-ground storage tanks (ASTs) when a facility is storing more than 660 gallons of used oil or fuel, or when a facility is storing more than 10,000 gallons of heating oil used for on-site heating. ADEM requires registration of ASTs and requires interstitial monitoring and double walls on all tanks. Federal regulations (40 CFR Part 112) require development of a Spill Prevention Control and Countermeasure Plan (SPCC) for facilities that store more than 1,320 gallons of any petroleum product. These regulations help protect stormwater by requiring regular inspections and development of spill prevention and clean-up procedures. Facility managers should understand and follow the regulations that apply to their facility.

To Register an AST

Call ADEM AST Program at (334)394-4399

Figure 3-3 Petroleum Storage-Available Options
(circle the options that apply for your particular facility)

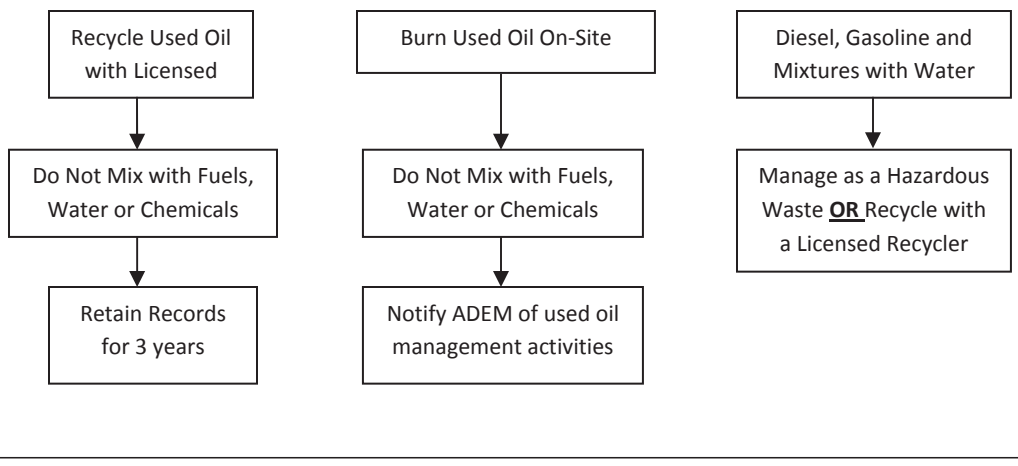


4. *Petroleum Disposal*: Proper disposal of petroleum products can minimize their impact on stormwater. Used oil can be recycled with a marketer who has registered with the ADEM. Used oil can also be burned on-site by a municipality for energy recovery as long as the oil has not been mixed with any other fuels or chemicals. Municipalities must notify ADEM of their used oil management activities if they are burning used oil on-site. Other wastes generated should be managed as follows:
   - Diesel fuel and gasoline, or any mixture of oil and water, must be managed as hazardous waste and should not be mixed with used oil.
   - Sludge from floor drains should be analyzed for Toxicity Characteristics Leaching Procedure (TCLP) prior to disposal to determine if it is hazardous waste.
   - Residual solids from oil spills may be managed as solid waste, unless the residuals are from a volatile fuel such as gasoline. Volatile fuel residuals must be managed as a hazardous waste.

Municipalities burning used oil onsite must register with ADEM

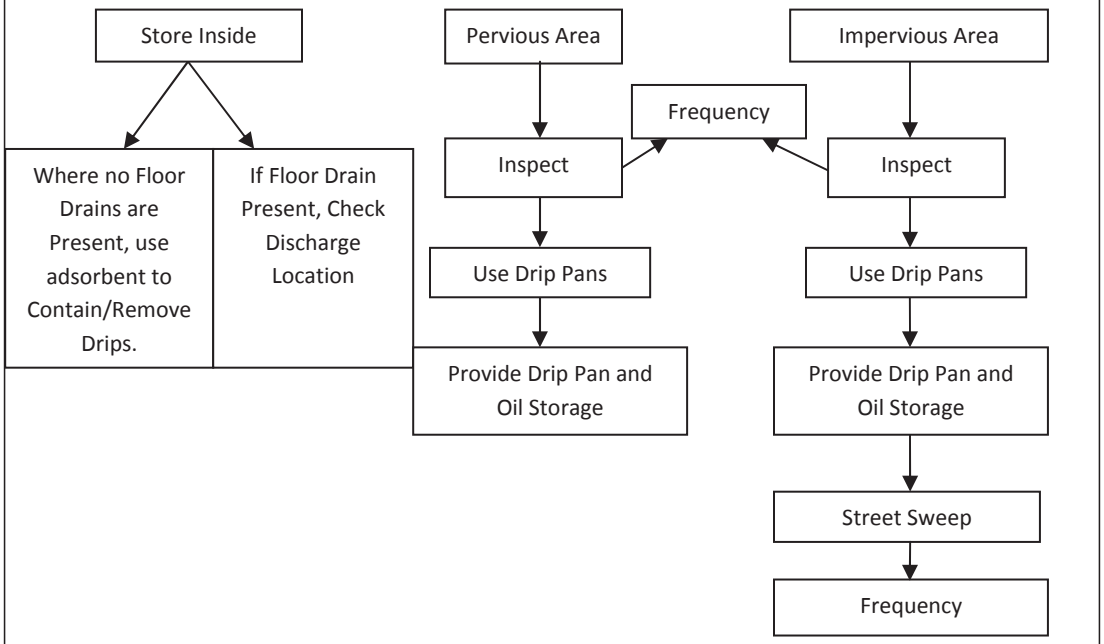
(334)271-7730

Figure 3-4 Petroleum Disposal - Available Options
(circle the options that apply for your particular facility)



5. *Vehicle Storage*: Vehicles should be stored indoors in an area where there are no floor drains or where any floor drains have been properly connected and registered (see above). If vehicles cannot be stored indoors, they can be stored on impervious areas that are inspected on a regular basis and which can be cleaned with a street sweeper as necessary. Vehicles can be stored on pervious (unpaved) areas that are inspected on a regular basis to assess if drip pans are necessary. Drip pans should always be used to collect leaking fluids. A dedicated, convenient storage area should be provided and clearly labeled for the drip pans and for the fluids they will contain. Leaking vehicles should be repaired as soon as practical to minimize stormwater pollution.

Figure 3-5 Vehicle Storage – Available Options
(circle the options that apply for your particular facility)



To Register a Car Wash Facility:

Call ADEM at (334) 271-4367 or for any other questions call Leeds at (205)930-1230

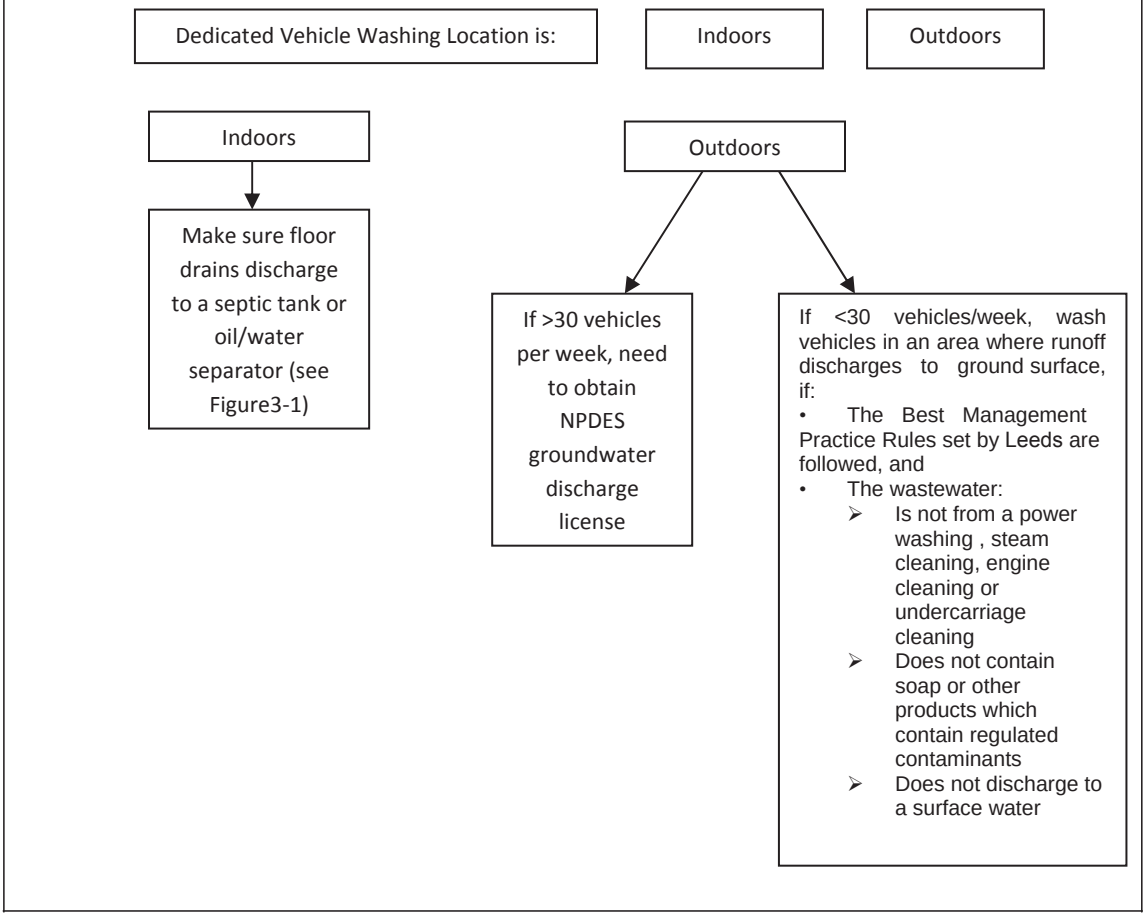
6. *Vehicle Washing:* If vehicles are washed regularly onsite, they should be washed in a dedicated area. The area can be:
   1) Indoors, if the washwater is discharged to floor drains that are properly connected to the septic tank or the sanitary sewer (See Figure 3-1),
   2) Outdoors; however if you wash more than 30 vehicles per week you must obtain a NPDES Groundwater Permit from ADEM, or
   3) Outdoors if you wash fewer than 30 vehicles per week and discharge to the ground surface, if:

To register a vehicle washing activity (when less than 30 vehicles per week):

Contact Leeds Stormwater Division at (205)930-1230

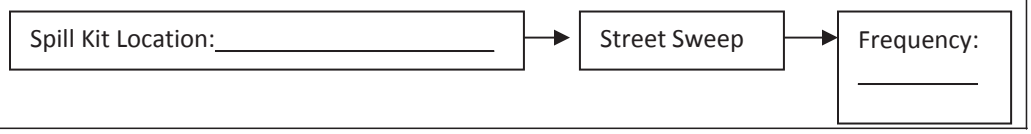
- The Best Management Practice Rules are followed,
- The activity is registered with Leeds or ADEM, and
- The wastewater is not from power washing, steam cleaning, engine cleaning, or undercarriage cleaning or does not contain soaps or other products which contain regulated contaminants.
- Does not discharge to a surface water or storm inlet

Figure 3-6 Vehicle Washing – Available Options
(circle the options that apply for your particular facility)



7. *Vehicle Fueling*: Vehicle fueling areas are a significant generation point for petroleum contamination of stormwater. Vehicle fueling areas should be impervious surfaces, and should be inspected and swept with a street sweeper on a regular basis. A spill kit and covered garbage container should be located near the fueling area and should be well labeled for individuals to use when needed.

Figure 3-7 Vehicle Fueling – Available Options
(Circle the options that apply for your particular facility)



An important component of stormwater protection at vehicle and equipment maintenance facilities is general good housekeeping. Conducting regular inspections of a facility can be an effective pollution prevention technique. The following is a list of areas facility Managers should consider when developing their own inspection checklist:

1) Check refuse areas for trash on the ground that could contaminate stormwater.
2) Check exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt. Consider if street sweeping is necessary and if drip pan use is acceptable.
3) Check fueling areas for leaks, spills, or drips.
4) Check exterior petroleum storage areas for leaks, spills, or drips.
5) Check or clean-up of tracked sand and/or salt.
6) Check calcium chloride tank for leaks, spills, or cracks.
7) Check vehicle washing area for excess sediment and wastes.
8) Check oil/water separator in floor drain system to ensure it is functioning, and clean if necessary.
9) Clean catch basin grates around facility for entering stormwater.

Table 3-2 is an example inspection checklist that should be used on a regular (monthly or quarterly) basis to identify areas of potential stormwater pollution. Table 3-2 contains a blank form that the Facility Manager should fill in for their facility and return to the governing municipal official as soon as practical. These forms will be used to track the stormwater duties performed by each facility for the Storm Water's annual report.

TABLE 3-2:

EXAMPLE INSPECTION CHECKLIST

Municipality:_____ **Facility Manager:**_____

Date: _____ **Inspector:** _____

Inspection Area	Practice Followed	Comments	Date Resolved (if applicable)
Check refuse areas for trash on the ground that could contaminate stormwater or be washed away in stormwater	Acceptable/Needs Attention		
Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Street sweeping necessary?	Acceptable/Needs Attention		
Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Drip pan use acceptable?	Acceptable/Needs Attention		
Check fueling areas for leaks, spills or drips	Acceptable/Needs Attention		
Check exterior petroleum storage areas for leaks, spills, or drips	Acceptable/Needs Attention		
Clean-up of tracked sand that might allow stormwater transport of sand	Acceptable/Needs Attention		
Clean-up tracked salt that might result in stormwater transport	Acceptable/Needs Attention		
Check calcium chloride tank for leaks, spills or cracks	Acceptable/Needs Attention		
Check vehicle washing area for excess sediment or wastes	Acceptable/Needs Attention		
Other:	Acceptable/Needs Attention		
Other:	Acceptable/Needs Attention		

Instructions: This form needs to be used for regular (quarterly) inspections at vehicle/equipment maintenance facilities. Program Managers should fill in the areas to be inspected for their facilities (refer to Section 3.1 and Table 3.2 Example Inspection Checklist). When the checklist is used during an inspection, the inspector needs to fill in the date as well as his/her name, circle either "Acceptable" or "Needs Attention", and note comments for each inspection area.

3.1 FACILITIES MAINTENANCE

The City of Leeds owns and maintains its own buildings, parks, and other green spaces. The City has its own maintenance staff to perform general maintenance activities that include mowing and trimming, painting, pest control, weed control, and all of the chemical and petroleum handling that is associated with these activities. The SOPs contained in Appendix B provide best management practices to protect stormwater from the potential hazards associated with each of these maintenance activities. Facilities maintenance personnel should be trained in each of the SOPs associated with their job by their respective cities or Leeds.

In addition to training municipal employees on the SOPs in Appendix B that affect their jobs, a formal street sweeping program can reduce pollutant loads from road salt and can reduce sand export to receiving waters. Street sweeping also reduces the amount of sediment, debris, and organic matter being washed away by stormwater. A street sweeping schedule will need to be kept similar to the one shown in Appendix B and presented to Storm Water.

USEPA does not recommend how frequently a community should sweep, but most sweeping of municipal lots and roadways should be performed at least once per year. An appropriate schedule for street sweeping should be determined based on each municipality's specific needs. Heavy traffic areas can be swept weekly or monthly, depending on a community's available resources. Other locations, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas should be swept on an as needed basis.

The State of Alabama has no formal standards that would not allow municipalities to reuse street sweepings in accordance with the Environmental Fact Sheet shown below . Street sweepings may be reused as long as they do not contain visual evidence of wastewater, animal wastes, oil or other petroleum products. Catch basin residuals must be tested to determine if they may be reused. Table 3-4 lists the compounds, the S-1 limits which allow unrestricted reuse, and the S-3 limits which allow reuse as a road base or subbase. Visually contaminated street and catch basin residuals must also be tested to determine if they contain hazardous wastes.

Table 3-4 Soil Standards Catch Basin Cleanings Reuse Guidance			
Maximum Contaminant Concentrations			
Regulated Contaminant	*S-1 Standards (mg/kg)*	*S-3 Standards (mg/kg)*	*USEPA SW-846 Test Method*
Metals			
Arsenic	11	11	6010B
Barium	750	3,400	6010B
Cadmium	32	230	6010B
Chromium	1000	5,000	6010B
Lead	400	400	6010B
Mercury	13	13	7471A
Selenium	260	260	6010B
Silver	45	200	6010B
VOCs			
Benzene	0.3	0.3	8260B
Dichloroethane, 1,2-	0.08	0.08	8260B
Isopropyl benzene	123	123	8260B
Methyl-t-butyl ether	0.13	0.13	8260B
Toluene	100	100	8260B
Xylene	500	1,100	8260B
Aklylbenzenes Butylbenzene, n- Butylbenzene, sec- Butylbenzene, tert- Isopropyl toluene, 4- Propylbenzene, n- Trimethylbenzene, 1,2,4- Trimethylbenzene, 1,3,5-	59 (total)	59 (total)	8260B
PAHs - Carcinogenic			
Benzo(a)anthracene	0.7	40	8270C
Benzo(a)pyrene	0.7	4	8270C
Benzo(b)fluoranthene	7	400	8270C
Benzo(k)fluoranthene	7	400	8270C
Chrysene	70	4,000	8270C
Dibenzo(a,h)anthracene	0.7	4	8270C
Indeno(1,2,3-cd)pyrene	0.7	40	8270C
PAHs – Noncarcinogenic			
Acenaphthene	270	270	8270C
Acenaphthylene	300	300	8270C
Anthracene	1,000	1,700	8270C
Fluoranthene	810	5,000	8270C
Fluorene	510	510	8270C
Methylnaphthalene,2-	150	150	8270C
Napthalene	5	5	8270C
Benzo(g,h,i)perylene Phenanthrene Pyrene	480 (total)	5,000 (total)	8270C

3.2 STORM DRAIN SYSTEM MAINTENANCE

Storm drain system maintenance consists of three components: cleaning, repairing (or retrofitting), and upgrading. Historically, storm drain systems have been repaired or upgraded only when catastrophic failures have occurred, such as those causing flooding, road failures, or severe erosion. The General Permit requires that each Storm Water regulated member develop a maintenance schedule for the storm drain system, as well as inspection procedures and schedule for long term control structures. The storm drain mapping currently being performed by Leeds will be presented to each city upon completion The estimated time frame with current resources should be able to meet the five years required from October 1, 2010. The completion date will hopefully be sooner through cooperative programs with the municipality fire departments and other agencies. This will allow for cities to make better estimates on where to expend fiscal resources to get the biggest impact on Storm Water infrastructure instead of the as-needed maintenance system in place now.

Conveyance System Maintenance

Section 2.2 of this Manual reviews how Leeds divides a municipality into distinct areas and prioritizes the areas based on their illicit discharge potential. A future component of that evaluation will be to consider the age and material of the infrastructure, which is an indicator of failure potential. This prioritization can be used in the future to aid in developing a maintenance program for the system.

Additional useful resources include the municipal capital budget and the GASB 34 accounting information. All of these items should be reviewed and evaluated to identify where and when repairs, retrofits, and upgrades should be conducted. The storm drain system maintenance program can be developed using a process that is similar to the local pavement management program. The following paragraphs provide guidance to city managers in developing an operation and maintenance program.

1) Vitrified clay (terracotta) storm drain pipe, asbestos cement pipe, or corrugated metal pipes in older areas should be replaced or retrofitted as part of other infrastructure work (street reconstruction, or combined sewer overflow (CSO) work). Televising and/or manual inspections should be performed to confirm the degree of repair or replacement necessary.
2) An inspection and replacement program should be developed for newer pipes and structures in order to

conduct preventative maintenance that can affect long-term cost savings and avert catastrophic failures. The inspection and replacement program should consist of the following items:

- Storm Drain Pipe/Outfall Cleaning and Inspections – A cleaning and inspection prioritization should be established by all municipalities for storm drain pipes and outfalls. The City Manager should consider conducting annual inspections on storm drains and outfalls in high priority areas. Less frequent inspections (every 2 to 3 years) should be completed for medium and low priority areas. Inspections for structural conditions should be combined with the inspections for illicit discharges as described in Section 2.4.2. Leeds is helping to aid municipalities in this endeavor through the mapping of the storm drain and outfalls by providing information on the condition and sedimentation loading of each pipe.
- Catch basin Cleaning and Inspection – A prioritization plan should also be established for catch basin cleaning. The prioritization can be completed by the City Manager using the following two considerations: (1) amount of winter sand spread in different areas (this will be zero for most cities but should still be included in the plan), and (2) areas that have historically accumulated a large quantity of sediment or debris. This prioritization should be reviewed and updated frequently. The re-evaluation should use the same two criteria listed above (sand application and historical sediment accumulation). City Managers should identify a reasonable frequency of cleaning based on need, municipal budgets, and personnel availability. Leeds and Jefferson County can provide some assistance to cities without their own capabilities.

  The Catch Basin Cleaning Form contained in Appendix A , should be used during cleaning as a method to inspect the catch basins to evaluate the integrity of the structure and identify necessary repairs. Any repairs identified on the forms should be incorporated into the municipality's work order system. Communities that outsource catch basin cleaning should either require that the contractor use the inspection form or should consider sending a

public works employee, intern, or other municipal representative along with the contractor to evaluate structures. This form will be used by Storm Water and Leeds to estimate the effectiveness of the program so all forms should be completed and given to the relevant agency.

- Ditches and Swales Maintenance - Many Storm Water members have rural areas, where the storm drain system consists of roadside ditches. Sediment, grass clippings, winter sand, leaves, excess vegetation and other debris periodically impedes the proper function of these ditches and should be removed approximately annually. Ditch cleaning can be conducted manually or using heavy equipment. Ditch cleaning should be conducted during low water periods, minimizing the disturbance to existing vegetation. If existing vegetation is removed during ditch cleaning, the ditch side slopes should be seeded and mulched as soon as possible after dredging. Ditch cleaning with heavy equipment should not be conducted in areas where the ditch carries a perennial stream unless specifically approved by the Army Corp of Engineers. Pesticide use should also be kept to a minimum in these sensitive areas due to their direct impact on waterways.

3.3.1 Long Term Control Structure Inspection and Maintenance

In addition to the storm drain pipes, catch basins and outfalls, long term control structures such as detention ponds, vegetated filter strips, grass swales, and constructed wetlands must be inspected and maintained.

ADEM produces a BMP Manual that tells the design features for these BMPS that must be maintained. Leeds is working on a Manual that will tell the frequency of maintenance needed for these devices and is targeted for release in August 2012. The following table 3-5 provides recommended maintenance requirements from *NHDES BMPs for Urban Stormwater Runoff* to provide some general guidance until the manual can be released.

TABLE 3-5:
RECOMMENDED MAINTENANCE ON COMMON LONG-TERM STORMWATER BMPS

Structure Type	Maintenance Requirements
Extended Detention Pond (Dry)	The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill are present. Trees and shrubs should be kept off the embankment and emergency spillway areas. The vegetation should be mowed once per year to discourage woody growth. Vegetation should be managed without the aid of fertilizers. If vegetation is sparse or non-existent, test soils for proper nutrients/growing conditions and re-vegetate with drought-tolerant. Pipe inlets and outlets should be inspected annually and after major storm events. Sediment should be continually checked in the basin and removed as necessary. The structure should be inspected by a qualified professional on a periodic basis.
Vegetated Filter Strips	A properly designed and constructed filter strip should require little maintenance. It should be inspected frequently during the first year of operation and then annually thereafter. Large accumulations of sediments should be removed, and all gullies filled in and stabilized. Areas of bare soil should be immediately stabilized.
Grassed Swales	Swales should be mowed at least once per year to prevent the establishment of woody vegetation. Sediments should be removed as required and swale reseeded if necessary. Grass should not be mowed to less than three inches in height.
Wet Ponds and Constructed Wetlands*	The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill are present. Trees and shrubs should be kept off the embankment and emergency spillway areas. The vegetation should be mowed once per year to discourage woody growth. Vegetation should be managed without the aid of fertilizers. Inspect vegetation for invasive species annually and remove if present. Supplement wetland plants if <50% surface is bare. Harvest wetland plants that have been “choked out” by sediment buildup. Pipe inlets and outlets should be inspected annually and after major storm events. Sediment should be continually checked in the basin and removed as necessary. The structure should be inspected by a qualified professional on a periodic basis.

**NOTE: Source of information for Constructed Wetlands is USEPA manual of BMPs.*

Table 3-6

LONG TERM STRUCTURAL CONTROL INSPECTION FORM

PROJECT NAME:		**CITY:**
LOCATION:		**INSPECTOR NAME:**
OWNER:		**DATE:**
ADDRESS:		**DATE OF LAST INSPECTION:**
PHONE #:		
CONTACT:		
BMP ID:		
BMP TYPE:	WET RETENTION POND	
ENGINEER OR DESIGNER:		
ADDRESS:		
CONTACT:		
PHONE #:		

MAINTENANCE INFORMATION

MAINTENANCE:

COMMENTS:

Storm Water Management Authority, Inc.

1400 SIXTH AVENUE SOUTH. P.O. BOX 2648. BIRMINGHAM, ALABAMA 35202. (205)930-1230

Storm Water Structural Control Form (Municipal Use)

FORM

Part 1: General Information

Stormwater Municipality: _____ Date: ___
Mayor: _____
Contact Person: _____

Part 2: Existing Storm Water Structural Controls

Estimated Miles of Storm Sewer Inspected: ___ miles
Estimated personnel time spent inspecting: ___ hrs
Structural Controls Fixed:
___ estimated # of detention ponds
___ estimated # of retaining walls
___ estimated # of ditches repaired
___ estimated # of head walls repaired
___ estimated # of retention ponds

Part 3:New Storm Water Structural Controls

Estimated Miles of New Storm Sewer Installed: ___
Estimated Personnel time during installation: ___
Structural Controls Installed:
___ estimated # of detention ponds
___ estimated # of retaining walls
___ estimated # of ditches repaired
___ estimated # of head walls repaired
___ estimated # of retention ponds

If structural controls are cleaned or maintained by an outside entity (Jefferson County, State of Alabama, etc..) then contract with outside entity should be stabled to this form when returned.

City of Leeds

1400 9th St, Leeds, AL 35094 - development@leedsalabama.gov 205.699.2094

Development Form for Storm Water Structural Controls

Submit in Triplicate

Application

Part 1: General Information

Stormwater Municipality: _____ Date: _____

Applicant's Name _____

Applicant's email address/ Phone number: _____

Applicator Company Name: _____

Mailing Address: _____ City _____

State: _____ Zip: _____

Type of Development _____

Part 2: Engineering Information

I, _____, a _____ do hereby certify that the data stated in this report and/or attached sheets are true and accurate as presented.

Signature:_____ Date: _____ Reg. # _____

Address:_____ City:_____ State:_____ zip:_____ Phone: ___

Part 2: Storm Water Structural Controls Installed

Estimated Distance of New Storm Pipe Installed: _____ Ft.

Structural Controls Installed:

_____ estimated # of detention ponds

_____ estimated # of retaining walls

_____ estimated # of ditches repaired

_____ estimated # of head walls repaired

_____ estimated # of retention ponds

Estimated Area of Detention Ponds:

1	6
2	7
3	8
4	9
5	10

Estimated Area of Retention Ponds:

1	6
2	7
3	8
4	9
5	10

Are there any other structures used for stormwater management if so explain: _____

3.4 CONSTRUCTION ACTIVITIES AND OTHER LAND DISTURBANCES

As the city performs construction activities and other activities which disturb soil, they take precautions to prevent erosion and runoff of sediment. Road crews and landscaping crews are being trained in erosion and sediment control methods. Leeds is creating publications and training sessions that describe a variety of methods that can be used to reduce the long term impact of sedimentation and erosion on water quality. The material for the city should be available by June 2011 and in video form sometime thereafter. The city is responsible for making sure any new hires are trained using the video material as well as a refresher course is offered for each existing employee on an annual basis. Erosion and Sedimentation
Control SOPs are listed in Appendix C.

4. GLOSSARY OF ACRONYMS

ADEM Alabama Department of Environmental Management

AST Aboveground Storage Tank

AU Assessment Unit

BMP Best Management Practice

CWP Center for Watershed Protection

GASB General Accounting Standards Board

GIS Geographic Information System

GPS Geographic Positioning System

HUC Hydrologic Unit Code

Leeds Jefferson County Department of Health

IDDE Illicit Discharge Detection and Elimination

IDP Illicit Discharge Potential

MEP Maximum Extent Practical

MCM Minimum Control Measure

MSDS Material Safety Data Sheet

MSGP Multi Sector General Permit

MS4 Municipal Separate Storm Sewer System

NEIWPCC New England Interstate Water Pollution Control Commission

NOV Notice of Violation

NPDES National Pollutant Discharge Elimination System

NRCS National Resource Conservation Service

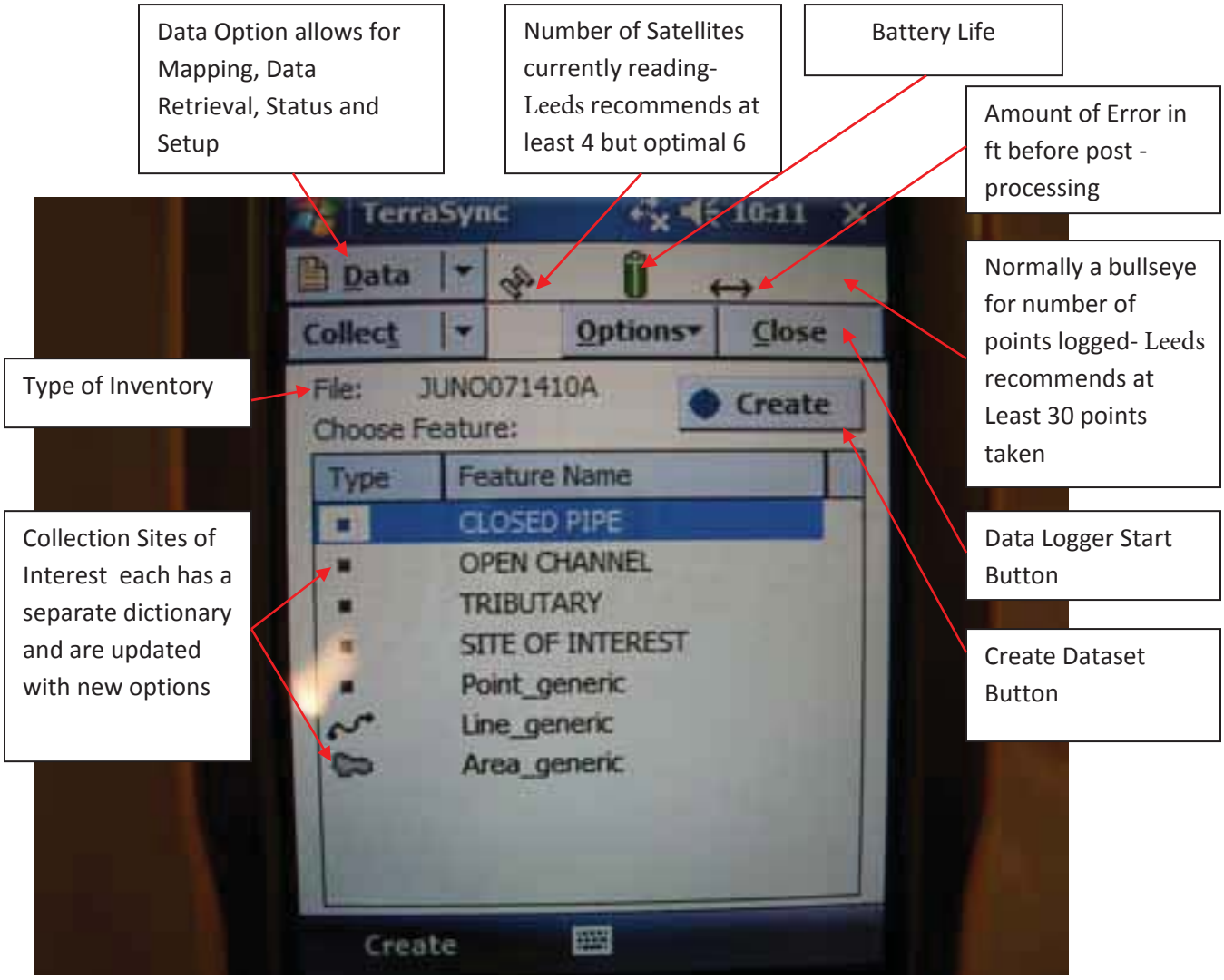
OBM Optical Brightener Monitoring

PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
SIC	Standard Industrial Classification
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasure
TCLP	Toxicity Characteristics Leaching Procedure
TMDL	Total Maximum Daily Load
UNH	University of New Hampshire
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

APPENDIX A

ILLICIT DISCHARGE DETECTION AND ELIMINATION SOPS AND FORMS

TYPICAL GPS SCREEN EXPLANATION



Standard Operating Procedure for:	
A.1 IDDE: Inspections During Mapping	
Purpose of SOP:	This SOP provides a basic checklist for Leeds employees conducting illicit discharge inspections during mapping.

Always:

1) Characterize the outfall by recording information on the Tremble Nomad Unit data dictionary such as:
   - Side of creek
   - GPS location (at least 30 points to post process)
   - Flow present
   - Flow description
   - Material of pipe
   - Shape
   - Diameter, horizontal distance, vertical distance
   - Number of pipes
   - Submerged pipe
   - Sediment filled
   - pH
   - temperature
   - picture of all pipes
2) Conduct inspections during dry weather periods using the Dry Weather Outfall Inspection Form or data dictionary shown on the next page if a problem outfall is believed to be discovered
3) Follow procedure below if an illicit discharge is encountered (such as raw sewage, paint, etc.).
4) Conduct inspections with at least two Leeds employees per crew.
5) Carry a list of emergency phone numbers.(All Leeds inspectors are equipped with cell phones)
6) Have on JCDH badge at all times

Whenever Possible:

1) Conduct inspections during low groundwater and leaf off conditions.
2) Identify and label the outfall with a unique identifier if outfall is believed to be a problem.
3) If dry weather flow is present at the outfall, and the flow does not appear to be an illicit discharge attempt to identify the source of the flow (intermittent stream etc.), then document the discharge for future comparison.
4) Collect samples of flowing discharges before and after source removal.

Never:

1) Never put yourself in danger.
2) Never enter private property without permission

Figure 1: Tremble Nomad Unit

Dry Weather Discharge

The CWP defines **dry weather** as a 48 hour period with no runoff-producing rainfall. JCDH prefers the period to be 72 hours but if continual rain occurs that will be switched to 48 hours as needed.

Equipment list for mapping:

1. Entrance and Exit Point Map
2. GPS unit with built in camera
3. Field sheets for any illicit discharge found (can be left in truck)
4. Cell phones
5. pH meter
6. First aid kit
7. Flash light or head lamp
8. Surgical gloves
9. Tape measure
10. Temperature probe
11. Waders
12. Watch with a second hand
13. Hand sanitizer
14. Sampling pole
15. Safety vests

Leeds Procedure for illicit discharge detection

- Call supervisor and notify of location
- Take photos and record under Site of Interest in data dictionary on GPS unit as shown below
- Supervisor carries out sample bottles to be taken to lab for a rush sample
- Area is then visually inspected for the possible sources.
- If no source can be identified then wait for sample results to come back to see what possible contaminants are. At this point a further investigation will be launched. This can include but is not limited to 24 hour ISCO sampling, damming, etc.

Dry Weather Outfall Inspection Form

Location Information

Date: _____ **Inspector:** _____

Time: _____

Outfall ID: _____

Outfall Location: _____

Receiving Waterbody: _____

Photo Taken: Yes No **Photo ID:** _____

Weather: Clear Cloudy **Approximate Temp:** _____ **Wind Present:** Yes No

Precipitation in the past 3 days: No Yes _____ inches

Pipe Flow: None Trickle Steady 1/4 pipe flow or more

Seepage Flow: None Trickle Steady 1/4 pipe flow or more

Color (if flow is present): _____

Inspection Information *Select all that are applicable*

Obvious Debris/Pollution:		**Odor:**		**Water Clarity:**	
None	0	None/Natural	0	Clear	0
Foam	3	Musty	5	Cloudy	5
Staining	5	Sewage/septic	10		
Floating Green Scum	8	Petroleum	10	Opaque	10
Oil / Film	9				
Vegetative Mat/or Gray Mat	9				
Sewage Solids	10				
TOTAL		**TOTAL**		**TOTAL**	

GRAND TOTAL SCORE =

Additional Information

Sediment Condition: Open 1/4 Full 1/2 Full 3/4 Full Plugged

Structure Condition: Excellent Good Fair Poor

Trash/litter present: Yes No **Yard waste observed:** Yes No

General Comments:

Potential Sources / Actions Taken:

Sample collected? Yes No

By whom? _____

Follow up required: Yes No

Parameters: **Results:**

Be sure to staple all relevant lab tests and assigned GPS points and photos to sheet during investigation.

NOTE: This information is to accompany the Dry Weather Outfall Inspection Form.

Odor – Most strong odors, especially gasoline, oils, and solvents are likely associated with high responses on the toxicity screening test.

Stale sanitary wastewater: sewage
Detergent, perfume: Laundromat or household laundry
Sulfur ("rotten eggs"): industries that discharge sulfide compounds or organics (meat packers, canneries, dairies)
Oil and gas: facilities associated with vehicle maintenance or petroleum product storage (gas stations) or petroleum refineries
Rancid-sour: food preparation facilities (restaurants, hotels)

Color – Important indicator of inappropriate industrial sources. Dark colors, such as brown, gray, or black are the most common.

Yellow: chemical plants, textile, and tanning plants
Brown: meat packers, printing plants, metal works, stone and concrete, fertilizers, and petroleum refining facilities [note: can be from natural organic acids if a wetland is upstream]
Green: chemical plants, textile facilities
Red: meat packers [note: can be from organic acids if a wetland is upstream]
Gray: dairies

Turbidity – The cloudy appearance of water caused by the presence of suspended or colloidal matter. In dry weather, high turbidity is often a characteristic of undiluted industrial discharges.

Cloudy: sanitary wastewater, concrete or stone operations, fertilizer facilities, automotive dealers
Opaque: food processors, lumber mills, metal operations, pigment plants

Floatable matter – a contaminated flow may contain floating solids or liquids directly related to industrial or sanitary wastewater pollution. Floatables of industrial origin may include animal fats, spoiled food, oils, solvents, sawdust, foams, packing materials, or fuel.

Oil sheen: petroleum refiners or storage facilities and vehicle service facilities. [note: there is a type of bacteria that looks like an oil sheen. If you take a stick and swirl around the sheen, it will break up into blocky pieces if it is the bacteria. A true oil sheen will quickly re-form and not look blocky.]
Toilet paper bits, fecal bits, food particles: sanitary wastewater
Soap suds: if white or a clear sheen, laundry discharge (check odor) [note: can also occur from natural surfactants; usually off-white or tan with an earthy-fishy odor.]

Deposits and Stains – Any type of coating near the outfall, usually a dark color. Deposits and stains will often contain fragments of floatable substances.

Lots of sediment: construction site erosion, sand and gravel pits, winter road applications
Oil stain: petroleum storage, vehicle service facilities, petroleum refineries
Rusty: precipitates from iron-rich water (natural or industrial) [note: if slimy and clumpy, it could be iron bacteria]
Grayish-black deposits and hair: leather tanneries
White crystalline powder: nitrogenous fertilizer waste

Vegetation – Vegetation surrounding an outfall may show the effects of industrial pollutants. Decaying organic materials coming from various food product wastes would cause an increase in plant life, while the discharge of chemical dyes and inorganic pigments from textile mills could noticeably decrease vegetation. It is important not to confuse the adverse effects on high Storm Water flows on vegetation with highly toxic dry-weather intermittent flows.

Excessive growth: food product facilities, fertilizer runoff (lawns, golf courses, and farms)
Inhibited growth: high Storm Water flows, beverage facilities, printing plants, metal product facilities, drug manufacturing, petroleum facilities, vehicle service facilities, and automobile dealers

Damage to Outfall Structures – Outfall damage can be caused by severely contaminated discharges that are very acidic or basic in nature. Primary metal industries have a strong potential to cause outfall structure damage because their batch dumps are highly acidic. Poor construction, hydraulic scour, and old age can also negatively affect the condition of al outfall structure.

Concrete or spalling (breaking off into chips or layers): industrial flows
Peeling paint: industrial flows
Metal corrosion: industrial flows

This sheet was courtesy of the NHDES (modified from Pitt et al., 1993 Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: a User's Guide. EPA Office of research and Development, EPA/600/R-92/238).

Data Dictionary Screen Shots Typical Example

The data dictionary is used on the GPS units to allow for easy waterproof form carrying. The options can be changed and the screen shots presented are just a sample of what Leeds is using currently. This helps to keep the paper forms like the ones above strictly for documentation purposes.

Options:

- Closed Pipe
- Open Channel
- Tributary
- Site of Interest

Opening Screen for Oufall Monitoring

Option chose (Closed Pipe)
Secondary Options:

- Side of Creek
- Flow Present
- Flow Type
- Flow Description
- Pipe Material
- Shape
- Vertical Diameter

Closed Pipe Outfall (Page 1)

Option chose (Closed Pipe)
Secondary Options:

- Horizontal Diameter
- Number of Pipes
- Submerged
- Sediment Filled
- Comments
- Temperature
- pH

Closed Pipe Outfall (Page2)

Option chose (Closed Pipe)
Photo Attachment Options:

- Photo 1
- Photo 2

Closed Pipe Outfall (Page3)

Site of Interest:

- Description
- Side of Creek
- Comments
- Photo

Site of Interest for logging Illicit or Suspicious Discharges

Standard Operating Procedure for:	
A.2 IDDE: Long-Term Inspections –Dry Weather	
Purpose of SOP:	To provide supervisor and field crew with a punch list of things to remember during regularly scheduled inspections.

Always:

1) Conduct inspections during dry weather periods (48-72 hours after rain event).
2) Check the outfall's dimensions, shape, and component material using the GPS data dictionary with the existing site name in the data dictionary
3) Characterize and record observations on basic sensory and physical indicators (e.g., odor, color, oil sheen).
4) If an illicit discharge is encountered (such as raw sewage, paint, etc.), follow the procedure below.
5) Perform inspections so as to meet Leeds' goal of inspecting each outfall within the 5 year permit cycle (long term).
6) Take pictures in the data dictionary for later inspections and GIS maps.
7) Always have on Leeds badge when doing inspections

Whenever Possible:

1) Identify and label the outfall with a unique identifier. For example "SWO-013".
2) If dry weather flow is present at the outfall, and the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (intermittent stream, etc.) then document the discharge for future comparison.
3) Collect samples before and after source removal.

Never:

1) Never put yourself in danger.
2) Never enter private property without permission.

Leeds Procedure for illicit discharge detection

- Call supervisor and notify of location
- Take photos and record under Site of Interest in data dictionary on GPS unit as shown below
- Supervisor carry out sample bottles to be taken to lab for a rush sample
- Area is then visually inspected for the possible sources.
- If no source can be identified, wait for sample results to provide information on possible contaminants. At this point a further investigation will be launched. This can include but is not limited to 24 hour ISCO sampling, damming, etc.

Standard Operating Procedure for:	
A.2 IDDE: Long-Term Inspections –Wet Weather	
Purpose of SOP:	To provide supervisor and field crew with a punch list of things to remember during regularly scheduled inspections.

Always:

8) Conduct inspections during flow events, or as close to a rain event as possible. (no longer than 6 hours)
9) Check the outfall's dimensions, shape, and component material using the GPS data dictionary with the existing site name in the data dictionary
10) Characterize and record observations on basic sensory and physical indicators (e.g., odor, color, oil sheen).
11) If an illicit discharge is encountered (such as raw sewage, paint, etc.), follow the procedure below.
12) Perform inspections so as to meet JCDH's goal of inspecting each outfall within the 5 year permit cycle (long term).
13) Take pictures in the data dictionary for later inspections and GIS maps.
14) Always have on JCDH badge when doing inspections

Whenever Possible:

4) Identify and label the outfall with a unique identifier. For example "SWO-013".
5) Collect samples before and after source removal.

Never:

3) Never put yourself in danger.
4) Never enter private property without permission.

JCDH Procedure for illicit discharge detection

- Call supervisor and notify of location
- Take photos and record under Site of Interest in data dictionary on GPS unit as shown below
- Supervisor carry out sample bottles to be taken to lab for a rush sample
- Area is then visually inspected for the possible sources.
- If no source can be identified, wait for sample results to provide information on possible contaminants. At this point a further investigation will be launched. This can include but is not limited to 24 hour ISCO sampling, damming, etc.

Standard Operating Procedure for:	
A.3 IDDE: Opportunistic Inspections (Non JCDH Employees)	
Purpose of SOP:	This SOP provides city field personnel with a quick checklist of proper procedures to follow if they observe illicit discharges while conducting their regular duties.

Always:

1) Call dispatcher, supervisor, or Leeds official if you see evidence of an illicit discharge. (If not a Leeds employee). If Leeds employee notify supervisor or follow illicit discharge procedure.
2) Assess the general area of the illicit discharge to see if you can identify its' source.

Whenever Possible:

1) Use the Incident Tracking Sheet to document observations.
2) Take photographs of the illicit discharge.
3) Get Supervisor to fill out Illicit Discharge Form.
4) Use the Catch Basin Cleaning Form to document observations during cleaning.

Never:

1) Never enter private property without permission.
2) Never put yourself in danger.

Standard Operating Procedure for:	
A.4 IDDE: Citizen Call-in Inspections	
Purpose of SOP:	To collect appropriate information from a citizen reporting a potential illicit discharge to increase the chances of identifying and removing its source.

Always:

1) Use the Citizenserve complaint system and call in line at (205)699-0943. The Incident Tracking Sheet below can provide an additional document to collect the appropriate information that then should be entered into Citizenserve complaint system
2) Investigations should be worked with in 5-7 business days and the status should be reported on the complaint system.
3) All action taken should be recorded.
4) Follow Leeds procedures on complaints for any additional information
5) All municipal employees should call in the complaint to Leeds at (205)699-0943 for tracking purposes

Whenever Possible:

1) Provide additional training on tracking stormwater complaints
2) Generate GIS databases from information taken from complaints to scan for any patterns of illicit discharges

Never:

1) Never enter private property without permission.
2) Never put yourself in danger.

ILLICIT DISCHARGE HOTLINE INCIDENT TRACKING SHEET

Copied with permission from: *Illicit Discharge Detection and Elimination-A Guidance Manual for Program Development and Technical Assessments,* CWP, 2004.

Incident ID:				
Responder Information				
Call taken by:			Call date:	
Call time:			Precipitation (inches) in past 24-48 hrs:	
Reporter Information				
Incident time:			Incident date:	
Caller contact information (*optional*):				
Incident Location *(complete one or more below)*				
Latitude and longitude: Or other coordinate system				
Stream address or outfall #:				
Closest street address:				
Nearby landmark:				
Primary Location Description	**Secondary Location Description:**			
Stream corridor *(In or adjacent to stream)*	Outfall	In-stream flow	Along banks	
Upland area *(Land not adjacent to stream)*	Near storm drain	Near other water source (storm water pond, wetland, etc.):		
Narrative description of location:				
Upland Problem Indicator Description				
Dumping	Oil/solvents/chemicals	Sewage		
Wash water, suds, etc.	Other: _____			
Stream Corridor Problem Indicator Description				
Odor	None	Sewage	Rancid/Sour	Petroleum (gas)
	Sulfide (rotten eggs); natural gas	Other: Describe in "Narrative" section		
Appearance	"Normal"	Oil sheen	Cloudy	Suds
	Other: Describe in "Narrative" section			
Floatables	None:	Sewage (toilet paper, etc)	Algae	Dead fish
	Other: Describe in "Narrative" section			
Narrative description of problem indicators:				
Suspected Violator (name, personal or vehicle description, license plate #, address, etc.):				

Standard Operating Procedure for:	
A.5 IDDE: Septic System Inspections	
Purpose of SOP:	Failed septic systems can adversely impact water quality. This SOP provides a quick reference list to supervisors and field crews that are conducting an initial screening for failures in areas that are identified in the full IDDE program.

Always:

1) Refer potential septic tank issues to JCDH (205)903-1230 if a municipal employee.
2) Leeds refers all septic tank issues to Community Environmental Protection Division. They will follow internal procedures to have all issues resolved. Monitor to make sure work is being completed.
3) Inform homeowner that they have a leak and that action needs to be taken to remediate the problem such as tank pumping until problem can be resolved

Whenever Possible:

1) Screen high risk areas (older areas or areas near lakes or impaired waterbodies). JCDH keeps a record of all septic tank malfunctions and what areas are more likely for malfunctions
2) Look for indicators of failures, such as wet areas or disagreeable odors near the leach field.
3) JCDH documents all septic tank systems as they are installed and what repairs are issued.

Never:

1) Never enter private property without permission.
2) Never put yourself in danger.

Related References	
	Jefferson County Department of Health Community Environmental Protection Division Environmental Health Services 1400 Sixth Avenue South Birmingham, AL 35233 (205)930-1230

Standard Operating Procedure for:	
A.6 IDDE: Tracing Illicit Discharges	
Purpose of SOP:	To provide a quick reference list of items to keep in mind during tracing activities to efficiently and systematically identify the source of an illicit discharge.

Always:

1) Review / consider information collected when illicit discharge was initially identified
2) Survey the general area / surrounding properties to identify potential sources of the illicit discharge as a first step. If discharge is fecal or similar JCDH takes enforcement action immediately and then educates homeowner using pamphlets, flyers, or talks to communities about ways to eliminate these issues.
3) Leeds traces illicit discharges using visual inspections of upstream points as a secondary step.
4) Leeds documents tracing results for future reference.
5) Leeds uses analysis software to tell if there are illicit discharges between set sample points and then uses personnel to track these discharges

Whenever Possible:

1) Leeds can employ the use of weirs, sandbags, dams, or optical brightener monitoring traps to collect or pool intermittent discharges during dry weather for further inspection.
2) Although rarely used by Leeds, televising of the storm drain system can be used trace high priority, difficult to detect illicit discharges.
3) Leeds dye tests, with a fluorescent green dye, the individual discharge points within suspected buildings.
4) If the source cannot be found, it is added to the area GIS database for future inspection programs.
5) Samples are always taken by Leeds usually in pairs to confirm/refute illicit discharge.

Never:

1) Never enter private property without permission.
2) Never put yourself in danger.

Standard Operating Procedure for:	
A.7 IDDE: Removing Illicit Discharges (**Leeds** and Municipal Employees)	
Purpose of SOP:	Proper removal of an illicit discharge will ensure it does not recur. Using legal methods for the removal will minimize the municipality's liability. This SOP provides an overview of illicit discharge removal procedures.

Always:

1) Determine who is financially responsible; and follow associated procedures on Table 2-9.
2) Suspend access to storm drain if threats of death or serious physical harm to humans or the environment are possible.
3) If the discharge is from an exempt facility (see Table 2-9) notify the facility operator and the appropriate enforcement authority.
4) Repair/correct cause of discharge if municipality is responsible.
5) Collect a confirmatory sample after the removal. Seek technical assistance from Leeds, if needed.
6) Seek fining methods through the *Erosion and Sedimentation Control Ordinance* or through municipal codes. Each day of discharge will constitute a separate offense.
7) Work with guilty party to solve issue as much as possible.

Whenever Possible:

1) Issue a Notice of Violation for violations of the *Erosion and Sedimentation Control Ordinance* adopted by the City.

Never:

1) Never repair/correct cause of discharge on private property until all organizations have met and decided what is the best course of action (Leeds Storm Water program, Mayor, City Official, etc.)

TABLE 2-9:
NOTIFICATION AND REMOVAL PROCEDURES FOR ILLICIT DISCHARGES INTO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM

Financially Responsible Party	Source Identified	Enforcement Authority	Procedure to Follow
Private Property Owner	One-time illicit discharge (e.g., spill, dumping, etc.)	Ordinance enforcement authority (Municipal Official, JCDH)	• Contact Owner • Issue Notice of Violation • Issue fine
Private Property Owner	Intermittent or continuous illicit discharge from legal connection	Ordinance enforcement authority (Municipal Official, JCDH)	• Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal
Private Property Owner	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., infiltration or failed septic)	Plumbing Inspector, Municipal Official, JCDH	• Notify plumbing inspector
Municipal	Intermittent or continuous illicit discharge from illegal connection or indirect (e.g., failed sewer line)	Ordinance enforcement authority (JCDH, Municipal Official, Jefferson County Environmental Services)	• Issue work order • Schedule removal • Remove connection • Confirm removal
Exempt 3rd Party • Alabama Department of Transportation ALDOT (in selected urbanized areas) • Industrial Facilities with selected SIC codes	Any	USEPA	• Notify exempt third party and USEPA of illicit discharge

Standard Operating Procedure for:	
A.8 IDDE: Removing Industrial Illicit Discharges	
Purpose of SOP:	Proper removal of an industrial illicit discharge will ensure it does not recur. Using legal methods for the removal will minimize the municipality's liability. This SOP provides an overview of industrial illicit discharge removal procedures.

Always:

1) Determine who is financially responsible; and follow associated procedures on Table 2-9.
2) Suspend access to storm drain if threats of death or serious physical harm to humans or the environment are possible.
3) If the discharge is from an exempt facility (see Table 2-9) notify the facility operator and the appropriate enforcement authority.
4) Repair/correct cause of discharge if industrial discharge is from a municipal source
5) Collect a confirmatory sample after the removal.
6) Seek fining methods through the *Erosion and Sedimentation Control Ordinance* or through municipal codes. Each day of discharge will constitute a separate offense. These offenses may be subject to escalated fees according to municipal or other ordinances.
7) Work with guilty party to solve issue as much as possible. Use environmental engineer for facility when possible, these have been identified from the existing Air Toxins program at the Department of Health

Whenever Possible:

1) Issue a Notice of Violation for violations of the *Erosion and Sedimentation Control Ordinance* adopted by all Storm Water members.
2) GIS locate all NPDES discharge sites for all industrial sources within the Storm Water member area.
3) Work with ADEM to check all NPDES permit limits to make sure industrial sources are within allowed limits

Never:

1) Never repair/correct cause of discharge on private property until all organizations have met and decided what is the best course of action Storm Water program, Mayor, City Official, etc.)

APPENDIX B

POLLUTION PREVENTION AND GOOD HOUSEKEEPING SOPS

Standard Operating Procedure for:	
B.1 Catch Basin Cleaning (Municipal Public Works Employees)	
Purpose of SOP:	To protect Storm Water by maintaining the ability of catch basins to trap sediments, organic matter, and litter. This reduces clogging in the storm drain system as well as the transport of sediments and pollutants into receiving waterbodies.

Always:

1) Inspect catch basins for structural integrity and evidence of illicit discharges during cleaning. Use the Catch Basin Cleaning Form.
2) If gross contamination (sewage or oil), stop cleaning and report to supervisor for follow up. The supervisor should then report this to stormwater at (205)699-0943.
3) Stockpile and cover catch basin residuals on an impervious surface that discharges to a sanitary sewer or buffered area until test results are known (if reuse is planned).
4) Test catch basin stockpile as follows:
   - If obviously (by visual and/or olfactory examination) contaminated with sanitary wastewater, animal wastes, oil, gasoline or other petroleum products, test the solids pursuant to the hazardous waste determination dispose of as follows:
     a) If non-hazardous – dispose at any permitted, lined solid waste landfill or other solid waste treatment facility permitted to accept this material.
     b) If hazardous – dispose of in accordance with Alabama Hazardous Waste Rules.
   - If not obviously contaminated,
     a) Test for metals, VOCs and PAHs.
     b) Compare with the following charts used by New Hampshire or relevant Alabama used charts.

Whenever Possible:

1) Inspect each catch basin at least annually, during catch basin cleaning. These forms will need to be reported to stormwater for record keeping unless the municipality has a record keeping process in place.
2) Create an internal checklist for catch basins to help classify which catch basins require maintenance and how often.
3) Perform street sweeping on an appropriate schedule to reduce the amount of sediment, debris and organic matter entering the catch basins, which in turn reduces the frequency with which they will need to be cleaned. The street sweeping schedules should be provided to Storm Water and tracked on a monthly basis by each municipality
4) Discharge fluids collected during catch basin cleaning to a sanitary WWTP, or buffered detention area.
5) The forms listed below should be completed and turned into stormwater on a monthly basis. This allows for miles of street swept and number of catch basins cleaned each year.

CITY OF LEEDS CATCH BASIN CLEANING FORM

Date:	**Precipitation in the last three days? No Yes**
Supervisor/Crew Leader:	
Municipality:	

Catch Basin ID	Basin Location	Problem Identified? (Check all that apply)				Comments
		Flow	Poor Condition	Oil Sheen	Excess Sediment	

Catch Basin Cleanings Reuse Guidance			
Maximum Contaminant Concentrations			
Regulated Contaminant	*S-1 Standards (mg/kg)*	*S-3 Standards (mg/kg)*	*USEPA SW-846 Test Method*
Metals			
Arsenic	11	11	6010B
Barium	750	3,400	6010B
Cadmium	32	230	6010B
Chromium	1000	5,000	6010B
Lead	400	400	6010B
Mercury	13	13	7471A
Selenium	260	260	6010B
Silver	45	200	6010B
VOCs			
Benzene	0.3	0.3	8260B
Dichloroethane, 1,2-	0.08	0.08	8260B
Isopropyl benzene	123	123	8260B
Methyl-t-butyl ether	0.13	0.13	8260B
Toluene	100	100	8260B
Xylene	500	1,100	8260B
Aklylbenzenes Butylbenzene, n- Butylbenzene, sec- Butylbenzene, tert- Isopropyl toluene, 4- Propylbenzene, n- Trimethylbenzene, 1,2,4- Trimethylbenzene, 1,3,5-	59 (total)	59 (total)	8260B
PAHs - Carcinogenic			
Benzo(a)anthracene	0.7	40	8270C
Benzo(a)pyrene	0.7	4	8270C
Benzo(b)fluoranthene	7	400	8270C
Benzo(k)fluoranthene	7	400	8270C
Chrysene	70	4,000	8270C
Dibenzo(a,h)anthracene	0.7	4	8270C
Indeno(1,2,3-cd)pyrene	0.7	40	8270C
PAHs – Noncarcinogenic			
Acenaphthene	270	270	8270C
Acenaphthylene	300	300	8270C
Anthracene	1,000	1,700	8270C
Fluoranthene	810	5,000	8270C
Fluorene	510	510	8270C
Methylnaphthalene,2-	150	150	8270C
Napthalene	5	5	8270C
Benzo(g,h,i)perylene Phenanthrene Pyrene	480 (Total)	5,000 (Total)	8270C

Standard Operating Procedure for:	
B.2 Storm Drain System Repair and Maintenance (Municipal Public Works Employees)	
Purpose of SOP:	To protect Storm Water by replacing or repairing components of the storm drain system on a regular basis to prevent a failure of the storm drain system.

Always:

1) Practice preventive maintenance for cracks, leaks, and other conditions that could cause breakdowns in the system by identifying maintenance issues such as:
   - For catch basins during catch basin cleaning (see SOP B.1)
   - For outfalls during IDDE inspection (see SOP A.1, A.2 and A.3)
2) Repair defective structures or equipment identified during an inspection as soon as possible.
3) Test and dispose of stockpiled materials as described in SOP B.1.
4) Document inspections, cleanings and repairs and report them to Storm Water. (SOP B.1 for catch basins, SOPs A.1 through A.3 for outfalls, and attached example form for pipes).
5) Use appropriate erosion and sediment control practices when performing repairs.

Whenever Possible:

1) Practice preventive maintenance for pipes by televising:
   - Prior to reconstruction of roadways, or
   - On a regular schedule beginning with high priority areas.
   - Or track all televising of sewer lines by Jefferson County Environmental Services.
2) Research and implement new technology that will improve the overall performance of the storm drain system.
3) Perform street sweeping on a regular basis to reduce the amount of sediment, debris and organic matter entering the storm drain system, which in turn reduces the frequency with which the system will need to be cleaned. This activity will need to be tracked and presented to Storm Water or JCDH on a monthly basis.
4) Use documentation of repairs and maintenance to develop a capital improvement and O&M plan for future system maintenance. This should be written in an overall city document plan.

Never:

1) Never allow defective equipment or structures to go unrepaired.

Related References
-USEPA National Menu of BMPS -Alabama Soil and Conservation Committee's *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management of Construction Sites and Urban Areas*

B.3 Erosion and Sediment Control (All Organizations)	
Purpose of SOP:	To protect Storm Water from pollution by reducing or eliminating pollutant loading from land disturbing activities.

Always:

1) Use erosion control techniques or devices to stabilize disturbed areas.
2) Use effective site planning to avoid sensitive areas.
3) Keep land disturbance to a minimum.
4) Inspect and maintain erosion control devices after each 0.75 inches of rain
5) Install erosion control devices properly.
6) Remove sediment accumulated during construction from permanent BMPs once construction is completed.
7) Minimize the amount of bare soil by scheduling phases of construction and stabilization.
8) Minimize slope lengths.
9) Monitor practices and adjust, maintain, and repair them periodically and after every storm.
10) Reduce the velocity of stormwater runoff.
11) Prevent erosion by covering bare soil with mulch or other cover.
12) Protect existing stormwater structures from sediment by using temporary sediment traps, silt fence, or perforated risers.
13) Divert clean water around construction site.
14) Make sure all permitting has been done and approved through by the municipality. See form on next page for electronic permit.
15) Allow 3-14 business days for initial review time on large commercial developments.

Whenever Possible:

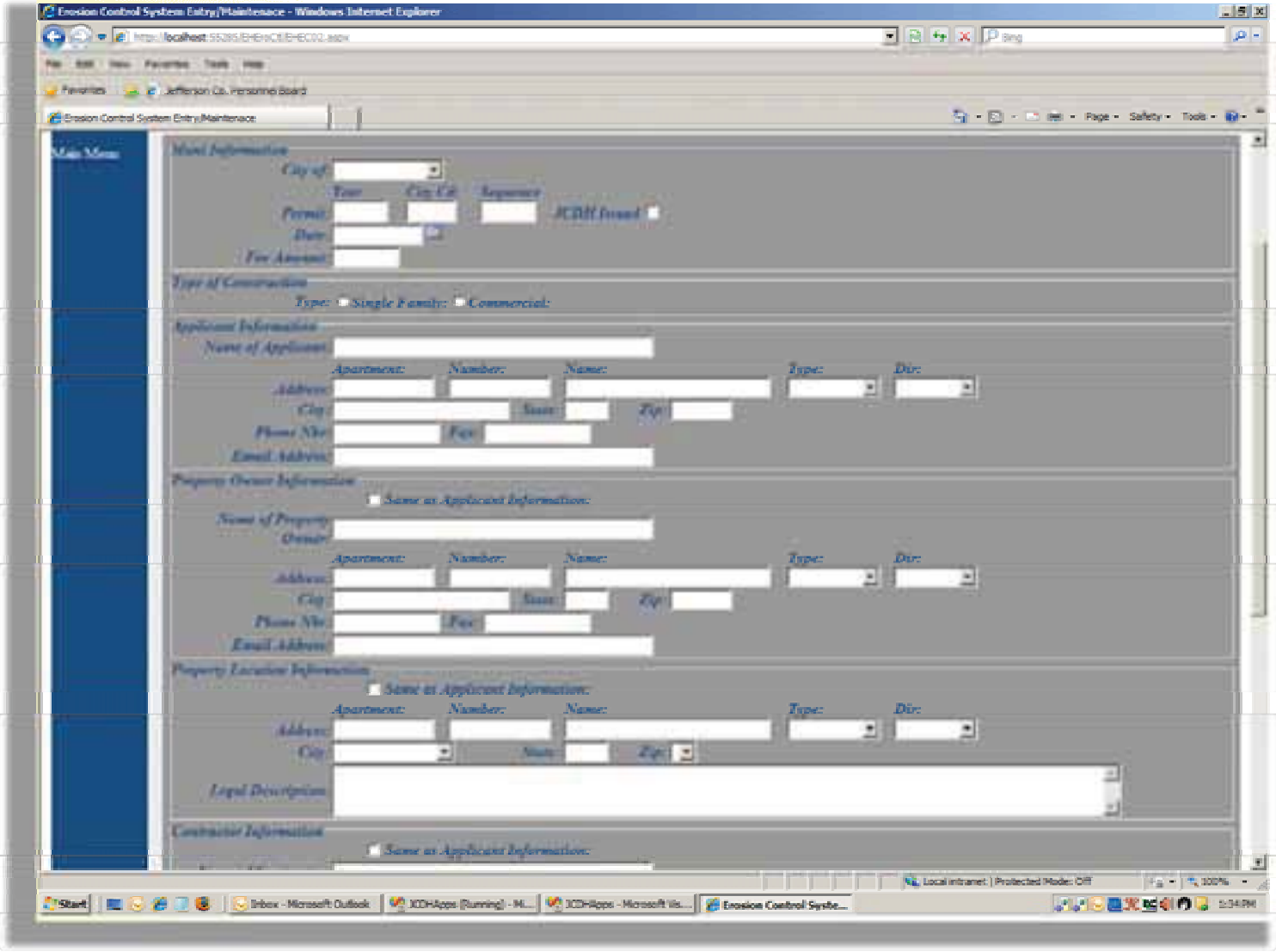
1) Limit construction activities during months with higher runoff rates.
2) Install erosion control blankets when seeding drainage ways.
3) Protect natural vegetation, especially near waterbodies, wetlands, and steep slopes.
4) Establish vegetative cover with good root systems prior to freeze/thaw cycles.

Never:

1) Never divert runoff into a sensitive area.
2) Never remove temporary measures before construction is complete.
3) Never allow silt fences to over-run or put in flow paths.

Related References
-USEPA National Menu of BMPS -Alabama Soil and Conservation Committee's *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management of Construction Sites and Urban Areas*

JCDH EROSION AND SEDIMENTATION CONTROL PERMITTING FORM



Standard Operating Procedure for:	
B.4 Landscape Design and Management (All Organizations)	
Purpose of SOP:	To protect Storm Water by designing and managing landscaping in ways that minimizes polluted runoff.

Always:

1) Design landscaping by taking into account soil types, light, drainage, desired maintenance level and budget. A soil map is attached on the following page of Jefferson County but for further soil information go to http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.
2) Design for ease of maintenance.

Whenever Possible:

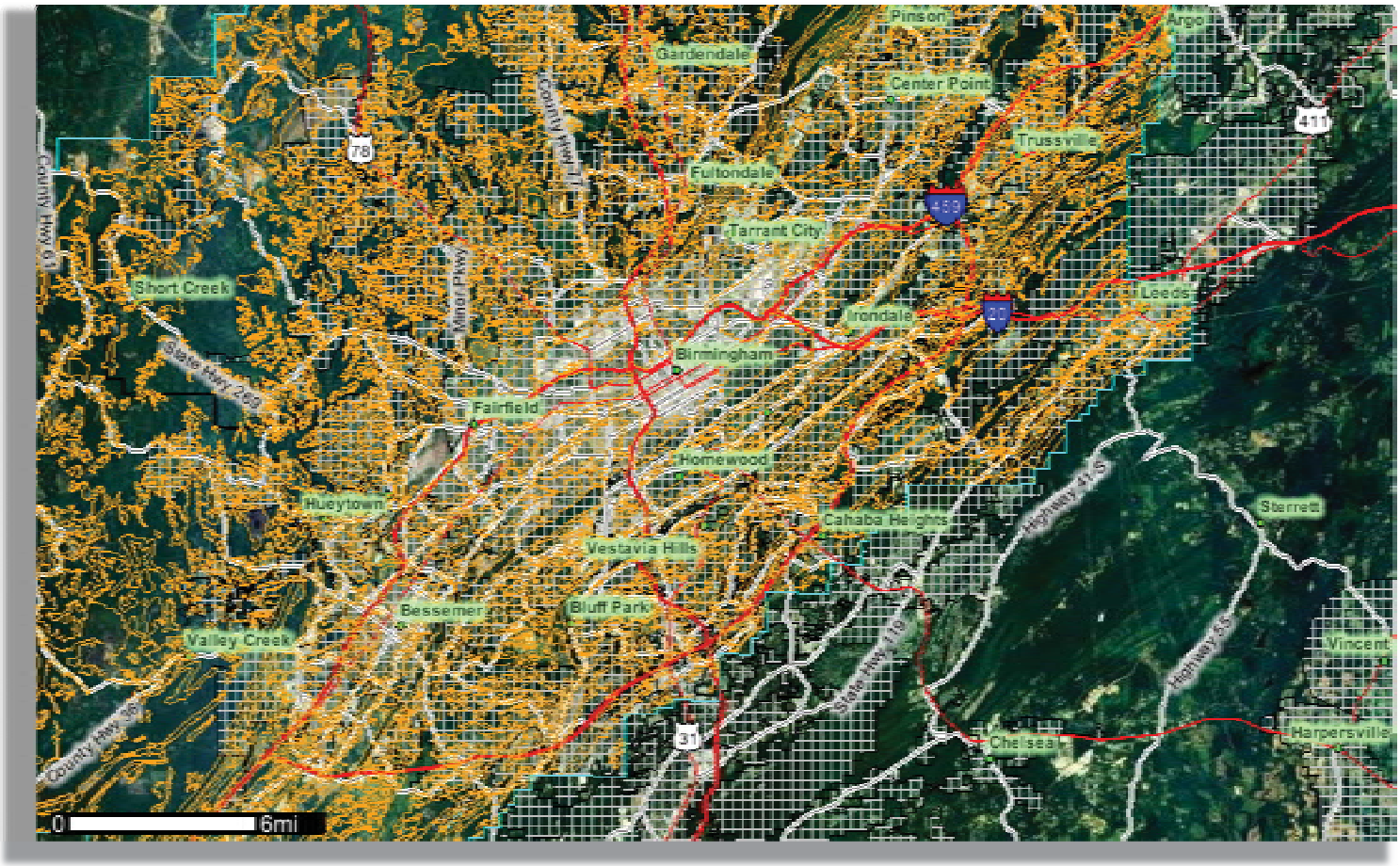
1) Minimize erosion prone steep slopes by using techniques such as terracing.
2) Use native plants that are pest resistant. Plant the right plant in the right area.
3) Manage water runoff by rerouting gutters away from storm drains and maintaining groundcovers between developed areas and waterways (ditches, swales, shorelines).
4) Reduce or eliminate mown lawn in unused areas.
5) Convert excess lawn to meadow or forest.
6) Establish set back distances from pavement, storm drains, and waterbodies. Allow these areas to serve as buffers with disease-resistant plants and minimal mowing.
7) JCDH and the Stormwater Municipalities promote Low Impact Development Design on new structures and retrofits.

Never:

1) Never develop a landscape design without assessing its impact on water quality.
2) Never cause unintended consequences such as
   - Planting large variety trees beneath overhead wires.
   - Blocking site distance at intersections
   - Planting trees with a high water demand (weeping willow) near sanitary sewer pipes and storm sewer pipes.

Related References
-United States Department of Natural Resources Conservation Services Soil Map -Alabama Department of Agriculture -USEPA National Menu of BMPs -CWP Urban Forestry Manual

JEFFERSON COUNTY SOIL MAP



SOURCE: United States Department of Natural Resources Conservation Services Soil Map website http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Standard Operating Procedure for:	
B.5 Storage and Disposal of Fertilizer and Pesticides (Municipal Employees and Homeowners)	
Purpose of SOP:	To protect Storm Water by properly storing and disposing of fertilizers and pesticides (herbicides and fungicides). Because storm drain water is not part of a wastewater treatment system, discharge of these chemicals flows untreated into ponds, lakes, rivers, streams, estuaries, and bays.

Always:

1) Store fertilizers and pesticides in high, dry locations, according to manufacturer's specifications and applicable regulations.
2) Fill out PHF storage form below.
3) Clearly label secondary containers.
4) Properly dispose of fertilizers and pesticides according to manufacturer's specifications and applicable regulations.
5) Regularly inspect fertilizer and pesticide storage areas for leaks or spills.
6) Clean up spills and leaks of pesticides and fertilizers to prevent the chemicals from reaching the storm drain system. (SOPs B.12 and B.16)

Whenever Possible:

1) Store pesticides in enclosed areas or in covered impervious containment, preferably in a locked cabinet.
2) Order fertilizers and pesticides for delivery as close to time of use as possible to reduce amount stored at facility.
3) Order only the amount needed to minimize excess or obsolete materials requiring storage and disposal.
4) Use ALL herbicides or pesticides appropriately to minimize the amount of chemicals requiring disposal.
5) Do an annual review of storage area and dispose of old, unusable or "obsolete" fertilizer or pesticides in accordance with applicable regulations (just before your local Household Hazardous Waste Day).
6) Keep an eye out for local recycling centers that will be marketed by the city.

EPA defines a pesticide as any substance intended for preventing, destroying, repelling, or mitigating any pest. Pest can include insects, animals, unwanted plants, fungi, bacteria, etc. The term applies to insecticides, herbicides, fungicides, etc.

Never:

1) Never dispose of fertilizers or pesticides in storm drains.
2) Never leave unlabeled or unstable chemicals in uncontrolled locations.

Related References	
	-USEPA National Menu of BMPs

City of Leeds

1404 9th St, Leeds, AL 35094 - www.leedsalabama.gov - 205.699.0943

Pesticide, Herbicide, and Fertilizer Storage Facility

Part 1: General Information

Stormwater Municipality: _____ Date: _____

Mayor: _____

Applicator's Department _____

Part 2: Storage Information

Storage Location Address: _____ City: _____

State: _____ Zip: _____

Amount Stored _____ gallons

Brand, Purpose, and Amounts of Chemicals Stored:

Are Storage SOPs followed: Yes No (if no why not)

Department: _____
Date: _____

*If more than 19 chemical stored then start at 1 on another form and continue forward until completed

Pesticides, Herbicides and Fertilizer Inventory

Description	Purpose	Amount (gallons)	Category	Amount Used
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				
19)				

Standard Operating Procedure for:	
B.6 Fertilizing and Turf Health Application (Municipal Employees and Homeowners)	
Purpose of SOP:	To protect stormwater by properly storing, applying, and disposing of fertilizers and by maintaining turf health to reduce diseases.

Always:

1) Store, use, and dispose of all fertilizers and contaminated wastes according to manufacturer's specifications and applicable regulations.
2) Choose seed based on soil types, intended use of area, latest variety research, and/or assessment of past site performance.
3) Check 5-day weather forecast to avoid fertilizing before heavy rain or during a drought.
4) Fill out appropriate form below.

Whenever Possible:

1) Apply fertilizers based on a soil testing program, soil type, turf function, and assessment by qualified personnel (conservation commission or municipal arborist, etc.). See Jefferson County Soil Map above.
2) Avoid fertilizing during a drought or when the soil is dry.
3) Apply fertilizers during periods of maximum plant uptake (usually fall and spring).
4) Avoid combined products such as weed and feed, which do not necessarily target specific problems at the appropriate time.
5) Calibrate application equipment to ensure proper application.
6) If phosphorus fertilizer is used when re-seeding, mix phosphorus into root- zone.
7) Use alternative or environmentally friendly products (See SOP B.15.).
8) Use natural compost and organic fertilizers instead of synthetic fertilizers.
9) Aerate grassed areas to improve drainage and bring more oxygen to the soil.

Never:

1) Never fertilize before a forecasted heavy rainfall.
2) Never apply phosphorus fertilizer on bare soil.
3) Never deposit fertilizer in the water, into storm drains, or onto impervious surfaces (streets and sidewalks).
4) Never apply fertilizer to frozen ground.
5) Never clean up spilled fertilizer by rinsing it with water.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.7 Weed and Pest Control Application (Municipal Employees and Homeowners)	
Purpose of SOP:	To protect stormwater by properly applying pesticides (herbicides and insecticides).

Always:

1) Ensure that pesticides are only applied by personnel certified by AL Department of Agriculture to do so.
2) Apply pesticides according to manufacturer's specifications, the Alabama Department of Agriculture & Industrial Food & Safety Division, Pesticide Management Section, and any local requirements.
3) Clean up any spilled chemicals (See SOPs B.12 and B.16.).
4) Use pesticides only when necessary.
5) Rinse equipment only when necessary and use rinse water to dilute next mix as long as application rates are not exceeded.

Whenever Possible:

1) Use alternative methods to control weeds and pests such as Integrated Pest Management strategies, biorational insecticides (natural soaps and oils) or biological controls. (See SOP B.15.)
2) Mix/load pesticides in an area where spills can be contained.
3) Pull weeds by hand or mechanically.
4) Spot treat affected areas only instead of entire location.
5) Apply pest control at the life stage when the pest is most vulnerable.
6) Choose the least toxic pesticides that still achieve results.
7) Tolerate low levels of weeds.
8) Allow grass to grow 2.5 to 3 inches high, reduce thatch build up and aerate soils.
9) Reduce seed release of weeds by timing cutting at seed set.

Never:

1) Never mix or prepare pesticides near storm drains.
2) Never apply controlled pesticides unless certified to do so.
3) Never apply pesticides before a heavy rainfall.
4) Never discharge rinse water or excess chemicals to storm drain, sewer, or ground surface.

Related References	
	-USEPA National Menu of BMPs

Jefferson County Department of Health and Storm Water Management Authority

1400 SIXTH AVENUE SOUTH. P.O. BOX 2648. BIRMINGHAM, ALABAMA 35202. (205)930-1230

Pesticide, Herbicide, and Fertilizer Application (Municipal Use)

FORM

Part 1: General Information

Stormwater Municipality: _____ Date: _____

Mayor: _____

Applicator's Department _____

Relevant Licenses Secured Yes No License #: _____

Part 2: Precipitation Amount

Time Since last rain (must be at least 24 hours) _____ hrs

Precipitation Chance in 3-day period (estimated 3-day forecast information) _____ % day 1

_____ % day 2

_____ % day 3

Part 3: PHF Information

Estimated Amount Applied Total: _____ gallons

Employee Hours Used in Application _____ hrs

Types Commonly Applied:

* Manufacture, Reciepts of Purchuse, and Purpose should be stated or stapled to document

Were SOPs followed during application: Yes No (if no why state below)

Application Areas:

If PHFs are applied by an outside entity (Jefferson County, State of Alabama, etc..) then contract with outside entity should be stabled to this form when returned.

Jefferson County Department of Health and Storm Water Management Authority

1400 SIXTH AVENUE SOUTH. P.O. BOX 2648. BIRMINGHAM, ALABAMA 35202. (205)930-1230

Pesticide, Herbicide, and Fertilizer Application (Private Applicator)

Application

Part 1: General Information

Stormwater Municipality: _____ Date: _____

Mayor: _____

Applicant's Name _____

Applicant's email address/ Phone number: _____

Applicator Company Name: _____

Mailing Address: _____ City _____

State: _____ Zip: _____

Relevant Licenses Secured Yes No License #: _____

Part 2: Precipitation Amount

Time Since last rain (must be at least 24 hours) _____ hrs

3-day forecast information) _____ % day 1

_____ % day 2

_____ % day 3

Part 3: PHF Information

Estimated Amount Applied Total: _____ gallons

Employee Hours Used in Application: _____ hrs

Type Applied:

Were SOPs followed during application: Yes No (if no why state below)

Application Area:

Standard Operating Procedure for:	
B.8 Mowing and Irrigation (Municipal Employees, and Homeowners)	
Purpose of SOP:	To protect stormwater by using proper mowing and watering techniques. Proper mowing and irrigation techniques will reduce organic matter and other pollutants from entering the storm drain system and waterbodies.

Always:

1) Mow only as low as needed for the area's intended use.
2) Vary mowing pattern to minimize ruts and promote even growth.
3) Base irrigation amounts on monitoring for moisture content.
4) Water at appropriate times (when no rain is forecasted and in cooler times of day).
5) Manage leaves, clippings, and compost so that runoff does not enter storm drain system or waterbodies.

Whenever Possible:

1) Allow areas to go to meadow or field and mow once or twice per year rather than every week.
2) Keep mower blades sharpened to avoid damaging grass leaf tissue.
3) Mow when the grass is dry to prevent spread of turf diseases.
4) Sweep lawn clippings and debris instead of using water.
5) Mulch grass clippings using a mulching mower.
6) Fill gas tanks in a controlled location.

Never:

1) Never irrigate based on timers/schedules instead of monitoring for moisture content.
2) Never dump gas, wastes or contaminated water down storm drains.
3) Never refuel or change the mower oil near storm drains.
4) Never leave mower running in one location (to prevent burning and over- cutting of vegetation).

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.9 Vehicle and Equipment Storage (Municipal Employees)	
Purpose of SOP:	To protect stormwater from petroleum products that may drip or leak from vehicles and equipment being stored or from dirt and sediment that accumulate in the storage areas.

Always:

1) Inspect parking areas for stains/leaks on a regular basis.
2) Use drip pans or adsorbents for leaking vehicles (provide a labeled location to empty and store drip pans).
3) Address any known leaks or drips as soon as possible.
4) Clean up spills.

Whenever Possible:

1) Store vehicles inside where floor drains have been properly connected and registered.
2) Store vehicles on paved areas, and street sweep on a regular basis to remove drips/leaks/dirt, and dispose of street sweepings properly.
3) Maintain vehicles to prevent leaks.

Never:

1) Never store leaking vehicles over a storm drain.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.10 Vehicle and Equipment Washing	
Purpose of SOP:	To protect stormwater using proper washing techniques, proper washing locations, and proper disposal of wash water for heavy and light-duty vehicles and equipment.

Always:

1) Operate a closed system with wastewater recycling (like a floor drain discharge to a holding tank), or
2) Discharge to a municipal sanitary sewer, or
3) Obtain a Septic Tank permit from the local health department, or
4) Wash fewer than 30 vehicles per week and discharge to the ground surface, if
   - Good Best Management Practices Rules are used,
   - The discharge is registered through NPDES permitting, and
   - The washwater:
     a) is not from power washing, steam cleaning, engine cleaning, or undercarriage cleaning,
     b) does not contain soaps or other products which contain regulated contaminants, and
     c) does not discharge to a surface water.

Whenever Possible:

1) Use a commercial car wash for light duty vehicles.
2) Obtain and use drain guards (filter inserts) to catch sediments, petroleum products, etc. that might enter the storm drains as a result of vehicle washing.
3) Minimize water and soap use when washing or rinsing vehicles.

Never:

1) Never perform engine or undercarriage washing outside.
2) Never wash vehicles over a storm drain or near drinking water wells.
3) Discharge washwater to a surface water.

Related References	
	-Alabama Department of Environmental Management

Standard Operating Procedure for:	
B.11 Vehicle and Equipment Fueling (Municipal JCDH Employees)	
Purpose of SOP:	To prevent stormwater contamination originating from vehicle and equipment fueling.

Always:

1) Fuel carefully to minimize drips to the ground surface.
2) Maintain clean fuel dispensing areas using dry cleanup methods.
3) Clearly label and tag all valves to reduce human error.
4) Train employees and subcontractors on proper fueling methods and spill cleanup techniques.
5) Maintain fuel storage tanks in accordance with local, state and federal laws.
6) Have absorbent spill cleanup kits and materials available at fueling areas.
7) Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.
8) When fueling small equipment from portable containers, fuel in a designated area away from storm drains and waterbodies.

Whenever Possible:

1) Install a canopy or roof over aboveground storage tanks and fuel transfer areas.
2) Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
3) Use designated fueling areas built upon a level impervious surface (hard cement is best). If paved with asphalt, add a protective coating to create an impervious surface, inspect regularly, and street sweep quarterly at a minimum.
4) Protect storm drains from fueling areas using berms and dikes.
5) Use absorbent material or absorbent pads during fueling to collect leaks.

Never:

1) “Top off” fuel tanks (post signs to remind employees).
2) Hose down or bury a fuel spill.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.12 Spill Cleanup	
Purpose of SOP:	To protect stormwater by educating employees on proper spill cleanup procedures, state reporting requirements and preventative actions.

Always:

1) Stop the source of the spill, if possible to safely do so.
2) Contain any liquids, if possible to safely do so.
3) Contact the appropriate emergency response number (see below) during normal working hours (8:00 a.m. – 4:00 p.m., Monday - Friday) to report spills.
   - Jefferson County Emergency Management Agency– Oil and Response (205)254-2039**; St. Clair Co EMA at (205) 884-6800**
   - National Response Center – Chemical or Oil Spills that Impact Surface Water **(800)** 424-8802
   - USEPA Region 4 –(800)241-1754 or (404)562-9900
4) Cover the spill with absorbent material such as kitty litter, sawdust, or oil absorbent pads. Do not use straw or water. (See SOP B.16 for adsorbent disposal.)
5) Petroleum spills involve, but are not limited to: crude oil, gasoline, heating oil, various fuel oils, lubricating oil, hydraulic oil, asphaltic residuals.
6) Report a petroleum spill if:
   - The spill is greater than 25 gallons, or
   - The spill cannot be immediately contained, or
   - The spill and/or contamination cannot be completely removed within 24 hours, or
   - There is an impact or potential impact to ground/surface water.
   - IF IN DOUBT, REPORT THE SPILL
7) Hazardous materials spills involve non-oil spills that pose a threat to human health or the environment, such as chemical releases.
8) Report any discharge of hazardous waste immediately, (within one hour) to local emergency officials [fire department], then contact the Jefferson County Emergency Management Agency as listed above
9) Contact the Leeds fire department (phone #). 911
10) Develop and maintain a Spill Prevention, Control, and Countermeasure (SPCC) Plan if the facility stores more than 1,320 gallons of petroleum.
11) Fit petroleum and chemical storage containers with secondary containment structures.
12) Keep a spill kit in areas where petroleum or hazardous materials are stored.
13) Train employees in spill response procedures and equipment annually.
14) Deploy containment booms if spill could potentially reach a storm drain or waterbody. Stormwater is working with the fire departments to develop these maps which should be done by 2021
15) Position mats to contain drips from equipment or vehicles until they can be repaired.

Whenever Possible:

1) Seal the floor with paint to prevent absorption of fluids into concrete.
2) Install low-level or low-pressure alarms and/or cut-off systems on hydraulic equipment.

Never:

1) Never wash a spill into the storm drain or a water body.
2) Never leave a spill without cleaning it up.

Standard Operating Procedure for:	
B.13 Parts Cleaning (Municipal Employees)	
Purpose of SOP:	To protect stormwater by practicing proper parts cleaning techniques and disposing of waste cleaners properly.

Always:

1) Perform all cleaning in a designated area to minimize the potential for spills.
2) Store waste cleaners in properly labeled containers in accordance with regulations.
3) Dispose of all waste cleaners properly with a licensed contractor, on a regular basis.
4) Close parts-cleaner lid when it is not in use.

Whenever Possible:

1) The variety of cleaners should be minimized to make recycling and disposal simpler.
2) Use citrus-based cleaners and dispose of properly.
3) Use steam cleaning, pressure washing, or aqueous washers instead of solvents; however wastewater must be discharged to an oil/water separator and the wastewater treatment plant notified, or to a health department registered septic tank.

Never:

1) Never dispose of spent cleaners down the floor drains, sinks, storm drain, on the ground or into the air. Disposal by evaporation violates the Alabama Hazardous Waste Rules.
2) Never mix or add spent or fresh solvents to used oil.
3) Never use gasoline as a cleaner or solvent.
4) Never burn spent parts cleaning fluids in a used oil burner.
5) Never use a hand-held cleaner in/near the parts cleaner; never mix cleaners.

Standard Operating Procedure for:	
B.14 Spare Parts Storage	
Purpose of SOP:	To protect stormwater by properly storing spare parts. Improper storage of materials can result in pollutants and toxic materials entering ground and surface water supplies.

Always:

1) Store spare parts in a designated area.
2) Use drip pans for any parts that are dripping.

Whenever Possible:

1) Store spare parts inside or under cover.
2) Monitor storage areas for staining/leaks on a schedule decided on by the appropriate personnel.
3) Clean the majority of petroleum products from the parts that are to be stored.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.15 Alternative Products Use/Storage/Disposal (All Organizations)	
Purpose of SOP:	To protect stormwater by using alternative products that are more environmentally friendly.

Always:

1) Ask product suppliers, peers, or regulatory agents if there is a more environmentally friendly alternative, when ordering any product.

Whenever Possible:

2) Use alternative products when deemed appropriate:
   - Instead of solvent-based parts cleaners use citrus–based cleaners or steam/pressure wash to an oil/water separator/holding tank.
   - Instead of herbicides use bark mulch.
   - Instead of fertilizer use compost or manure.
   - Instead of pesticides plant marigolds, onion, or garlic as deterrents; release or attract beneficial insects.
   - Instead of synthetic adsorbents, use corncob or cellulose products for petroleum spills that can be burned for energy recovery.
3) Train employees annually on the benefits of using alternative products.
4) Minimize waste by purchasing recyclable products that have minimal packaging.
5) Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.
6) Use a "pre-mix" of 4 to 1 sodium chloride and calcium chloride, which is the most cost- effective alternative to straight salt.
7) Substitute synthetic fertilizers with natural compost and organic fertilizers to improve soil pH, texture and fertility, and cause less leaching to groundwater.
   - Use no-phosphorus lawn fertilizer.
   - Use natural or certified organic fertilizers with low phosphorus levels (8-2-4, 6-2-4, 9-1-1, 6-1-1).
8) Use slow-release nitrogen fertilizers.
9) Reduce or eliminate mown lawn in areas that are not actively used.
10) Consider converting unused turf to meadow or forest.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.16 Petroleum and Chemical Disposal (Municipal Employees and Homeowners)	
Purpose of SOP:	To protect stormwater from petroleum and chemical products due to improper disposal practices.

Always:

1) Maintain tracking and manifest to report to Leeds, where necessary, of chemicals and petroleum products being disposed or recycled off-site.
2) Transports used petroleum and chemical products with a licensed transporter and maintain records for three years.
3) Train employees annually on proper disposal practices.
4) Drain used oil filters for 24-hours before crushing and disposal (disposal in regular trash allowed).
5) Analyze floor drain solids (from sediment trap) for TCLP to determine if hazardous waste or not.
6) Contaminated cloth wipe may be laundered onsite or offsite, liquid free, and stored in a closed, labeled container.

Whenever Possible:

1) Minimize the number of solvents used to reduce the variety of waste generated and to make recycling easier.
2) Use safer alternatives. (see Alternative Products SOP)
3) If burning used oil for on-site heat, analyze for these used oil standards (Arsenic, Lead, Cadmium, Chromium, F- listed Halogens, Flashpoint, PCBs) approximately once every 1,000 gallons.

Never:

1) Never place hazardous waste in solid waste dumpsters.
2) Never pour liquid waste down floor drains, sinks or outdoor storm drain inlets.
3) Never mix petroleum waste and chemical waste.
4) Never dispose of any gasoline-contaminated waste in the regular trash. Dispose of it only as a hazardous waste.

Standard Operating Procedure for:	
B.17 Petroleum and Chemical Handling (Municipal Employees)	
Purpose of SOP:	To protect stormwater by properly managing petroleum products and chemicals used by municipalities.

Always:

1) Train employees in hazardous material handling, safety, spill cleanup and reporting on an annual basis.
2) Handle petroleum products and chemicals according to manufacturer's specifications.
3) Conduct oil changes indoors for equipment that fits indoors.
4) Use proper protective equipment.
5) Maintain Material Safety Data Sheets (MSDS) for all chemicals used.
6) Make MSDS sheets available on materials that require special handling, storage and/or disposal.
7) Create a sign-off sheet for employees stating that they know the location of the MSDS(s) and provide to Leeds.
8) Train new employees within six months of hire. A record of this should be kept and given annually to Leeds

Whenever Possible:

1) Assess hazardous material needs to minimize the amount and variety of hazardous material in storage.
2) Keep an inventory of hazardous materials on hand.
3) Transfer materials from one container to another indoors in a well ventilated area.
4) Properly label containers.

Never:

1) Never treat or dispose of hazardous materials unless licensed to do so.
2) Never mix petroleum or chemicals unless directed by manufacturer's instructions.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.18 Petroleum and Chemical Storage – Bulk (Municipal Employees)	
Purpose of SOP:	To protect stormwater by properly storing bulk petroleum products and chemicals (containers larger than 55 gallons).

Always:

1) Store materials away from high traffic areas, posted with appropriate signage.
2) Store materials according to manufacturer's specifications in approved containers and conditions.
3) Be prepared for possible spills by having a spill kit nearby.
4) Register ASTs if your facility stores more than 660 gallons of petroleum products (10,000 gallons if used for on-site heating).
5) Develop and use a Spill Prevention Control and Countermeasure (SPCC) plan if storing more than 1,320 gallons of petroleum (required).
6) Store incompatible hazardous materials in separate areas.
7) Inspect storage areas for leaks or drips frequently.
8) Store bulk items within secondary containment areas if bulk items are stored outside.
9) Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products. Keep record and present to Leeds annually.

Whenever Possible:

1) Store bulk chemicals and petroleum products inside or under cover.
2) Provide secondary containment for interior storage.
3) Cover transfer areas.

Never:

1) Never store bulk chemicals or petroleum products near a storm drain.

Standard Operating Procedure for:	
B.19 Petroleum and Chemical Storage – Small Quantity (All organizations and Homeowners)	
Purpose of SOP:	To protect stormwater from pollution by properly storing petroleum products or chemicals (containers 55 gallons and smaller).

Always:

1) Store materials away from high traffic areas.
2) Store materials according to manufacturer's specifications (e.g. in a flammable materials storage cabinet).
3) Dispose of unused or waste materials properly.
4) Train employees on proper storage procedures for petroleum and chemical products.
5) Store materials in their original containers to maintain appropriate labeling.
6) Be prepared for spills by having a spill kit nearby.
7) Frequently inspect the storage areas for leaks or spills.
8) Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products. A list should be provided to Leeds at the end of the permit cycle.

Never:

1) Never store petroleum or chemical products near a floor drain or stormwater inlet.

Standard Operating Procedure for:	
B.20 Garbage Storage (All Organizations and Homeowners)	
Purpose of SOP:	To protect stormwater from contamination by properly storing garbage. Garbage and leachate can be transported by Storm Water and enter the storm drain system and receiving waterbodies.

Always:

1) Cover rubbish bins to keep rubbish and leachate in and wind and rain out.

Whenever Possible:

1) Store garbage containers beneath a covered structure or inside to prevent contact with stormwater. This is done on all food establishments as well by JCDH.
2) Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
3) Locate dumpsters on a flat, concrete surface that does not slope or drain directly into the storm drain system.
4) Locate dumpsters and trash cans in convenient, easily observable areas.
5) Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
6) Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
7) Keep bins free of improperly discarded trash.
8) Provide training to employees to prevent improper disposal of general trash.
9) Minimize waste by purchasing recyclable products that have minimal packaging.
10) Request/use dumpsters without drain holes.

Never:

1) Never place hazardous wastes in a dumpster or trash bin.
2) Never place gasoline-contaminated wastes in a rubbish bin (but small quantities of adsorbents from virgin oil spills are acceptable).
3) Never place oil-contaminated materials that release free draining oil into a rubbish bin.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.21 General Facility Housekeeping (All Organizations)	
Purpose of SOP:	To protect stormwater by maintaining a clean, organized facility.

Always:

1) Keep open areas clean and orderly.
2) Pick up litter.
3) Conduct regular employee training and public education to reinforce proper housekeeping. Keep internal records to provide to development.
4) Remove unused scrap/junk materials.
5) Store hazardous materials as specified by the manufacturer.

Whenever Possible:

1) Store materials and wastes inside or under cover if outside.
2) Substitute less or non-toxic materials for toxic ones.
3) Perform a routine cleaning of the facility.
4) Inspect facility (interiors, exterior, parking areas, etc.) for stains.

Related References	
	-USEPA National Menu of BMPs

Standard Operating Procedure for:	
B.22 Floor Drains (Municipal Employees)	
Purpose of SOP:	To protect stormwater from pollution caused by discharges of hazardous materials to the subsurface, ground surface, waterway, or storm sewer through floor drains.

Always:

1) Keep a spill kit in the vicinity of the floor drains.
2) Obtain and use drain mats, adsorbent booms or covers to keep larger spills out of drains.
3) Use floor drains that are (1) connected to a holding tank or (2) connected to the sanitary sewer via an oil/water separator.
4) Keep internal map of floor drains that have regulated contaminants stored or used near them.
5) Register septic tanks with the local health department.

Whenever Possible:

1) Minimize water use or run a dry shop.

Never:

1) Never dump hazardous materials down the floor drains.
2) Never use floor drains if you are unsure of their discharge location.
3) Never store regulated contaminants near a floor drain that discharges directly to the environment.

Standard Operating Procedure for:	
B.23 Painting (All Organizations and Homeowners)	
Purpose of SOP:	To protect stormwater by properly storing, using and disposing of paint and preparation materials.

Always:

1) Store waste paints, solvent, and rags in sealed containers.
2) Perform abrasive blasting and spray painting in accordance with regulations.
3) Properly clean, store, and dispose of paint and associated waste materials.
4) Train employees on Best management Practices concerning painting activities, cleanup, and disposal.

Whenever Possible:

1) Replace solvent-based paint with less toxic paints such as latex or water-based paints.
2) Practice “source reduction” – buy only the paint that is needed.
3) Use up, donate or recycle unused paint.
4) Use drop cloths under any painting or preparation activity such as scraping or sandblasting.
5) Use techniques such as brushing and rolling to avoid overspray.
6) Use vacuum sanders to collect paint dust.
7) Perform abrasive blasting and spray painting in an enclosed or covered area that is safe for personnel.

Never:

1) Never dispose of paint or waste paint products into the storm drain system, a waterbody, or onto the ground.

Standard Operating Procedure for:	
B.24 Street Sweeping	
Purpose of SOP:	To remove sediment, debris and other pollutants from streets, parking areas, and paved surfaces through regular, properly timed sweeping schedules.

Always:

1) Sweep all publicly accepted paved streets and parking lots at least once per year as soon as possible after snowmelt.
2) Dispose of street sweepings properly (reuse is unrestricted if visual evidence of litter, animal waste, and petroleum contamination is absent).
3) Keep data logs on the mileage of street sweeping conducted in each city to provide to Storm Water or JCDH such as the form below.

Whenever Possible:

1) Start at the "top" of town and work down.
2) Sweep downtown areas more frequently (daily).
3) Perform additional sweeping on a seasonal schedule and document areas swept.
4) Sweep in locations that generate debris, such as construction entrances, sand/salt loading areas, vehicle fueling areas, and vehicle and equipment storage areas on an as needed basis.
5) Street sweep before a major rain event.
6) Use dry vacuum assisted street sweepers (the most effective).
7) Maintain street sweeping equipment for maximum effectiveness.
8) Cover storage areas or locate storage areas where runoff discharges to a buffer.
9) Clean catch basins after streets are swept.

Never:

1) Never store street sweepings in areas where stormwater could transport fines to the storm drain system or a waterbody.
2) Never purposely sweep into the storm drain system.

Standard Operating Procedure for:	
B.25 Snow Disposal (Municipal Employees)	
Purpose of SOP:	To protect stormwater by minimizing the impact of snow piles which contain sand, salt, and trash and which generate concentrated releases of pollutants during spring snowmelt conditions.

Always:

1) Identify sensitive ecosystems prior to disposal and avoid snow disposal in these areas.
2) Store snow at least 25 feet from the high water mark of a surface water.
3) Store snow at least 75 feet from any private water supply, at least 200 feet from any community water supply, and at least 400 feet from any municipal wells.
4) Install a double row of silt fence or equivalent barrier securely between the snow storage area and the high water mark, and inspect periodically throughout the winter season.
5) Clear debris in storage area each year prior to snow storage use.
6) Clear all debris in snow storage area and properly dispose of no later than April 15 or immediately after snowmelt occurs of each year the storage area is in use.

Whenever Possible:

1) Select storage locations that do not drain into surface waters and where environmental impacts of spring melt are minimal.
2) Store snow on areas that are well above the groundwater table on a flat, vegetated slope.
3) Avoid disposal on pavement, concrete, and other impervious surfaces.
4) Do not pile snow in wooded areas, around trees or in vegetative buffers.
5) Divert run-on of water from areas outside the snow piles.
6) Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.

Never:

1) Never dispose of snow in wetlands, lakes, streams, rivers, or near drinking water sources.
2) Never store snow in well-head protection areas (class GAA groundwater).

Standard Operating Procedure for:	
B.26 Deicing Material Storage (Municipal Employees)	
Purpose of SOP:	To protect stormwater by properly storing deicing materials. Sand, salt and other deicing materials used during winter can be transported by runoff into the storm drain system and eventually into waterbodies if not stored properly.

Always:

1) Locate sand/salt piles and deicing fluid tanks on flat, impervious sites that are easily protected from overland runoff and away from surface waters.
2) Cover sand/salt and salt piles with a tarp (polyethylene) during non-freezing spring and summer months when indoor storage facilities are not available.
3) Fill out form below on amounts and facility location

Whenever Possible:

1) Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
2) Allow rinse water/melt water to drain into vegetated buffers (away from storm drains).
3) Locate deicing material stockpiles and tanks at least 100 feet from streams and flood plains.
4) Contain stormwater runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
5) Use diversion berms to minimize run-on to storage areas.
6) Cleanup “truck tracks” after storm events.

Never:

1) Never dispose of wash water from sanding and salting trucks into the storm drain system, a waterbody, or septic system drain fields.

Stormwater Municipality: _____

Mayor: _____

Sand or Deicing Storage Location (Municipal use)

Storage Location Address: _____ City: _____ State: _____

Amount Stored _____ yd^3

Are SOPs followed Yes No (if no please explain below)

Stormwater Municipality: _____

Mayor: _____

*If more than 197 roadway projects then start at 1 on another form and continue forward until completed

Roadway Projects Inventory

Location	Project Description	Was planned reviewed by JCDH, STORM WATER, or member	Permit Number
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

* Please staple all permits, inspections, and plan review dates to form for annual report

Standard Operating Procedure for:	
B.27 Deicing Material Application	
Purpose of SOP:	To protect stormwater by improving application techniques of salt, sand, and other deicing materials.

Always:

1) Apply as little sand and salt as needed, and no more than the NHDOT recommended application rates (based on level of service):

Condition	Highways carrying greater than 5,000	Highway/roads carrying less than 5,000 vehicles daily
Snow - 20°F and	250 lbs salt	250 lbs salt per lane mile
Snow – below 20° F	250 lbs salt	Abrasive chemical mix
Sleet/freezing rain	300 lbs salt	300 lbs salt per lane mile

Whenever Possible:

1) Inform salt applicators of sensitive areas, such as public water supplies, lakes, ponds, etc b installing permanent signs.
2) Use de-icing alternatives such as calcium magnesium acetate, sand, etc. in sensitive areas.
3) Use the minimum amount of salt and sand needed to get the job done.
4) Use coarse, clean “washed” sand, which is free of fine particles and dust and easier to clean in the spring.
5) Equip all spreaders with ground-speed controllers.
6) Train drivers to improve application techniques and reduce losses.
7) Consider applying salt in a 4-8 foot strip along centerline of a two-lane road (for less traveled roads).
8) Know when to plow and reapply salt. Allow maximum melting by salt before plowing.
9) Remove snow manually from driveways and sidewalks.
10) Street sweep accumulated salt and sand at the end of the season.

Jefferson County Department of Health and Storm Water Management Authority

1400 SIXTH AVENUE SOUTH. P.O. BOX 2648. BIRMINGHAM, ALABAMA 35202. (205)930-1230

Roadway Form (Municipal Use)

FORM

Part 1: General Information

Stormwater Municipality: _____ Date: _____

Mayor: _____

Contact Person: _____

Part 2: Trash Collection

Estimated Trash Collected in Permit Year: _____ lbs

Estimated Employee Hours collecting trash: hrs

Disposal Method for Trash: _____

(*What landfill was used for disposal, dump tickets should be included if present)

Part 3: Street Sweeping

Street Sweeping for Permit Year: _____ miles

Street Refuse Reused: _____ lbs

Street Refuse Disposal: _____ lbs

Employee hours spent disposing of refuse: hrs

Disposal Method: _____

(*What landfill was used for disposal, dump tickets should be included if present)

Part 4: Sand or Deicing Material

Sand or Salt used for Permit Year: _____ yd^3

Sand or Salt disposal for Permit Year _____ yd^3

Estimated Employee Hours disposing of material: _____ hrs

Disposal Method for Sand or Salt: (*What landfill was used for disposal, dump tickets should be included if present)
**Sand Storage Form should be filled out with location of sand storage
If roadway functions are performed by an outside entity (Jefferson County, State of Alabama, etc..) then contract with outside entity should be stabled to this form when returned.