STANDARD OPERATING PROCEDURES (SOPs)

for

Stormwater Management

City of Kingsport, Tennessee

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	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Waste Management
City of Kingsport, TN	Stormwater Management	All Departments

Description

All solid and liquid wastes must be disposed of properly. Some of the most common sources of pollution at municipal facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

General

- Provide cover, if feasible, for all waste storage areas including keeping dumpster lids closed.
- Provide a low containment berm, if feasible, around waste storage areas.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.
- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- Follow the Spill Prevention and Response procedure to respond to and clean up any spills or leaks.
- Clean storage areas when necessary using dry cleanup methods (except in areas where the wash water will enter the sanitary sewer and is an approved discharge).
- Return dumpsters to the supplier when cleaning is necessary or if the dumpster is leaking.
- Properly handle and dispose of all hazardous wastes. See the Outdoor Material Storage procedure for more information.

Possible Pollutants

Construction Debris
Organics
Oil and Grease
Trash
Metals
Paint
Toxins

Good Housekeeping

Dumpster/waste management
Employee/Contractor Training
Proper cleanup and disposal procedures
Dry cleaning methods
Stormwater retrofits

Related Procedures

Large Outdoor Festivals and Events
Outdoor Material Storage
Spill Prevention and Response
Street Sweeper Cleaning and Waste

Standard Operating Procedure

Solid Waste

- Solid waste that cannot be recycled should be disposed of in the trash dumpster.
- Recycle solid wastes when possible, including the following:
  - Glass
  - Plastic containers
  - Cardboard and Paper
  - Organic material
  - Scrap metal
  - Wood debris
  - Used batteries
  - Used oil filters
  - Light bulbs
- Follow the Street Sweeper Cleaning and Waste procedure for proper disposal of street sweepings.

Liquid Waste

- Never place liquids in a dumpster.
- If unable to recycle, old latex paints should be mixed with floor dry or other adsorbent material to solidify prior to disposal in the trash.
- If unable to recycle, enamels and other oil-based paints should be applied to cardboard, newspaper, or similar materials and allowed to dry prior to disposal in the trash.
- Recycle liquid wastes, including the following:
  - Used oil
  - Used antifreeze
  - Used solvents

Employee Training

- Train applicable employees who dispose of wastes on this written procedure. Information on how to avoid and report spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who dispose of wastes.

Records

The following records could be used to document activities performed:

- Records of employee training with sign-in sheet.

Optional Additional Resources

Frequency of trash and recycling pick ups.
List of Recycling Sites:
List of Companies Accepting Hazardous Waste

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Fueling
City of Kingsport, TN	Stormwater Management	All Departments

FUELING

1. Preparation

a. Train employees on proper fueling methods and spill cleanup techniques.
b. Install a canopy or roof over aboveground storage tanks and fuel transfer areas.
c. Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on mobile fueling vehicles and shall be disposed of properly after use.

2. Process

a. Shut off the engine.
b. Ensure that the fuel is the proper type of fuel for the vehicle.
c. Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut off to prevent overfill.
d. Fuel vehicle carefully to minimize drips to the ground.
e. Fuel tanks shall not be 'topped off'.
f. Mobile fueling shall be minimized. Whenever practical, vehicles and equipment shall be transported to the designated fueling area in the Facilities area.
g. When fueling small equipment from portable containers, fuel in an area away from storm drains and water bodies.

3. Clean Up

a. Immediately clean up spills using dry absorbent (e.g., kitty litter, sawdust, etc.) sweep up absorbent material and properly dispose of contaminated clean up materials.
b. Large spills shall be contained as best as possible and the HazMat team should be notified ASAP.

4. Documentation

a. Comply with underground storage tank records and monitoring requirements.
b. Document training of employees.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Material Storage
City of Kingsport, TN	Stormwater Management	All Departments

Description

The responsible management of automotive products, fertilizers, pesticides, paints, chemicals, and other materials at a city facility can significantly reduce polluted stormwater runoff. All materials should be handled properly including unloading, use, storage, and disposal.
Proper management of materials can also reduce the likelihood of accidental spills or releases. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

General

- Establish material storage and inventory controls to minimize the amount of materials used and stored.
- Periodically inspect material storage areas to ensure that all materials are being stored properly when not in use.
- Clean the material storage area when necessary using dry cleanup methods.
- Properly dispose of unused materials.
- Store materials in a manner that reduces the potential for transport in stormwater flows.

Materials Stored in Containers

- Whenever possible, containerize and cover stored materials to prevent stormwater from coming in contact with materials. Secondary containment may be required.
- Store containers in a location where they will not be accidentally damaged by equipment or vehicles.
- Provide tight-fitting lids for all containers.

Possible Pollutants

Sediment
Organics
Oil and Grease
Trash
Metals
Toxins

Good Housekeeping

Employee/Contractor Training
Proper cleanup and disposal procedures
Dry cleaning methods

Related Procedures

Salt and Sand Storage
Spill Prevention and Response
Waste Management

Standard Operating Procedure

- Follow the Spill Prevention and Response procedure to respond to and clean up any spills or leaks.
- Inspect storage containers regularly for signs of leaking or deterioration.
- Replace or repair leaking storage containers.
- Use care to avoid spills when transferring materials from one container to another.
- Use powered equipment or get assistance when moving materials to and from a storage area. Handle containers appropriately and get help if needed. Use care to prevent punctures in the containers from equipment.

Loose Materials

- Consolidate loose material (gravel, mulch, etc.) and berm where needed to prevent run-on of stormwater.
- Follow the Salt and Sand Storage procedure for piles of salt and sand.
- Large inert materials such as piping and road signs can be stored outside without a protective covering. These materials do not impact stormwater quality.
- Rusting iron is a potential source for stormwater pollution and should not come in contact with stormwater.

Hazardous Materials

- Identify all hazardous materials stored at the facility.
- Maintain a Material Safety Data Sheet (MSDS) for each hazardous chemical.
- Clearly label all containers with the name, chemical, unit number, expiration date, handling instructions, and health and environmental standards.
- Provide special handling, storage (e.g., metal lockers), and disposal for all hazardous materials.

Employee Training

- Train applicable employees on this written procedure. Information on how to respond to spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who perform outdoor material storage activities.

Records

The following records could be used to document activities performed:

- Records of employee training with sign-in sheet.
- MSDSs.
- Packing lists, purchasing records, inventory records.

Optional Additional Resources

City codes and ordinances that relate to outdoor materials storage.
Locations of hazardous materials.
Loading and unloading operations.
Spill Prevention Control and Countermeasures Plan

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Vehicle and Equipment Cleaning
City of Kingsport, TN	Stormwater Management	All Departments

VEHICLE AND EQUIPMENT WASHING

1. Preparation

a. Provide wash areas for small vehicles and equipment inside the maintenance building that has a drain system which is attached to the sanitary sewer system.
b. Provide wash areas for large vehicles on an approved outside wash pad that has a drain system which is attached to the sanitary sewer system.
c. No equipment and/or vehicle washing will be done where the drain system is connected to the storm sewer system.

2. Process

a. Minimize water and soap use when washing vehicles inside the shop building.
b. Soap should not be used when washing vehicles outside the shop building. Water only.
c. Use hoses with automatic shut off nozzles to minimize water usage.
d. When washing outside the building, it is the operators' responsibility to make sure all wash water is contained on the wash pad and does not have access to the storm drain.
e. Never wash vehicles over or a storm drain.

3. Clean Up

a. Sweep wash areas after every washing to collect what solids can be collected to prevent them from washing down the drain system.
b. Clean solids from the settling pits on an as needed basis.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Transporting Equipment
City of Kingsport, TN	Stormwater Management	All Departments

TRANSPORTING EQUIPMENT

1. Preparation

a. Determine equipment needed for transport and method (trailer, truck bed) needed to transport equipment.
b. Conduct pre- trip inspection of equipment

2. Process

a. Load and secure equipment on trailer or truck
b. Load and secure fuel containers for equipment usage

3. Clean-up

a. Off load equipment
b. Store equipment and trailer in proper locate on
c. Conduct post-trip inspection of equipment
d. Wash equipment, if needed, according to the SOP for Cleaning Equipment SOP

4. Documentation

a. Pre-trip and post trip inspection report

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Vehicle and Equipment Storage
City of Kingsport, TN	Stormwater Management	All Departments

VEHICLE AND EQUIPMENT STORAGE

1. Preparation

a. Inspect parking areas for stains/leaks on a regular basis.
b. Provide drip pans or adsorbents for leaking vehicles.

2. Process

a. Whenever possible, store vehicles inside where floor drains have been connected to sanitary sewer system.
b. When inside storage is not available, Vehicles and equipment will be parked in the approved designated areas.
c. Maintain vehicles to prevent leaks as much as possible.
d. Address any known leaks or drips as soon as possible. When a leak is detected a drip pan will be placed under the leaking vehicle to collect the drip.
e. The shop will provide a labeled location to empty and store drip pans.
f. If any leaks are discovered, a drip pan will be used to collect the fluids and vehicle will be scheduled for repairs.
g. Clean up all spills using dry methods.
h. Never store leaking vehicles over a storm drain.

3. Clean Up

a. Any leaks that are spilled on the asphalt will be cleaned up with dry absorbent; the dry absorbent will be swept up and disposed of in the garbage.
b. The paved surfaces around the building will be swept every two weeks, weather permitting.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Concrete Work

CONCRETE WORK

1. Preparation

a. Train employees and contractors in proper concrete waste management.
b. Store dry and wet materials under cover, away from drainage areas
c. Remove any damaged concrete that may need to be replaced.
d. Prepare and compact sub-base.
e. Set forms and place any reinforcing steel that may be required.
f. Determine how much new concrete will be needed.
g. Locate or construct approved concrete washout facility.

2. Process

a. Install inlet protection as needed.
b. Avoid mixing excess amounts of fresh concrete on-site.
c. Moisten subbase just prior to placing new concrete. This helps keep the soil from wicking moisture out of the concrete into the ground.
d. Place new concrete in forms.
e. Consolidate new concrete
f. Screed off surface
g. Let concrete obtain its initial set
h. Apply appropriate surface finish
i. Remove forms when concrete will not slump

3. Clean-up

a. Perform washout of concrete trucks and equipment in designated areas only
b. Do not washout concrete trucks or equipment into stormdrains, open ditches, streets or streams
c. Cement and concrete dust from grinding activities is swept up and removed from the site.
d. Remove dirt or debris from street and gutter.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Vehicle and Equipment Washing
City of Kingsport, TN	Stormwater Management	All Departments

WASHING

1. Preparation

a. Provide wash areas for small vehicles inside the maintenance building that has a drain system which is attached to the sanitary sewer system.
b. Provide wash areas for large vehicles on an approved outside wash pad that has a drain system which is attached to the sanitary sewer system.
c. No vehicle washing will be done where the drain system is connected to the storm sewer system.

2. Process

a. Minimize water and soap use when washing vehicles inside the shop building.
b. Soap should not be used when washing vehicles outside the shop building. Water Only.
c. Use hoses with automatic shut off nozzles to minimize water usage.
d. When washing outside the building, it is the operators' responsibility to make sure all wash water is contained on the wash pad and does not have access to the storm drain.
e. Never wash vehicles over or a storm drain.

3. Clean Up

a. Sweep wash areas after every washing to collect what solids can be collected to prevent them from washing down the drain system.
b. Clean solids from the settling pits on an as needed basis.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Pet Waste Management
City of Kingsport, TN	Stormwater Management	Parks and Recreation

PET WASTE MANAGEMENT

1. Preparation

a. Adopt and enforce ordinances that require pet owners to clean up pet wastes and use leashes in public areas. If public off-leash areas are designated, make sure they are clearly defined. Avoid designating public off-leash areas near streams and water bodies.

b. Whenever practical and cost effective, install dispensers for pet waste bags and provide disposal containers at locations such as trail heads or parks where pet waste has been a problem. Provide signs with instructions for proper cleanup and disposal.

2. Process

a. Check parks and trails for pet waste as needed.

b. Check public open space for pet waste prior to mowing.

c. Provide ordinance enforcement as needed.

3. Clean up

a. Remove all pet waste; provide temporary storage in a covered waste container, and dispose of properly. Preferred method of disposal is at a solid waste disposal facility.

4. Documentation

a. Document problem areas for possible increased enforcement and/or public education signs.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Parks and Open Space Management
City of Kingsport, TN	Stormwater Management	Parks and Recreation

Description

Parks and open space maintenance activities involves the disposal of clippings from mowing, planting, weeding, trees, hedges and shrubs; raking of leaves; disposal of garbage and litter; spraying of pesticides, fertilizing; and the cleaning and upkeep of park restrooms, buildings, and tables. Refer to the Fertilizer, Pesticide, and Herbicide Application procedure for information on the application of landscape chemicals. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

General

- Inspect newly landscaped areas on a regular basis after installed until the appropriate timing of maintenance is established.
- Report damage to landscape areas or bare areas void of vegetation that may result in sediment being transported off site.
- Collect and dispose of sediment from walkways and parking areas.
- Collect and dispose of trash from landscaped areas.
- Control run-off to limit soil erosion; do not use plastic under mulch, bark or wood chips, only use permeable fabrics.
- Do not attempt to clean up any unidentified or possibly hazardous materials found on or around landscaped areas during maintenance; notify the supervisor immediately upon discovery of hazardous materials.
- Refer to the Fertilizer, Pesticide, and Herbicide Application procedure for information on the application of landscape chemicals.

Possible Pollutants
Organics
Chemicals
Sediment
Fuel

Good Housekeeping
Secondary containment
Employee training

Related Procedures
Fertilizer, Herbicide, and Pesticide Application
Material Storage
Vehicle Fueling

Standard Operating Procedure

Mowing

- Remove paper, debris, and trash from the landscaped and surrounding areas and dispose of properly prior to mowing activities.
- Mulch-mow grasses whenever possible, do not allow any grass clippings to wash off into any drainage ways.
- Properly dispose of vegetation and other wastes after mowing, pulling weeds, and trimming.

Irrigation

- Any obvious problems such as broken sprinkler heads, ponded water, and dry, un-watered areas need to be reported immediately.
- Only irrigate at a rate which can infiltrate into the soil, limit run-off from watering lawns, and landscaping.

Landscape Equipment

- Brush off mowers (reels and decks) and tractors over grassy areas. Leave clippings on grassy areas or dispose of in trash or by composting. Do not hose off mowers over paved areas that drain to the storm drain system.
- Fuel all equipment following the Vehicle Fueling procedure.
- Maintain (including washing) all equipment by following the Heavy Equipment and Vehicle Maintenance procedure.

Potentially Hazardous Material

- Unidentifiable materials: DO NOT HANDLE OBJECT – CALL 911 or 9-911 from City facility phone.
- Used vehicle oil
  - Take to fleet maintenance and fill out log in foreman's office.
- Used car batteries
  - Take to fleet maintenance and fill out log in foreman's office.

Other Activities

- Install pet waste stations with bags and trash receptors in locations where pet waste has shown to accumulate.
- All port-a-potties should be placed in flat, secure locations where they are less likely to be knocked over. All port-a-potties should be in a location that would retain any spillage opposed to washing into storm sewer or waterway.

Employee Training

- Train applicable employees who are involved with parks and open space maintenance activities on this written procedure. Information regarding proper storage practices and how to prevent and report spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who are involved with
parks and open space maintenance activities.

Records

The following records could be used to document activities performed:

- Records of employee training with sign-in sheet.

Optional Additional Resources

City codes and ordinances that relate to parks and open space management, such as a noxious weed
ordinance.
List of municipal properties to manage and frequency of management.
Instructions on how to operate equipment.
Integrated pest management techniques.
Landscape planning.
Procedures for using non-municipal (e.g., volunteer) personnel

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Parking Lot Maintenance
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

PARKING LOT MAINTENANCE

1. Preparation

a. Conduct regular employee training to reinforce proper housekeeping.
b. Restrict parking in areas to be swept prior to and during sweeping using regulations as necessary.
c. Perform regular maintenance and services in accordance with the recommended vehicle maintenance schedule on sweepers to increase and maintain efficiency.

2. Process

a. Sweep parking areas, as needed, or as directed.
b. Hand sweep sections of gutter if soil and debris accumulate.
c. Pick-up litter as required to keep parking areas clean and orderly.

3. Clean-up

a. Dispose of sweepings properly (appropriate solid waste facility).
b. Street sweepers to be cleaned out in a manner as instructed by the manufacturer and in a location that swept materials cannot be introduced into a storm drain.
c. Swept materials will not be stored in locations where storm water could transport fines into the storm drain system.

4. Documentation

a. Keep work orders to track swept parking areas and approximate quantities.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Chemical Application (Pesticides, Herbicides and Fertilizers)
City of Kingsport, TN	Stormwater Management	Grounds Maintenance

CHEMICAL APPLICATION PESTICIDES, HERBICIDES, FERTILIZERS

1. Preparation

a. Make sure your state Chemical Handling Certification is complete and up-to-date before handling any chemicals.
b. Calibrate fertilizer and pesticide application equipment to avoid excessive application.
c. Use pesticides only if there is an actual pest problem.
d. Time and apply the application of fertilizers, herbicides or pesticides to coincide with the manufacturer's recommendation for best results ("Read the Label").
e. Know the weather conditions. Do not use pesticides if rain is expected within a 24-hour period. Apply pesticides only when wind speeds are low(less than 5 mph).

2. Process

a. Follow the manufacturer's recommendations for mixing, application and disposal. ("Read the Label").
b. Do not mix or prepare pesticides for application near storm drains, preferably mix inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
c. Employ techniques to minimize off-target application (e.g. spray drift, over broadcasting.) of pesticides and fertilizers.

3. Clean-up

a. Sweep or blow pavements or sidewalks where fertilizers or other solid chemicals have fallen, back onto grassy areas before applying irrigation water.
b. Triple rinse pesticide and herbicide containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
c. Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and their containers. ("Read the Label")

4. Documentation

a. Keep copies of MSD sheets for all pesticides, fertilizers and other hazardous products used.
b. Record fertilizing and pesticide application activities, including date, individual who did the application, amount of product used and approximate area covered.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Mowing and Trimming
City of Kingsport, TN	Stormwater Management	Grounds Maintenance

MOWING AND TRIMMING

1. Preparation

a. Review the overall process with all employees.
b. Check the oil and fuel levels of the mowers and other equipment; fill if needed.

2. Process

a. Protect catch basins where applicable.
b. Put on eye and hearing protection.
c. Mow and trim the lawn.
d. Sweep or blow clippings to grass areas.
e. Remove inlet protection.

3. Clean-up

a. Mowers are to be scraped and brushed at shop – dry spoils are dry swept and disposed of.
b. Wash equipment in approved wash station.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Planting Vegetation (Starters)
City of Kingsport, TN	Stormwater Management	*Grounds Maintenance*

PLANTING VEGETATION (STARTERS)

1. Preparation

a. Decide where any spoils will be taken.

2. Process

a. Dig holes; place spoils near the hole where they may easily be placed back around roots. Avoid placing spoils in the gutter.
b. Bring each plant near the edge of the hole dug for it.
c. Check the depth of the hole, and adjust the depth if necessary. The depth of the hole for a tree should be as deep as the root ball, so that the top of the root ball is level with the top of the hole.
d. Carefully remove pot or burlap.
e. Place the plant in the hole.
f. Backfill the hole with existing spoils, compost, and a litter fertilizer if desired. Do not use excessive amendments.
g. Water the plant.
h. Stake the plant, if necessary, to stabilize it.

3. Clean-up

a. Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed.
b. Sweep dirt from surrounding pavement(s) into the planter area
c. Transport spoils to their designated fill or disposal

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Planting Vegetation (Seeds)
City of Kingsport, TN	Stormwater Management	*Grounds Maintenance*

PLANTING VEGETATION (SEEDS)

1. Preparation

a. Decide on the application rate, method, water source, and ensure adequate materials are on hand.
b. Grade and prepare the soil to receive the seed. Place any extra soil in a convenient location to collect.

2. Process

a. Place the seed and any cover using the pre-determined application method (and rate).
b. Lightly moisten the seed.

3. Clean-up

a. Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed.
b. Sweep dirt, seed, and any cover material from surrounding pavement(s) into the planter area.
c. Transport spoils to their designated fill or disposal area.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Catch Basin Cleaning
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

CATCH BASIN CLEANING

1. Preparation

a. Clean sediment and trash off grate.
b. Do visual inspection on outside of grate.
c. Make sure nothing needs to be replaced.
d. Do inside visual inspection to see what needs to be cleaned.

2. Process

a. Clean using a high powered vacuum truck to start sucking out standing water and sediment.
b. Use a high pressure washer to clean any remaining material out of catch basin, while capturing the slurry with the vacuum.
c. After catch basin is clean, send the rodder of the vacuum truck downstream to clean pipe and pull back sediment that might have gotten downstream of pipe.
d. Move truck downstream of pipe to next catch basin.

3. Clean-up

a. When vacuum truck is full of sediment take it to the designated location to dump all the sediment out of truck into a drying bed.
b. When it evaporates, clean it up with a backhoe, put it into a dump truck and take it to the landfill.

4. Documentation

a. Keep logs of number of catch basins cleaned.
b. Record the amount of waste collected.
c. Keep any notes or comments of any problems.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Creek Management
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

CREEK MANAGEMENT

1. Preparation

a. Monitor streams on a regular basis (Suggested interval?).
b. Check culverts and crossings after every storm.
c. Maintain access to stream channels wherever possible.
d. Identify areas requiring maintenance
e. Determine what manpower or equipment will be required.
f. Identify access and easements to area requiring maintenance.
g. Determine method of maintenance that will be least damaging to the channel.
h. Obtain Stream Alteration Permit.

2. Process

a. Remove unwanted material (debris, branches, soil) from the creek channel and place it in a truck to be hauled away

3. Clean-up

a. Stabilize all disturbed soils.
b. Remove all tracking from paved surfaces near maintenance site, if applicable.
c. Haul all debris or sediment removed from area to approved dumping site.

4. Documentation

a. Keep log of actions performed including date and individuals involved.
b. Record the amount of materials removed or imported.
c. Keep any notes or comments of any problems.
d. Use “before” and “after” photographs to document activities as applicable.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Ditch Management
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

DITCH MANAGEMENT

1. Preparation

a. Monitor ditches on a regular basis (Suggested interval?).
b. Maintain access to ditch channels wherever possible.
c. Contact affected property owners and utility owners.

2. Process

a. Identify areas requiring maintenance
b. Determine what manpower or equipment will be required.
c. Identify access and easements to area requiring maintenance.
d. Determine method of maintenance that will be least damaging to the channel and adjacent properties or utilities.

3. Clean-up

a. Stabilize all disturbed soils.
b. Remove all tracking from paved surfaces near maintenance site, if applicable.
c. Haul all debris or sediment removed from area to approved dumping site.

4. Documentation

a. Keep log of actions performed including date and individuals involved.
b. Record the amount of materials removed or imported.
c. Keep any notes or comments of any problems.
d. Use “before” and “after” photographs to document activities as applicable.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Chip Seal
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

CHIP SEAL

1. Preparation

a. Clean and dry areas where materials are to be applied.
b. Apply temporary covers to manholes and catch basins to prevent oil and materials from getting inside of them.

2. Process

a. Apply emulsion at recommended rate.
b. Spread chips closely behind emulsion distributor, slowly such that the chips do not roll when they hit the surface.
c. Roll chips. Rollers follow closely behind the chip spreader. Roll entire surface twice.
d. Maximum speed 5 mph.

3. Clean-up

a. All loose aggregate is removed from the roadway by sweeping it up (see SOP for Street Sweeping).
b. Excessive asphalt applications and spills are removed with shovels and scraping tools.
c. Remove the temporary covers from manholes and catch basins. If it appears that any chip seal materials have gotten into the inlet boxes, remove the material according to the SOP for inlet boxes.
d. Dispose of the waste material that has been swept and scraped up by taking it to the landfill.

4. Documentation

a. Record location and date on the maintenance database and map

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Slurry Seal
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

SLURRY SEAL

1. Preparation
    a. Remove weeds from the roads.
    b. Sweep areas where materials are to be applied, and allow to dry, if necessary.
    c. Verify that existing pavement has been inspected for detrimental effects of poor drainage.
    d. Cover/protect catch basins and manholes.

2. Process
    a. Apply materials in a smooth and uniform manner. Slurry material should not run onto adjacent pavement surface, curb and gutter or waterways.

3. Clean-up
    a. If loose aggregate is remaining in street or curb, sweep it up.
    b. Ensure that excess emulsion materials are removed from the site and stored for later use in an area or container that is not exposed to the weather.
    c. Remove covers/protection from catch basins and manholes, and valves.

4. Documentation
    a. Record location and date on the maintenance database and map

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Overlays and Patching
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

OVERLAYS AND PATCHING

1. Preparation

a. Measure and mark locations of manholes and valves on the curb
b. Manholes and catch basins are covered as needed to prevent oil and materials from getting inside the structures or system.
c. Cracks should be properly sealed. Alligator cracks and potholes should be removed and patched. Rutting should be milled.
d. Surface should be clean and dry.
e. Uniform tack coat applied and cured prior to placement of overlay.
f. If milling is required, install inlet protection as needed.

2. Process

a. Check hot asphalt mix for proper temperature, percentage asphalt, gradation, air voids and any other agency requirements.
b. Raise manhole lids and valves to elevation of new asphalt surface with riser rings.
c. Surface texture should be uniform, no tearing or scuffing.
d. Rolling should be done to achieve proper in-place air void specification.

3. Clean-up

a. Covering should be removed as soon as the threat of imported materials entering the system is reduced and prior to a storm event.
b. After pavement has cooled, sweep gutters to remove loose aggregate.

4. Documentation

a. Record location and date on the maintenance database and map

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Crack Seal
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

CRACK SEAL

1. Preparation

a. Cover Manholes and catch basins to prevent oil and materials from getting inside the structures or system.
b. Remove weeds from the road
c. Air-blast the cracks to remove sediments from the crack to allow for proper adhesion.
d. Ensure that surface is clean and dry.

2. Process

a. Proper temperature of material should be maintained.
b. Sufficient material is applied to form the specified configuration.

3. Clean-up

a. Excessive sealant application or spills are removed.
b. Sweep all loose debris from the pavement and dispose of it in the local landfill.

4. Documentation

a. Record location and date on the maintenance database and map

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Shouldering
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

SHOULDERING

1. Preparation

a. Set up temporary traffic control devices.

2. Process

a. Place import material as needed and perform grading to achieve proper drainage.
b. Mulch clippings to help reduce the amount of supplemental fertilizer required

3. Clean-up

a. Clean any loose material off asphalt or gutter.

4. Documentation

a. Record location and date on the maintenance database and map

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Secondary Road Maintenance
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

SECONDARY ROAD MAINTENANCE

1. Preparation

a. Determine length amount and type of roadbase or gravel that will be needed.
b. Determine proper equipment to be used and or any safety hazards.
c. Design proper drainage: slopes, berms etc.

2. Process

a. Have truck drivers follow a designated route for hauling in the soil (See SOP for Soil and Gravel).
b. If soil is too dry to achieve compaction, loosen surface material and moisture condition.
c. Smooth or grade soil with the desired crown or cross-slope.
d. Compact soil.

3. Clean-up

a. Replace filter fabric with washed rock (if necessary) on monthly maintenance.
b. Clean up equipment according to the SOP for Cleaning Equipment
c. Clean up any debris on traveled roads, and dispose of it in the landfill.

4. Documentation

a. Fill out daily activity report in log book or journal. Include date, time, personnel, and location.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Snow Removal and De-icing
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

SNOW REMOVAL AND DE-ICING

1. Preparation

a. Store de-icing material under a covered storage area or in an area where water coming off the de-icing materials is collected and delivered to the sanitary sewer or reused as salt brine.
b. Slope loading area away from storm drain inlets
c. Design drainage from loading area to collect runoff before entering storm water system
d. Wash out vehicles (if necessary) in approved washout area before preparing them for snow removal.
e. Calibrate spreaders to minimize amount of de-icing material used and still be effective
f. Provide vehicles with spill cleanup kits in case of hydraulic line rupture or other spills
g. Train employees in spill cleanup procedures and proper handling and storage of de-icing materials

2. Process

a. Load material into trucks carefully to minimize spillage
b. Periodically dry sweep loading area to reduce the amount of de-icing materials exposed to runoff
c. Distribute the minimum amount of de-icing material to be effective on roads
d. Do not allow spreaders to idle while distributing de-icing materials.
e. Park trucks loaded with de-icing material inside when possible

3. Cleanup

a. Sweep up all spilled de-icing material around loading area
b. Clean out trucks after snow removal duty in approved washout area
c. Provide maintenance for vehicles in covered area
d. If sand is used in de-icing operations, sweep up residual sand from streets when weather permits

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Street Sweeping
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

STREET SWEEPING

1. Preparation

a. Prioritize cleaning routes to use at the highest frequency in areas with the highest pollutant loading.
b. Restrict street parking prior to and during sweeping using regulations as necessary
c. Increase sweeping frequency just before the rainy season, unless sweeping occurs continuously throughout the year.
d. Perform preventative maintenance and services on sweepers to increase and maintain their efficiency

2. Process

a. Streets are to be swept as needed or specified by the city. Street maps are used to ensure all streets are swept at a specified interval
b. Drive street sweeper safely and pickup debris
c. When full, take the sweeper to an approved street sweeper cleaning station.

3. Clean-up

a. Street sweepers are to be cleaned out in an approved street sweeper cleaning station
b. Street sweeping cleaning stations shall separate the solids from the liquids.
c. Once solids have dried out, haul them to the local landfill
d. Decant water is to be collected and routed to an approved wastewater collection system area only.
e. Haul all dumped material to the landfill.

4. Documentation

a. Keep accurate logs to track streets swept and streets still requiring sweeping.
b. Log the amount of debris collected and hauled off.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Transporting Soil and Gravel
City of Kingsport, TN	Stormwater Management	Water/Sewer/Storm

TRANSPORTING SOIL AND GRAVEL

1. Preparation

a. Dry out wet materials before transporting.
b. Spray down dusty materials to keep from blowing.
c. Make sure you know and understand the SWPPP requirements for the site you will be working at.
d. Determine the location that the truck and other equipment will be cleaned afterwards

2. Process

a. Use a stabilized construction entrance to access or leave the site where materials are being transported to/from.
b. Cover truck bed with a secured tarp before transporting.
c. Follow the SWPPP requirements for the specific site to/from which the materials are being hauled.
d. Make sure not to overfill materials when loading trucks.

3. Clean up

a. Use sweeper to clean up any materials tracked out on the roads from site.
b. Wash out truck and other equipment when needed in properly designated areas.

4. Documentation

a. Keep records of any material that is tracked out of site and what was done to clean it up and how long it took to clean up and what the weather conditions were at the time.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Utility and Storm Sewer System Maintenance
City of Kingsport, TN	Stormwater Management	Streets/Water/Sewer

Description

This fact sheet addresses utility and storm sewer system maintenance. Utilities include sewer and potable water conveyance systems. The storm sewer system includes pipes, catch basins, inlets, outlets, culverts, detention and retention ponds, and drainageways. The storm sewer system is cleaned as part of routine maintenance and on an emergency basis in the event of flooding. Maintaining the storm sewer system on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore the system's sediment trapping capability, and ensure the system functions properly to avoid flooding. Flooding, ponding, and uncontrolled sheet flow can result in property damage and increase soil erosion and tracking of soil onto city streets. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

General

- Follow the inspection and maintenance schedules for utility and storm sewer systems. Where feasible, grading activities will be scheduled during dry weather.
- Where feasible, schedule maintenance activities during dry weather.
- Monitor the jet/vacuum truck closely for leaks and use a drip pan as needed.
- Wash and fuel the jet/vacuum truck per the Equipment/Vehicle Maintenance procedure.
- Stay alert for any signs of illicit discharges. This includes "dry weather" flows or pipes or hoses emptying into the storm sewer system.
- Report any suspicious discharges or dumping to your supervisor.

Possible Pollutants

Sediment
Nutrients
Metals
Hydrocarbons
Trash

Good Housekeeping

Waste Management
Employee/Contractor Training
Proper Cleanup and Disposal Procedures

Related Procedures

Heavy Equipment and Vehicle Maintenance
Parks and Open Space Maintenance
Spill Prevention and Response
Street, Curb, and Gutter

Standard Operating Procedure

• Storm sewer system maintenance wastes may be either non-hazardous or hazardous. Solid nonhazardous waste may be disposed in a sanitary landfill or recycled. Liquid non-hazardous wastes must be evaporated or discharged to the sanitary sewer system before disposing of it into the landfill. Hazardous waste must be transported and disposed of at a permitted disposal or treatment facility.

• Do not temporarily store collected storm system cleaning debris adjacent to any surface water, storm drain inlet, or drainageway.

Storm Sewer System Pipes

• Clean storm sewer system pipes by jetting the pipes and using a jet/vacuum truck to remove the material.

o Set the truck over the manhole downstream from the pipeline to be jetted.

o Jet water up against flow to the upstream manhole. Jet back downstream controlling pressure to avoid service interruptions in low areas.

o Vacuum the debris and washwater.

o After jetting the pipe, hose down manhole and jetting nozzle inside of manhole before bringing to surface.

o Spills and oversprays will be washed and vacuumed clean.

Catch Basins, Inlet and Outlet Structures, and Culverts

• Manual cleaning

o Bail out sediment-laden water with a shovel into the street then dispose of it into a truck. Or, crew enters catch basin and fills buckets with sediment that are then carried to a dump truck. Clean water is used to refill the catch basin.

• Vacuum cleaning

o Set the truck over the manhole downstream from the pipeline to be jetted.

o Jet water up against flow to the upstream manhole. Jet back downstream controlling pressure to avoid service interruptions in low areas.

o Vacuum the debris and washwater.

o After jetting the pipe, hose down manhole and jetting nozzle inside of manhole before bringing to surface.

o Spills and oversprays will be washed and vacuumed clean.

• Replace or maintain “no dumping” plaques as necessary.

• Remove trash from trash racks and grated openings.

Detention and Retention Ponds

• Inspect the outlet works and remove trash from the trash racks and grated openings. Also remove vegetation adjacent to the outlet works to minimize clogging.

• Use a skimmer; a device that strains large debris, in front of the pump and filter to prevent mostclogging problems. Remove and service the fountains and aerator motors as recommended.
• Immediately report noticeable damage to the pond requiring additional maintenance.
• Report any suspected water quality problems if the water is suspected to be contaminated due to a change in vegetation growth or appearance.
• Inspect side slopes of the pond for areas eroding or requiring vegetation. Seed and cover with erosion control blanket to reestablish vegetation cover to prevent erosion.
• Inspect for plants on the state's noxious weed list that need to be treated.
• Perform mosquito and vector control activities per municipal and state guidelines.

Drainageways

Drainageways include drainage channels, ditches, grass swales, and washes.
• Conduct maintenance of drainageways in a series of sections or phases over several years to minimize erosion if extended drainageway lengths are involved.
• Insure all head gates, valves, and flumes are working properly.
• Inspect outfall pipes leading to drainageways for erosion and repair if necessary.
• Remove trash and debris from the drainageways, grates, flumes, and headgates and properly dispose of material in a covered trash container or remove it to an approved landfill as soon as possible.
• Flush out/dig out the drainageway, as necessary, to remove sediment which could impede the flow. The entire drainageway may need to be regraded if the invert has filled in with silt.
• If feasible, repair any areas where rip rap has fallen out of place or collapsed. Schedule maintenance
if additional repairs are needed.
• Trim trees and shrubs as necessary.
• Inspect the drainageways for any signs of erosion, leaking, and damage. Maintain and repair damaged or washed out portions of drainageway embankments and easements.
• Inspect all signs and repair and replace as necessary.
• Leave a riparian fringe when mowing drainageways to catch pollutants before reaching the drainageway. Do not leave grass clippings in the drainageway. Do not apply landscape chemicals
in the channel area.
• Identify noxious weeds and apply treatment to eliminate as specified by the municipality.

Potable Line Flushing

• Remove any debris from the inlet that will be used for the flushed water.
• Connect the hydrant being flushed with a dechlorinating diffuser.
• Direct the flow downstream to the nearest inlet.
• Keep inlet clear of debris during the flushing operation.

Waterline Breaks

• Contain spoils away from the storm sewer systems (e.g., inlets, drainage way) by building berms
around the excavation area.
• Install inlet protection downstream of waterline break to prevent sub-grade material from entering
storm sewer system.
• Dewater the excavation by using a vacuum truck.

- Flush the pipe after the repair by using a dechlorinating diffuser.
- Clean streets from any debris and sediment deposited as a result of the waterline break.

Sanitary Sewer Backup

- Jet upstream from the first dry manhole.
- Clear line stoppage to prevent backup into house basements and manhole overflows.
- Contain overflows by blocking nearby storm sewer system inlets.
- Clean up spills by washing and vacuuming the affected areas.

Safety

- Safety training and awareness play a significant part in the maintenance of utility and storm sewer systems.
- It is also important to be aware of the work environment as maintenance activities require limited clearance to buildings, working near high wire electrical poles, underground utilities, narrow ditch banks, standing water, other municipal staff, and many other safety related concerns.
- Weather conditions also dictate safety as snow, rain, ice, mud, heat and cold can all contribute to the working conditions.
- Subsurface inspections, if necessary, will be conducted in accordance with confined space entry procedures.
- Applicable personal protective equipment will be worn at all times.

Employee Training

- Train applicable employees who perform utility and storm sewer system activities on this written procedure. Information regarding how to avoid and report spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who perform utility and storm sewer system activities.

Records

The following records could be used to document activities performed:

- Records of employee training with sign-in sheet.

Optional Additional Resources

City codes and ordinances that relate to utility or storm sewer system maintenance.
Inspection and maintenance frequency plan for the storm sewer system.
Specific instructions on how to operate applicable equipment.
Instructions on how to track the amount of debris collected

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Salt Storage
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

Description

Deicers, including salt and sand, are commonly used during snow removal activities. Improper handling of deicers, salt and sand can contribute pollutants to waterways. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

Solid Deicer Storage

- Deicers should be stored under cover, such as inside a covered structure or under a tarp.
- Containment barriers should be placed to prevent transport of the material beyond the storage area unless stored inside a structure.
- Whenever possible, storage areas should be outside of the 100-year floodplain for protection against flooding.
- Any temporary salt and sand storage areas should be protected from erosive forces of wind and rain.
- Do not overload material spreaders.
- Sweep the area outside of the material storage area after loading and unloading.

Liquid Deicer Storage

- Establish liquid deicer inventory controls to minimize the amount of deicer used and stored.
- Store tanks/containers in a location where they will not be accidentally damaged by equipment or vehicles.
- Periodically inspect storage tanks/containers to ensure that all materials are being stored properly when not in use.
- Clean the storage tank/container area when necessary using dry clean up methods.
- Follow all State and Federal above-ground and underground storage tank requirements.

Possible Pollutants
Sediment
Chemicals

Good Housekeeping
Covered outdoor storage areas
Dry clean up methods
Employee training

Related Procedures
Heavy Equipment and Vehicle Maintenance
Material Storage
Salt and Sand Storage
Snow and Ice Control
Snow Storage

Standard Operating Procedure

- When receiving bulk deliveries or when loading liquid deicers into truck mounted tanks, minimize leaks and clean up spills as soon as they occur.

Employee Training

- Train applicable employees who are involved in salt and sand storage activities on this written procedure. Information on proper storage practices and on how to prevent and report spills will be presented during training.
- Periodically conduct refresher training on the SOP for applicable employees who are involved in salt and sand storage activities.

Records

The following records could be used to document activities performed:

- Record of any major spills and the action taken.
- Records of employee training with sign-in sheet.

Optional Additional Resources

City codes and ordinances that relate to salt and sand storage.
Chemical purchasing policies.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Salt Application
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

Description

Deicers can contaminate surface and ground water and damage vegetation adjacent to roadways. Salt will change the chemical balance of local waterways and sand can be picked up by stormwater resulting in higher dissolved and suspended sediment loads in waterways. Sand also presents an air quality concern. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

Plowing

- Inspect plowing equipment for leaks prior to use. Follow the Equipment and Vehicle Maintenance procedure for responding to leaking vehicles.
- Take care when connecting or releasing plow shovels and clean up any hydraulic fluid that may leak onto the pavement.
- Wash snow removal equipment only at approved washing stations following the Outdoor Vehicle Maintenance procedure.
- Do not pile snow in front of storm sewer inlets to allow inflow of snowmelt runoff.

Deicer Application

- Apply only the recommended amount of deicer to roadways.
- Spreaders should be calibrated at the beginning of each season and inspections for maintenance or repair should be conducted after each storm.
- As soon as weather conditions allow, follow-up with street sweeping to remove remaining deicer from roadways.

Possible Pollutants
Sediment
Toxics

Good Housekeeping
Dry cleanup methods
Employee training

Related Procedures
Heavy Equipment and Vehicle Maintenance
Material Storage
Salt and Sand Storage
Snow Storage
Spill Prevention and Response
Vehicle fueling

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Trash and Garbage Collection
City of Kingsport, TN	Stormwater Management	Streets and Sanitation

Description

All solid and liquid wastes must be disposed of properly. Some of the most common sources of pollution at municipal facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

General

- Provide cover, if feasible, for all waste storage areas including keeping dumpster lids closed.
- Provide a low containment berm, if feasible, around waste storage areas.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.
- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- Follow the Spill Prevention and Response procedure to respond to and clean up any spills or leaks.
- Clean storage areas when necessary using dry clean up methods (except in areas where the wash water will enter the sanitary sewer and is an approved discharge).
- Return dumpsters to the supplier when cleaning is necessary or if the dumpster is leaking.
- Properly handle and dispose of all hazardous wastes. See the Outdoor Material Storage procedure for more information.

Possible Pollutants

Construction Debris
Organics
Oil and Grease
Trash
Metals
Paint
Toxins

Good Housekeeping

Dumpster/waste management
Employee/Contractor Training
Proper cleanup and disposal procedures
Dry cleaning methods
Stormwater retrofits

Related Procedures
Large Outdoor Festivals and Events
Outdoor Material Storage
Spill Prevention and Response
Street Sweeper Cleaning and Waste

Standard Operating Procedure

Solid Waste

- Solid waste that cannot be recycled should be disposed of in the trash dumpster.
- Recycle solid wastes when possible, including the following:
  - Glass
  - Plastic containers
  - Cardboard and Paper
  - Organic material
  - Scrap metal
  - Wood debris
  - Used batteries
  - Used oil filters
  - Light bulbs
- Follow the Street Sweeper Cleaning and Waste procedure for proper disposal of street sweepings.

Liquid Waste

- Never place liquids in a dumpster.
- If unable to recycle, old latex paints should be mixed with floor dry or other adsorbent material to solidify prior to disposal in the trash.
- If unable to recycle, enamels and other oil-based paints should be applied to cardboard, newspaper, or similar materials and allowed to dry prior to disposal in the trash.
- Recycle liquid wastes, including the following:
  - Used oil
  - Used antifreeze
  - Used solvents

Employee Training

- Train applicable employees who dispose of wastes on this written procedure. Information on how to avoid and report spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who dispose of wastes.

Records

The following records could be used to document activities performed:

- Records of employee training with sign-in sheet.

Optional Additional Resources

Frequency of trash and recycling pick ups.
List of Recycling Sites:
List of Companies Accepting Hazardous Waste

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Painting
City of Kingsport, TN	Stormwater Management	Traffic

CURB PAINTING

1. Preparation

a. Calculate the amount of paint required for the job
b. Use water based paints if possible.
c. Determine whether the wastes will be hazardous or not and the required proper disposal of said wastes
d. Determine locations of storm drain inlets and sewer inlets that may need to be protected
e. Prepare surfaces to be painted without generating wastewater by sandblasting and/or scraping.
f. Thoroughly sweep up all sand, blasting, and/or paint scrapings
g. If paint stripping is needed, use a citrus-based paint remover whenever possible, which is less toxic than chemical strippers?
h. If wastewater will be generated, use curb, dyke, etc. around the activity to collect the filter and collect the debris.

2. Process

a. Paint curb.
b. Prevent over-spraying of paints and/or excessive sandblasting
c. Use drip pans and drop clothes in areas of mixing paints and painting
d. Store latex paint rollers and brushes in air tight bags to be reused later with the same color.
e. Have available absorbent material and other BMP's ready for an accidental paint spill.

3. Clean-up

a. Paint out brushes and rollers as much as possible. Squeeze excess paint from brushes and rollers back into the containers prior to cleaning them.
b. Pour excess paint from trays and buckets back into the paint can containers and wipe with cloth or paper towels. Dispose of the towels according to the recommendations on the paint being used.
c. Rinse water-based paint brushes in the sink after pre-cleaning. Never pour excess paint or wastewater from cleanup of paint in the storm drain.
d. Cleanup oil based paints with paint thinner. Never clean oil based brushes in a sink or over a storm drain. Filter solvents for reuse if possible and/or store in approved drum for recycling.
e. Dispose of waste collected by placing it in a garbage container. Left-over paint and solvents should be stored for later use (do not place these liquids in the garbage).

4. Documentation

a. Write-up/report of any discharges into storm drain system

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Planned Excavation Repair / Replacement
City of Kingsport, TN	Stormwater Management	Water/Sewer Maintenance

PLANNED EXCAVATION REPAIR / REAPLACEMENT

1. Preparation

a. Determine where discharge flow will go
b. Place inlet protection at nearest downstream storm drain inlet
c. Clean gutters leading to inlet
d. Isolate area to be worked on
e. Neutralize any chlorine residual/pathogens before discharging water

2. Process

a. Make efforts to keep water from pipeline from entering the excavation
b. Direct any discharge to pre-determined area
c. Backfill and compact excavation
d. Haul of excavated material or stock pile nearby

3. Clean up

a. Clear gutter/waterway where water flowed
b. Clean up all areas around excavation
c. Clean up travel path of trucked material

4. Documentation

a. Complete documentation

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Unplanned Excavation Repair / Replacement
City of Kingsport, TN	Stormwater Management	Water/Sewer Maintenance

UNPLANNED EXCAVATION REPAIR / REAPLACEMENT

1. Preparation

a. Make sure service trucks have wattles, gravel bags, or other materials for inlet protection.

2. Process

a. Slow the discharge.
b. Inspect flow path of discharged water
c. Protect stormwater inlet areas
d. Follow planned repair procedures.
e. Haul off spoils of excavation
f. Consider use of silt filter bags on pumps

3. Clean-up

a. Repair eroded areas as needed
b. Follow planned repair procedures
c. Clean up the travel path of trucked excavated material

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Waterline Flushing for Routine Maintenance
City of Kingsport, TN	Stormwater Management	Water Maintenance

WATERLINE FLUSHING FOR ROUTINE MAINTENANCE

1. Preparation

a. Determine flow path of discharge to inlet of waterway.
b. Determine chlorine residual
c. Neutralize chlorine residual

2. Process

a. Clean flow path.
b. Protect inlet structures.
c. Use diffuser to dissipate pressure to reduce erosion possibilities.

3. Clean-up

a. Clean flow path
b. Remove inlet protection.

4. Documentation

a. Residual tests of discharge water.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Equipment and Vehicle Maintenance
City of Kingsport, TN	Stormwater Management	Fleet

Description

Regular maintenance of city vehicles and equipment, or city-contracted vehicles and equipment prolongs the life of the city's assets and prevents the leaking of hazardous fluids commonly associated with normal wear and tear of vehicles and equipment. Potential pollutants generated at vehicle maintenance facilities include oil, antifreeze, brake fluid and cleaner, solvents, batteries and fuels. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

Maintenance activities should be performed inside a Municipal Services Center building unless the equipment is too large to fit inside or temporary repairs need to be made before the equipment can be moved to the maintenance building. Consult the Outdoor Fleet Maintenance procedure when it is necessary to perform repairs outside of the facility (breakdowns, service calls, etc.).

Vehicle Storage

- Monitor vehicles and equipment closely for leaks and use drip pans as needed until repairs can be performed.
- When drip pans are used, check frequently to avoid overtopping and properly dispose of fluids.
- Drain fluids from leaking or wrecked vehicles and from motor parts as soon as possible. Dispose of fluids properly.

Possible Pollutants

Metals
Toxins
Solvents (degreasers, paint thinners, etc.)
Antifreeze
Brake fluid and brake pad dust
Battery acid
Motor oil
Fuel (gasoline, diesel, kerosene)
Lubricating grease

Good Housekeeping

Drip pans
Tarps
Covered outdoor storage areas
Secondary containment
Proper disposal of used fluids
Spill cleanup materials
Dry cleanup methods
Employee training

Related Procedures
Material Storage
Outdoor Fleet Maintenance
Spill Prevention and Response
Street Sweeper Cleaning and Waste
Vehicle Fueling
Vehicle Washing

Standard Operating Procedure

Vehicle Maintenance

- Conduct routine inspections of heavy equipment and vehicles to proactively identify potential maintenance needs.
- Perform routine preventive maintenance to ensure heavy equipment and vehicles are operating optimally.
- Recycle or dispose of all wastes properly and promptly.
- Do not dump any liquids or other materials outside, especially near or in storm drains or ditches. Sweep and pick up trash and debris as needed.

Body Repair and Painting

- Whenever possible, conduct all body repair and painting work indoors.
- Use dry cleanup methods such as vacuuming or sweeping to clean up all metal filings, dust, and paint chips from grinding, shaving, and sanding, and dispose of the waste properly. Debris from wet sanding can be allowed to dry overnight on the shop floor, then swept or vacuumed. Never discharge these wastes to the storm or sanitary sewer system.
- Minimize waste from paints and thinners by carefully calculating paint needs based on surface area and using the proper sprayer cup size.
- Do not use water to control over-spray or dust in the paint booth unless this wastewater is collected. This water should be treated and permission must be granted by the wastewater treatment plant prior to discharge into the sanitary sewer system.
- Do not dispose of spray gun cleaner waste in the storm drain.
- Use sanding tools equipped with vacuum capability (if available) to pick up debris and dust.

Material Management

- Store maintenance materials and waste containers (e.g., used oil and antifreeze) in labeled containers under cover or in secondary containment (e.g., double-walled tanks). Chemicals should not be combined in containers.
- All hazardous wastes must be labeled and stored according to hazardous waste regulations.
- Carefully transfer fluids from collection devices to designated storage areas as soon as possible. Do not store the transferred fluids adjacent to the containers (for example, oil drip pans with used oil in them should not be placed next to the used oil tank).
- Store new batteries securely to avoid breakage and acid spills.
- Store used batteries indoors or in secondary containment to contain potential leaks. Recycle used batteries.
- Conduct periodic inspections of storage areas to detect possible leaks.
- Do not wash or hose down storage areas except where wash water will enter the sanitary sewer as an approved discharge. Use dry clean-up methods whenever possible.
- Keep lids on waste barrels and containers, and store them indoors or under cover to reduce exposure to rain.

• Periodically inspect and maintain all pretreatment equipment, including sumps, separators, and grease traps to ensure proper functioning.

Parts Cleaning

• Use designated areas for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. If parts cleaning equipment is not available, use drip pans or other containment to capture parts cleaning fluids.
• Use steam cleaning or pressure washing of parts whenever possible instead of solvent cleaning.
• When steam cleaning or pressure washing, only discharge wastewater to an oil/water separator connected to the sanitary sewer.
• When using solvents to clean parts, rinse and drain parts over the designated solvent tank so that fluids will not drip or spill onto the floor. Use drip boards or pans to catch excess solutions and divert them back to the tank. Allow parts to dry over the hot tank.
• Recycle cleaning solution when it becomes too dirty to use. Never discharge cleaning waste to the sanitary sewer or storm sewer.

Vehicle and Equipment Washing

• Vehicles should be washed in the city's vehicle and equipment wash area/bay or taken to a commercial car wash.

Employee Training

• Train applicable employees who perform heavy equipment and vehicle maintenance on this written procedure. Information regarding how to avoid and report spills will be presented during the training.
• Periodically conduct refresher training on the SOP for applicable employees who perform heavy equipment and vehicle maintenance.

Records

The following records could be used to document activities performed:
• Record of any major spills and the action taken.
• Records of employee training with sign-in sheet.
• Heavy equipment and vehicle maintenance logs.

Optional Additional Resources

City codes and ordinances that relate to vehicle and equipment maintenance.
Chemical purchasing policies.
Loading and unloading bulk materials.
Guidelines for staff to dedicate a percentage of their time to vehicle and equipment maintenance.
Specific directions on how to use the city's vehicle wash area.
Spill Prevention Control and Countermeasures Plan

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** Outdoor fleet Maintenance
City of Kingsport, TN	Stormwater Management	Fleet

Description

Although it is recommended that fleet maintenance activities be conducted indoors or under cover, it is sometimes necessary to perform fleet maintenance outdoors (e.g., equipment is too large to fit inside the maintenance building, temporary repairs need to be made before the equipment can be moved to the maintenance building, breakdowns, service calls).
Some potential pollutants typically associated with outdoor fleet maintenance activities include oil, antifreeze, brake fluid and cleaner, solvents, batteries, and fuels. Consult the Spill Prevention and Response procedure and the Vehicle Fueling procedure for additional information on those topics. When services are contracted, this written procedure should be provided to the contractor so they have the proper operational procedures. In addition, the contract should specify that the contractor is responsible for abiding by all applicable city, state, and federal codes, laws, and regulations.

Procedures

Fleet Maintenance

- Fleet maintenance should be performed inside whenever possible.
- If indoor maintenance is not possible, ensure maintenance is performed in a location where contact with stormwater is minimized, through berming and appropriate routing of drainage.
- Provide inlet protection (berms, weighted inlet covers, etc.) for all adjacent inlets when work is occurring in close proximity to a storm drain inlet.
- Have absorbent pads and drip pans accessible to capture leaks and spills during maintenance activities.
- Keep equipment clean and do not allow excessive build-up of oil and grease.
- Perform regular preventative maintenance to minimize the occurrence of leaks and major repairs.
- Recycle and/or dispose of all wastes properly and promptly.

Possible Pollutants

Metals
Toxins
Solvents (degreasers, paint thinners, etc.)
Antifreeze
Brake fluid and brake pad dust
Battery acid
Motor oil
Fuel (gasoline, diesel, kerosene)
Lubricating grease

Good Housekeeping

Drip pans
Tarps
Covered outdoor storage areas
Secondary containment
Proper disposal of used fluids
Spill cleanup materials

Dry cleanup methods
Employee training

Related Procedures
Heavy Equipment and Vehicle Maintenance
Material Storage
Spill Prevention and Response
Vehicle Fueling

- Do not dump any liquids or other materials outside, especially near or in storm drains or ditches. Sweep and pick up trash and debris as needed.
- Clean up spills promptly using dry methods (do not hose down). Consult the Spill Prevention and Response procedure for more information. Cleanup is completed only after absorbent and rags are disposed of properly.

Body Repair and Painting

- Whenever possible, conduct all body repair and painting work indoors.
- Use dry cleanup methods such as vacuuming or sweeping to clean up all metal filings, dust, and paint chips from grinding, shaving, and sanding. Dispose of the waste properly. Debris from wet sanding can be allowed to dry overnight, then swept and vacuumed. Liquid from wet sanding should not be allowed to enter the storm drain. Never discharge these wastes to the storm or sanitary sewer systems.
- Minimize waste from paints and thinners by carefully calculating paint needs based on surface area and using the proper sprayer cup size.
- Clean spray guns in a self-contained cleaner. Do not dispose of cleaner waste in the storm drain.
- Use sanding tools equipped with vacuum capability (if available) to pick up debris and dust.

Material Management

- Store maintenance materials and waste containers (e.g., used oil and antifreeze) in labeled containers under cover or in secondary containment (e.g., double-walled tanks). Chemicals should not be combined in containers.
- All hazardous wastes must be labeled and stored according to hazardous waste regulations.
- Carefully transfer fluids from collection devices to designated storage areas as soon as possible.

Do not store the transferred fluids adjacent to the containers.

- Store new batteries securely to avoid breakage and acid spills.
- Store used batteries indoors or in secondary containment to contain potential leaks. Recycle used batteries.
- Conduct periodic inspections of storage areas to detect possible leaks.
- Do not wash or hose down the storage area except in areas where the wash water will only enter the sanitary sewer drain as an approved discharge. Use dry clean-up methods as often as possible.
- Keep lids on waste barrels and containers, and store them indoors or under cover to reduce exposure to rain.
- Periodically inspect and maintain all pretreatment equipment, including sumps, separators, and

grease traps to ensure proper functioning.

Parts Cleaning

- Use designated areas for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. If parts cleaning equipment is not available, use drip pans or other containment to capture parts cleaning fluids.
- Use steam cleaning or pressure washing of parts whenever possible instead of solvent cleaning.
- When steam cleaning or pressure washing is used, only discharge wastewater to an oil/water separator connected to the sanitary sewer.
- When using solvents, rinse and drain parts over the designated solvent tank so that fluids will not drip or spill onto the floor. Use drip boards or pans to catch excess solutions and divert them back to the tank. Allow parts to dry over the hot tank.
- Recycle cleaning solution when it becomes too dirty to use. Never discharge cleaning waste to the storm or sanitary sewer systems.

Vehicle and Equipment Washing

- Vehicles should be washed, whenever possible, in the city's vehicle and equipment wash area/bay or taken to a commercial car wash.

Employee Training

- Train applicable employees on this written procedure. Information regarding how to avoid and report spills will be presented during the training.
- Periodically conduct refresher training on the SOP for applicable employees who perform outdoor vehicle maintenance.

Records

The following records could be used to document activities performed:

- Record of any major spills and the action taken.
- Records of employee training with sign-in sheet.
- Heavy equipment and vehicle maintenance logs.

Optional Additional Resources

City codes and ordinances that relate to fleet maintenance.
Chemical purchasing policies.
Guidelines for staff to dedicate a percentage of their time to vehicle and equipment maintenance.
Specific directions on how to use the municipality's vehicle wash area.
Spill Prevention Control and Countermeasure Plan

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** IDDE – Call-in Inspections
City of Kingsport, TN	Stormwater Management	Stormwater

IDDE – CALL-IN INSPECTIONS

1. Preparation

a. Have a system in place to receive phone calls and collect information regarding suspected illicit discharges.

2. Process

a. Use the Incident Tracking Sheet to collect the appropriate information from the caller. Then, transfer the Incident Tracking Sheet to the proper authority (ie. department head, stormwater specialist, construction inspector, code enforcement officer, or other assigned personnel).
b. Promptly investigate reported incidents within 7 days.
c. If an illicit discharge of unknown source is confirmed, follow the procedure of SOP IDDE - Tracing Illicit Discharges.
d. If an illicit discharge known source is confirmed, follow the procedure of SOP IDDE - Removing Illicit Discharges.

3. Clean up

a. Clean catch basin, clean storm drain, or initiate spill response, as applicable. Follow relevant SOPs.

4. Documentation

a. File all completed forms (ie. incident tracking, catch basins cleaning, storm drain cleaning.
b. Document any further action taken.
c. Review incidents reported by citizens on an annual basis to look for patterns of illicit discharges and to evaluate the call-in inspection program.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** IDDE - Opportunistic Illicit Discharge Observation
City of Kingsport, TN	Stormwater Management	Stormwater

IDDE – OPPORTUNISTIC ILLICIT DISCHARGE OBSERVATION

1. Preparation

a. Be alert for potential illicit discharges to the municipal storm water system while going about normal work activities.

2. Process

a. Call the appropriate authority (ie. department head, stormwater specialist, construction inspector, code enforcement officer or a supervisor) if you see evidence of an illicit discharge.
b. Assess the general area of the illicit discharge to see if you can identify its source.
c. Whenever possible, take photographs of the suspected illicit discharge.
d. Responding stormwater department personnel or code enforcement officer will complete the following:
e. Use the IDDE Incident Tracking Sheet to document observations.
f. Obtain sample for visual observation and complete an Outfall Inspection Form, if applicable.
g. Follow the procedure of SOP IDDE - Tracing Illicit Discharges.

3. Clean-up

a. Clean catch basin, clean storm drain, or initiate spill response, as needed. Follow relevant SOPs.

4. Documentation

a. File all completed forms (ie. Incident Tracking Form, Outfall Inspection Form, Catch Basin Cleaning Form, and Storm Drain Cleaning Log).
b. Document any further action taken.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** IDDE - Outfall Inspections
City of Kingsport, TN	Stormwater Management	Stormwater

IDDE – OUTFALL INSPECTIONS

1. Preparation

a. Know the past and present weather conditions. Conduct inspections during dry weather periods.
b. Gather all necessary equipment including: tape measure, clear container, clipboard with necessary forms, flashlight, and camera (optional).
c. Obtain maps showing outfall locations and identifiers.
d. Obtain outfall description and observations from previous inspections, so the outfall can be accurately identified and observations compared.

2. Process

a. Perform an inspection of each outfall every permit cycle. Whenever, possible use the same personnel for consistency in observations.
b. Identify each outfall with a consistent and unique identifier. Use maps and previous inspection reports to confirm the outfall identity and location.
c. If dry weather flow is present at the outfall, then document and evaluate the discharge by completing the following steps:

1. Collect field samples for visual observations in a clean, clear container and in a manner that avoids stirring up sediment that might distort the observation.
2. Characterize and record observations on basic sensory and physical indicators (e.g., outfall condition, flow, odor, color, oil sheen) on the Outfall Inspection Form.
3. Compare observations to previous inspections.
4. If 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 (groundwater, intermittent stream, etc.)

d. If an illicit discharge (such as raw sewage, petroleum products, paint, etc.) is encountered or suspected, follow the procedure of SOP IDDE - Tracing Illicit Discharges.

3. Cleanup - as necessary

4. Documentation

a. File completed outfall inspection forms.
b. Update maps if new outfalls are observed and inspected.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** IDDE - Removing Illicit Discharges
City of Kingsport, TN	Stormwater Management	Stormwater

IDDE – REMOVING ILLICIT DISCHARGES

1. Preparation

a. Obtain available property ownership information for the source of the illicit discharge.

2. Process

a. Determine who is financially responsible; and follow associated procedures as given below.

For Private Property Owner:
Contact Owner,
Issue Notice of Violation for violations of the municipal ordinance, and
Determine schedule for removal.
For Municipal Facility:
Notify appropriate municipal authority or department head,
Schedule removal, and
Remove illicit connection.

b. Suspend access to storm drain if threats of serious physical harm to humans or the environment are possible.

c. Direct responsible party to initiate repairs/corrections/cleanup. Coordinate with enforcement official for escalating penalties in accordance with the municipal ordinance.

d. Repair/correct cause of discharge if municipality is responsible. Schedule the work through the appropriate municipal authority or department head..

e. Seek technical assistance from the TDEC Water Resources Division, if needed.

3. Clean up

a. Confirm illicit discharge is removed or eliminated by follow-up inspection.

4. Documentation

a. Maintain records of notice of violation and penalties.

b. Document repairs, corrections, and any other actions required.

	S TANDARD **O** PERATING **P** ROCEDURE	***SOP Name:*** IDDE - Tracing Illicit Discharges
City of Kingsport, TN	Stormwater Management	Stormwater

IDDE – TRACING ILLICIT DISCHARGES

1. Preparation

a. Review / consider information collected when illicit discharge was initially identified and document using Incident Tracking Form or Outfall Inspection Form.
b. Obtain storm drain mapping for the area of the reported illicit discharge.
c. Gather all necessary equipment including: tape measure, clear container, clipboard with necessary forms, flashlight, and camera (optional).

2. Process

a. Survey the general area / surrounding properties to identify potential sources of the illicit discharge as a first step.
b. Trace illicit discharges using visual inspections of upstream points as a second step. Use available mapping to identify tributary pipes, catch basins, etc.
c. If the source of the illicit discharge cannot be determined by a survey of the area or observation of the storm drain system, then consider the following additional steps:
    1. Use weirs, sandbags, dams, or optical brightener monitoring traps to collect or pool intermittent discharges during dry weather.
    2. Smoke test or televise the storm drain system to trace high priority, difficult to detect illicit discharges.
    3. Dye test individual discharge points within suspected buildings.
    4. Consider collecting bacterial samples of flowing discharges to confirm/refute illicit discharge.
d. If the source is located, follow SOP IDDE - Removing Illicit Discharges.
e. If the source cannot be found, add the location to a future inspection program.

3. Clean up

a. Clean catch basin, clean storm drain, or initiate spill response, as applicable. Follow relevant SOPs.

4. Documentation

a. Document tracing results for future reference.